



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

UNPROTECTED/NON PROTÉGÉ

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CMD: 20-H4

Date signed/Signé le : 10 SEPTEMBER 2020

A Licence Amendment

Une modification de permis

**Canadian Nuclear
Laboratories Ltd.**

**Laboratoires Nucléaires
Canadiens Ltée**

**Douglas Point Waste
Facility**

**Installation de gestion
des déchets de Douglas
Point**

Commission Public Hearing

Audience publique de la Commission

Scheduled for:
November 25-26, 2020

Prévue pour :
25-26 novembre 2020

Submitted by:
CNSC Staff

Soumise par :
Le personnel de la CCSN

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Summary

This CMD presents information about the following matters of regulatory interest with respect to Canadian Nuclear Laboratories Ltd.:

- Licence amendment to authorize the decommissioning of the Douglas Point Waste Facility

CNSC staff recommend that the Commission take the following actions:

- Make a determination that carrying out the proposed decommissioning activities at the Douglas Point Waste Facility is not likely to cause significant environmental effects in accordance with section 67 of the *Canadian Environmental Assessment Act, 2012*
- Amend the Waste Facility Decommissioning Licence for the Douglas Point Waste Facility to include phase 3 decommissioning activities
- Delegate authority as set out in section 4.7 of this CMD

The following items are attached:

- The proposed licence, WFDL-W4-322.03/2030
- The draft Licence Conditions Handbook
- The current licence, WFDL-W4-332.02/2034
- The Environmental Protection Review Report

Résumé

Le présent CMD comprend de l'information sur un ensemble de questions d'ordre réglementaire concernant les Laboratoires Nucléaires Canadiens Ltée:

- Modification du permis afin d'autoriser le déclassement de l'Installation de gestion des déchets de Douglas Point

Le personnel de la CCSN recommande à la Commission de prendre les mesures suivantes :

- Établir que la réalisation des activités de déclassement proposées à l'Installation de gestion des déchets de Douglas Point n'est pas susceptible d'entraîner d'impacts environnementaux significatifs conformément à l'article 67 de la *Loi canadienne sur l'évaluation environnementale (2012)*
- Modifier le permis de déclassement d'une Installation de traitement des déchets de l'installation de gestion des déchets de Douglas Point afin d'y inclure les activités de la phase 3 du déclassement
- Déléguer les pouvoirs tel que prévu à la section 4.7 du présent CMD

Les pièces suivantes sont jointes :

- Le permis proposé, WFDL-W4-322.03/2030
- L'ébauche du Manuel des conditions de permis
- Le permis actuel, WFDL-W4-332.02/2034
- Le Rapport d'examen de la protection de l'environnement

Signed/signé le

10 September 2020

**Murthy,
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EXECUTIVE SUMMARY

The Douglas Point Waste Facility (DPWF) currently has a decommissioning licence (WFDL-W4-332.02/2034), which was issued on the basis of activities associated with continued storage with surveillance of the facility. Canadian Nuclear Laboratories (CNL) has applied to amend the licence to proceed with some activities under phase 3 decommissioning (decommissioning and dismantlement of all remaining facilities and structures) of the DPWF. The scope of the current request for licence amendment is limited to a discrete set of proposed decommissioning activities that form part of a proposed longer-term, multi-stage, 50-year decommissioning project.

The purpose of this Commission Member Document (CMD) is to provide the results of CNSC staff's assessment of the CNL application, including conclusions and recommendations to inform the Commission decision on CNL's request for a licence amendment. In the assessment of the application, CNSC staff reviewed relevant safety and control areas (SCAs) and took the licensee's past performance into consideration.

Based on this assessment, CNSC staff conclude that CNL has made, and will continue to make, adequate provision for the protection of the environment and the health and safety of persons, and that there will likely be no adverse effects on the health and safety of persons or the environment as a result of the decommissioning activities proposed by CNL at the DPWF.

This conclusion is supported by CNSC staff's Environmental Protection Review (EPR) Report for the DPWF. The EPR Report is attached to this CMD as addendum D.

The proposed decommissioning activities at the DPWF are subject to the federal lands provision of the *Canadian Environmental Assessment Act, 2012 (CEAA 2012)*. In accordance with section 67 of CEAA 2012, the Commission is requested to make a determination on the environmental effects of the proposed decommissioning activities. This determination is required before the Commission can exercise its power under the *Nuclear Safety and Control Act* to authorize a project located on federal lands.

The public, Indigenous peoples and stakeholders were invited to participate in the regulatory licence amendment process. To enable their participation, funding was made available through the CNSC's Participant Funding Program (PFP).

This CMD has two parts. Part one presents CNSC staff's review and assessment of CNL's licence application and a summary of CNL's performance in the operation of the DPWF since 2014. Part two presents CNSC staff's proposed licence and draft licence conditions handbook (LCH).

Referenced documents in this CMD are available to the public upon request.

PART ONE

This Commission Member Document (CMD) is presented in two parts.

Part One includes:

1. An overview of the matter being presented;
2. Overall conclusions and overall recommendations;
3. General discussion pertaining to the safety and control areas (SCAs) that are relevant to this submission;
4. Discussion about other matters of regulatory interest; and
5. Addenda material that complements items 1 through 4.

Part Two provides all available information pertaining directly to the current and proposed licence.

1. OVERVIEW

1.1 Background

The Douglas Point Waste Facility (DPWF) is located in Tiverton, Ontario on the Bruce nuclear site near Kincardine, Ontario. The 200-megawatt electric (MWe) prototype Canada deuterium uranium (CANDU) power reactor was put into service in 1968 and permanently shut down in 1984. The DPWF is comprised of a reactor building, service building, turbine building/administration wing, an area for the storage of concrete canisters filled with irradiated nuclear fuel and several outbuildings. An exterior view of DPWF is shown in Figure 1. The reactor building is the domed structure visible on the left side of the figure. The stack is visible in front of the reactor building. The service building is the low building to the right of the reactor building, largely obstructed by trees, with the turbine building visible behind the service building, above the tree line.

Figure 1: Douglas Point Waste Facility (courtesy of CNL)

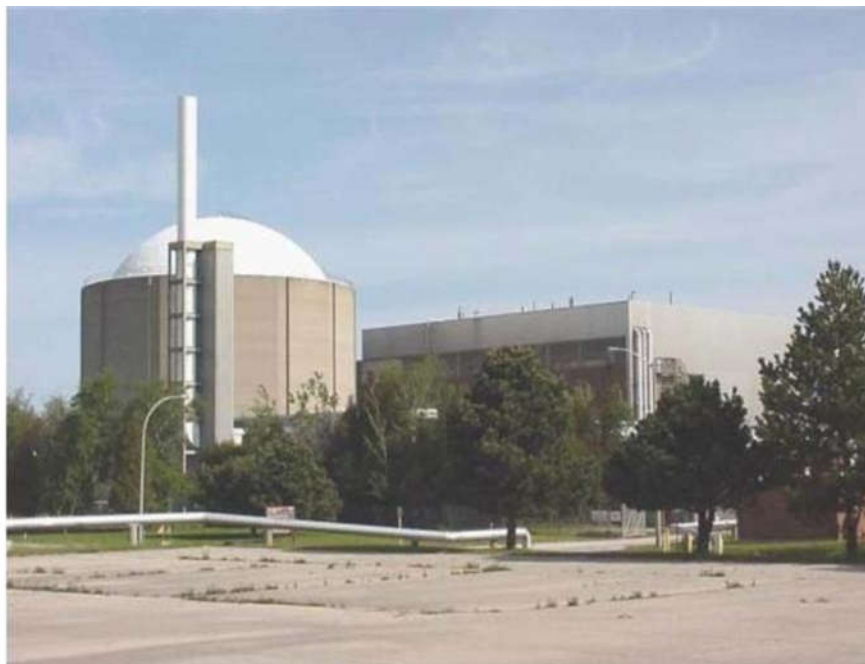
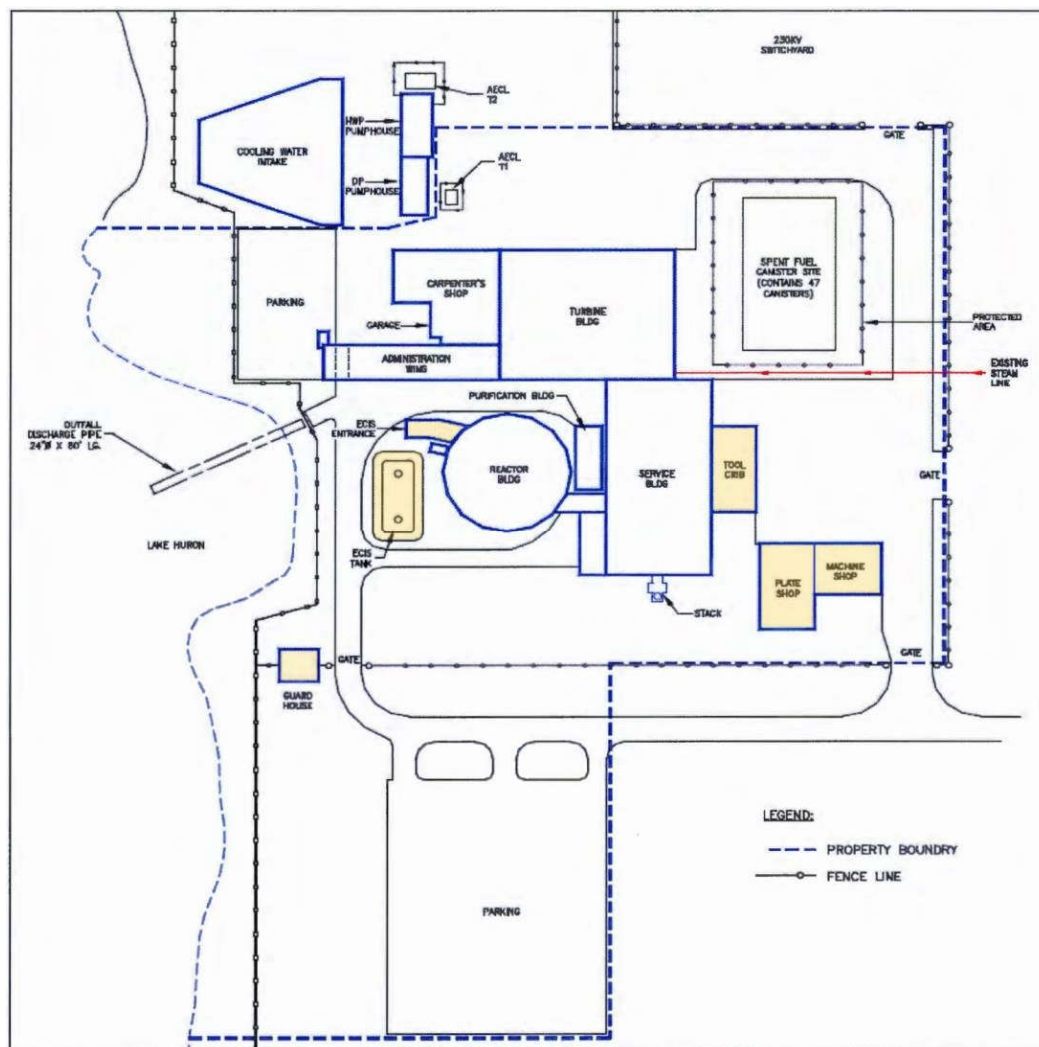


Figure 2 shows the location of the various buildings and facilities at the DPWF. This figure includes the existing structures, as well as a number of buildings that were removed during the current licence period. The buildings that have been removed are highlighted in gold on Figure 2 and listed in Table 2.

Figure 2: Site Plan of the DPWF (courtesy of CNL)



Phased Approach to Deferred Decommissioning of the DPWF

A deferred decommissioning approach was selected for the DPWF following the permanent shutdown of the reactor in 1984. In accordance with this strategy, the decommissioning of the DPWF was planned to occur in three phases. Phase 1, Establishment of a Safe, Sustainable, Shutdown State, involved bringing the facility into a safe state suitable for long-term storage with surveillance. Phase 1 activities focused on reducing the radioactive inventories, removing hazards and implementing monitoring and surveillance systems. Major activities during this phase included defueling and dewatering the reactor, and the construction of a dedicated dry-storage facility for the irradiated fuel. Phase 1 was achieved in 1988.

The DPWF is currently in phase 2, Storage-with-Surveillance. Storage-with-surveillance (SWS) is a long-term storage state intended to allow for radioactive decay. During this phase, the DPWF is monitored and maintained to ensure continued security and safety of retained structures and systems until final decommissioning. In addition to the routine surveillance activities, other work is performed to reduce unnecessary risks and liabilities within the facility. CNL has progressed in the removal of hazardous substances such as asbestos, mercury and polychlorinated biphenyls (PCBs), and reduced the quantity of stored radioactive waste during this phase by physically removing them from the site and transporting them to Chalk River Laboratories. CNL has reduced inventories of low-level radioactive wastes (LLW) stored in the reactor and service building, and retrieved the Heat Transport Purification System (HTPS) and Moderator Purification System (MPS) resins. These resins were volume reduced and sent to Chalk River Laboratories. CNL has also reduced its liabilities on the site through the removal of non-nuclear structures and facilities including the guard house, machine shop, plate shop and tool crib, and the Emergency Coolant Injection system (ECIS) tank and bunker. Progress on these activities was previously reported to the Commission in CMDs 16-M12 [1], 18-M30 [2] and 19-M24 [3].

Phase 3, Final Decommissioning, will involve the decommissioning and dismantlement of all remaining facilities and structures, and will bring the DPWF to its final end state. Phase 3 decommissioning will be performed in a staged manner over approximately 50 years.

Licensing History

In 1994, the Atomic Energy Control Board issued a waste facility operating licence (WFOL) to Atomic Energy of Canada Ltd (AECL) for the DPWF for an indefinite term.

In 2014, AECL applied to replace the WFOL with a single consolidated 20-year term waste facility decommissioning licence (WFDL) covering three prototype reactors: the DPWF, the Gentilly-1 Waste Facility (G1WF) and the Nuclear Power Demonstration Waste Facility (NPDWF). CNSC staff's assessment of this request is documented in CMD 14-H107 [4]. In the associated *Record of Proceedings, Including Reasons for Decision* [5], the Commission stated that the consolidated WFDL solely authorized continued SWS activities, and that AECL would be required to submit detailed decommissioning plans prior to entering active (phase 3) decommissioning.

As a result of the Government of Canada's decision to engage a private-sector contractor to manage operations at AECL-owned properties under a government owned-contractor operated (Go-Co) business model, CNL was established as a wholly-owned subsidiary of AECL in 2014. The consolidated WFDL was subsequently transferred by the Commission to CNL [6].

In 2018, CNL requested the separation of the WFDL into three licences, one for each of the prototype reactors. No changes to the licensed activities or expiry date were requested. CNSC staff's assessment of this request is documented in CMD 18-H107 [7]. In the associated *Record of Decision* [8], the Commission acknowledged that the licence application did not propose any new activities and would not result in changes to the current decommissioning operations at the DPWF, the G1WF and the NPDWF sites. The Commission noted that should CNL seek to accelerate the decommissioning of any of the prototype reactor sites, CNSC staff would submit a full assessment of all relevant safety and control areas for the Commission's consideration at a separate public Commission hearing. The activities proposed by CNL in the current request to amend the DPWF licence generally follow the decommissioning approach as outlined in its existing preliminary decommissioning plan (PDP), however CNL has proposed a reduced timeframe for decommissioning activities and therefore Commission approval is required.

Current Licensing Request

The current DPWF decommissioning licence, WFDL-W4-332.02/2034 [9], was granted on the basis of continued SWS. CNL is now planning on entering an active phase of decommissioning at the DPWF. CNL has submitted an application [10] to amend the licence WFDL-W4-332.02/2034 [9] and the licensing basis to proceed with phase 3 decommissioning at the DPWF.

The licensing matter before the Commission is limited to a discrete set of proposed decommissioning activities that form part of a proposed multi-stage, 50-year decommissioning project. The scope of this request does not include decommissioning of the Spent Fuel Canister Area or the Reactor Building. A separate decision by the Commission will be required before decommissioning the Spent Fuel Canister Area or the Reactor Building.

Environmental Effects Review

The proposed decommissioning activities at the DPWF are subject to the federal lands provision of CEAA 2012. When the federal lands provision of CEAA 2012 applies, CNL is required to conduct Environmental Effects Reviews (EERs) to assess the potential adverse environmental effects of non-routine work and propose mitigation measures to prevent, reduce or control the identified effects. An EER [11] was included as part of CNL's licence amendment application. The scope of this EER was limited to the activities that CNL intends to perform during the current licence period. CNSC staff assessment of this EER is included in an EPR report provided as Addendum D of this CMD.

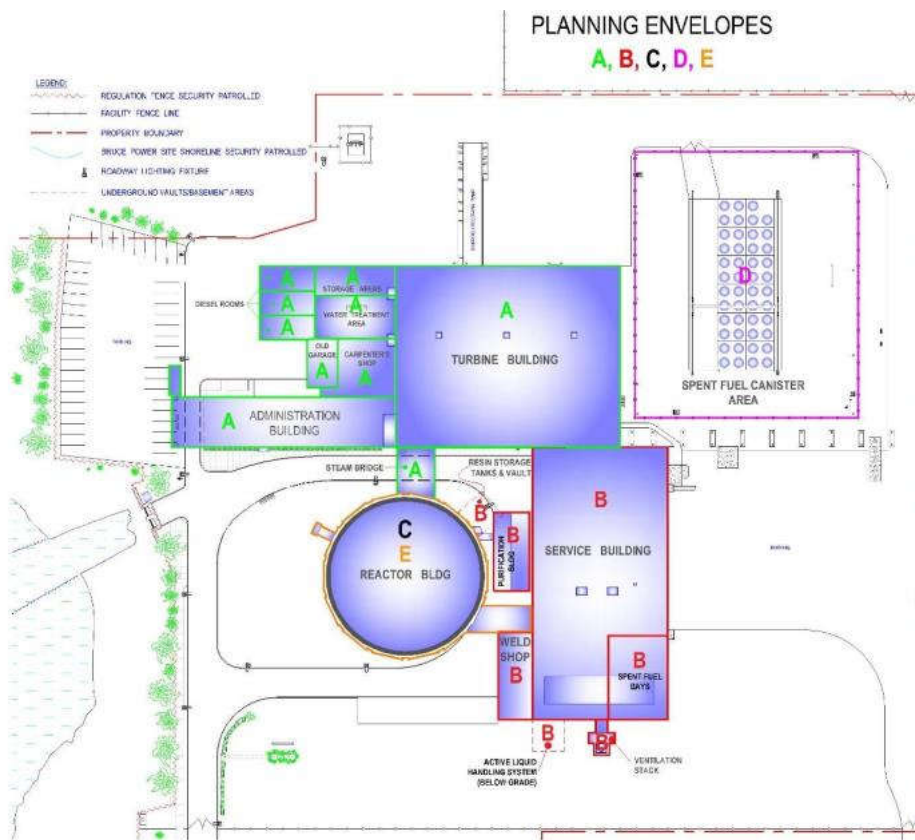
Planning Envelopes (PE)

Phase 3 decommissioning will be performed in a staged manner, defined by five Planning Envelopes (PE). Table 1 describes the scope of work planned for each PE. Figure 3 shows the location of each PE at the DPWF.

Table 1: Scope of Work for Each Planning Envelope

Planning Envelope	Scope of work
A	Decommissioning and demolition of: <ul style="list-style-type: none"> • the Turbine Building, • the Administration Building, • Ancillary Facilities (Carpenter's Shop, Water Treatment Area, Garage, Storage Area, and the Diesel Room), and • the Steam Bridge
B	Decommissioning and demolition of: <ul style="list-style-type: none"> • the Purification Building, • the Service Building (including Ventilation Stack, Fuel Bays, and Active Liquid Handling System), • the Weld Test Shop, and • the Resin Storage Tanks and Vault
C	Reactor Building Clear-out: <ul style="list-style-type: none"> • Decommissioning, dismantlement, and removal of systems and components within the Reactor Building. <p>Note: This does not include the decommissioning of the Reactor, or the Reactor Building itself.</p>
D	Decommissioning and demolition of: <ul style="list-style-type: none"> • the Spent Fuel Canister Area
E	Decommissioning, dismantlement, and removal of: <ul style="list-style-type: none"> • the Reactor, and <p>Decommissioning and demolition of:</p> <ul style="list-style-type: none"> • the Reactor Building

Figure 3: Douglas Point Waste Facility Planning Envelopes (courtesy of CNL)



The first three PEs (A, B and C) define the scope of work that CNL intends to complete during the current licence period. The scope of the EER report submitted by CNL as part of its application reflects this intention and includes only PEs A, B and C.

The last two PEs (D and E) are not included in the EER. CNL intends that these activities will be deferred until a permanent waste disposal facility for intermediate and high-level waste is available in Canada. Additional EER(s), and subsequent approval by the Commission, would be required to proceed with the decommissioning activities related to PEs D and E.

Program Overview Detailed Decommissioning Plan

As discussed above, decommissioning of the DPWF covers many different activities, which will be conducted over approximately 50 years. Because of the length and complexity of the project, CNL proposes to provide the documentation in stages, organized by PEs, and beginning with the lower risk non-nuclear facilities. The Program Overview Detailed Decommissioning Plan (DDP) provided with CNL's application specifies the structure of the decommissioning program at the DPWF and outlines the basic approach for the site. In addition to this, a discrete DDP is required for each PE. In order to develop DDPs for each PE, CNL must first conduct characterization surveys and safety assessments in order to establish the hazards and mitigation measures, as appropriate to ensure the safety of workers and the environment. Individual DDPs covering every PE will be developed, and submitted to the CNSC for review and acceptance, prior to executing the planned decommissioning work. The composite of these documents will form the entire DDP for the DPWF.

A similar staged approach for the development of several component DDPs, as outlined in an overview DDP, was accepted by the Commission for CNL's Whiteshell Laboratories [12].

Proposed Decommissioning Schedule

The schedule outlined in the Program Overview DDP shortens the decommissioning timeframe of several facilities/structures at the DPWF versus those in the 2016 PDP. This advancement in schedule is aligned with *Canadian Nuclear Laboratories Integrated Waste Strategy*, which focuses on reducing radioactive and nonradioactive waste and decommissioning liabilities across CNL sites. Table 2 provides a comparison to the schedule outlined in the 2016 PDP and that of the Program Overview DDP.

Table 2: Decommissioning Timelines

Facility / Structure	2016 Preliminary Decommissioning Plan	Program Overview Detailed Decommissioning Plan	Shortened Decommissioning Timeframe
Hazard reduction work (completed during phase 2)			
Guardhouse	2016	Complete	
Plate Shop	2021-2024	Complete	
Tool Crib	2021-2024	Complete	
Machine Shop	2021-2024	Complete	
ECIS Tank	2021-2024	Complete	
ECIS Bunker	2021-2024	Complete	
Planning Envelope A (non-nuclear buildings and structures)			
Carpenters shop and garage	2025-2029	2021-2024	5 years
Turbine Building	2025-2029	2021-2024	5 years
Administrative Building	2025-2029	2021-2024	5 years
Steam Bridge*	2021-2029	2021-2024	5 years
Ancillary Facilities*	2021-2029	2021-2024	5 years
Planning Envelope B (nuclear buildings and structures)			
Weld Test Shop*	2021-2029	2023-2024	5 years
Service Building	2055-2070	2023-2024	46 years
Purification Building	2055-2070	2023-2024	46 years
Resin Storage Tanks and Vault	2055-2070	2023-2024	46 years
Planning Envelope C (clear-out of equipment in the reactor building outside of the bio-shield)			
Reactor Building Clear-out	2055-2070	2022-2029	41 years
Planning Envelope D (outside of current licence request)			
Spent Fuel Canister Area	2055-2070	2035-2070	0 years
Planning Envelope E (outside of current licence request)			
Reactor Building	2055-2070	2035-2070	0 years

*Specific timing for these items was not explicitly indicated in the PDP, but these items were part of the non-nuclear buildings to be decommissioned between 2021-2029.

The most significant advancement in timelines are those for the nuclear structures and facilities, other than the Spent Fuel Canister Area and Reactor Building. Dose estimates for this work must be submitted to the CNSC as part of the DDP for each PE. The completion dates for the Spent Fuel Canister Area and the Reactor Building have not been advanced.

1.2 Highlights

The purpose of this CMD is to provide to the Commission the results of CNSC staff's assessment of CNL's application to proceed with phase 3 decommissioning at the DPWF. This CMD provides CNSC staff's conclusions and recommendations to inform the Commission decision on the licence application. CNSC staff's assessment of the application takes into consideration the results of CNSC staff's compliance verification activities, CNL's operational performance history and information submitted by CNL in support of the application.

CNSC staff have prepared a proposed licence that uses the standard format and incorporates the standard licence conditions applicable to the DPWF. CNL has not requested any change to the licence period. However, CNSC staff recommend that the licence period be aligned with the proposed activities by revising the expiration date of the licence to December 31, 2030. This aligns with the timeline presented in CNL's Program Overview DDP for decommissioning of PEs A, B, and C. For additional information on this recommendation, refer to Part 2, Proposed Licence Changes, of this CMD.

This CMD provides a summary of CNSC staff's review of SCAs relevant to this application.

1.3 Overall Conclusions

CNSC staff conclude the following with respect to paragraphs 24(4)(a) and (b) of the *Nuclear Safety and Control Act* (NSCA) [13], in that the licensee:

1. Is qualified to carry on the activity that the licence will authorize the licensee to carry on.
2. Will, in carrying out that activity, make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

CNSC staff have also determined, in accordance with section 67 of the CEEA 2012 [14], that the carrying out of the proposed project is not likely to cause significant adverse environmental effects.

1.4 Overall Recommendations

CNSC staff recommend that the Commission:

1. Make a determination that carrying out the proposed decommissioning activities at the DPWF is not likely to cause significant environmental effects in accordance with section 67 of the CEAA 2012
2. Amend the Waste Facility Decommissioning Licence as per the proposed licence attached to this CMD
3. Delegate authority as set out in section 4.7 of this CMD

2. MATTERS FOR CONSIDERATION

2.1 Environmental Assessment

The proposed decommissioning activities at the DPWF are subject to the federal lands provision of CEAA 2012 because:

- They do not constitute a designated project as per the *Regulations Designating Physical Activities* under CEAA 2012
- They are considered a “project” under section 66 of CEAA 2012, i.e. physical activities proposed to be carried out on federal lands in relation to a physical work
- They require a decision by the CNSC as a federal authority (i.e., the issuance of a licence amendment)
- They have not been exempted under section 70 of CEAA 2012 (e.g., for matters of national security or national emergency)

Given that all above conditions apply, the Commission is responsible for determining whether carrying out the proposed decommissioning activities at the DPWF is likely to cause significant adverse environmental effects in accordance with section 67 of CEAA 2012. This determination is required before the Commission can exercise its power under the NSCA to authorize a project located on federal lands.

CNL’s licence amendment application was received on July 18, 2019. This was prior to August 28, 2019, when CEAA 2012 was repealed and replaced by the *Impact Assessment Act*. The requirements of CEAA 2012 apply as the application was received, and the review initiated, when this legislation was still in effect.

CNSC staff have determined, in accordance with section 67 of the CEAA 2012, that the carrying out of the proposed project is not likely to cause significant adverse environmental effects. Addendum D of this CMD provides an EPR Report. The EPR is a science-based environmental technical assessment by CNSC staff of CNL’s application for the licence amendment to proceed with phase 3 decommissioning at the DPWF. CNSC staff conclude that the licensee has, and will, continue to make adequate provision for the protection of the environment and health of persons.

2.2 Relevant Safety and Control Areas (SCAs)

The functional areas of any licensed facility or activity consist of a standard set of safety and control areas (SCAs). See Addendum C, “Safety and Control Framework”, for further information about SCAs.

The CNSC uses a risk-informed regulatory approach in the management and control of regulated facilities and activities. The depth of regulatory reviews of each SCA and the baseline frequency of regulatory compliance activities are established by the potential risk associated with the activities to be authorized.

For the purpose of this application, CNSC staff considered the following SCAs as they relate specifically to phase 3 decommissioning of the DPWF:

- Radiation Protection
- Conventional Health and Safety
- Environmental Protection
- Waste Management
- Packaging and Transport

These SCAs are discussed in Section 3 of this CMD.

Increased work in radiological zones and on potentially contaminated equipment will occur during decommissioning and therefore the Radiation Protection SCA is relevant to this licence request. Conventional Health and Safety SCA is included as conventional hazards are present during the demolition of structures and the handling and removal of hazardous substances. The Environmental Protection SCA ensures that the existing monitoring programs are sufficient to capture unplanned releases to the environment that may result from the proposed activities and is also relevant to the federal lands review under section 67 of CEAA 2012. The Waste Management SCA includes decommissioning, which is the primary subject of this licence request. The inclusion of the Packaging and Transport SCA acknowledges an expected increase in the frequency of dangerous goods shipments from the site.

All other SCAs are relevant in the broader context of the facility and are assessed through ongoing oversight activities. The baseline compliance program provides assurance that all SCAs remain satisfactory during the entire life cycle of the facility, including decommissioning.

In the following table:

1. The relevance of each SCA to this CMD is indicated.
2. The rating level for each relevant SCA indicates the overall compliance with regulatory requirements for implementation (refer to Addendum B, “Rating Levels”).

Table 3: Relevant SCAs

Functional Area	Safety and Control Area	Relevant to this CMD?	Rating Level 2014-2019
Management	Management System	No	SA
	Human Performance Management	No	SA
	Operating Performance	No	SA
Facility and Equipment	Safety Analysis	No	SA
	Physical Design	No	SA
	Fitness for Service	No	SA
Core Control Processes	Radiation Protection	Yes	SA
	Conventional Health and Safety	Yes	SA
	Environmental Protection	Yes	SA
	Emergency Management and Fire Protection	No	SA
	Waste Management	Yes	SA
	Security	No	SA
	Safeguards and Non-Proliferation	No	SA
	Packaging and Transport	Yes	SA

As outlined in Table 4, the current DPWF decommissioning licence requires that CNL implement a wide range of programs, which are related to each SCA. CNL utilizes corporate-wide programs that apply at all the sites they operate. No changes to these programs are proposed in order to proceed with phase 3 decommissioning at the DPWF. This suite of corporate-wide programs has been used to safely conduct decommissioning activities at this and other CNL sites, including Chalk River Laboratories and Whiteshell Laboratories.

Table 4: Program Requirements in the Current DPWF Decommissioning Licence

Safety and Control Area	Requirements in the existing licence
Management System	CNL has implemented a management system in accordance with licence condition 3.1 of the current licence.
Human Performance Management	CNL has implemented a human performance management program and a training program in accordance with licence conditions 4.1 and 4.2 of the current licence.
Operating Performance	CNL has implemented a process for reporting to the Commission in accordance with licence condition 5.1 of the current licence.
Safety Analysis	CNL maintains a safety analysis program in accordance with licence condition 6.1 of the current licence.
Physical Design	CNL has implemented a physical design program in accordance with licence condition 7.1 of the current licence.
Fitness for Service	CNL has implemented a fitness for service program in accordance with licence condition 8.1 of the current licence.
Radiation Protection	CNL has implemented a radiation protection program in accordance with licence condition 9.1 of the current licence.
Conventional Health and Safety	CNL has implemented a conventional health and safety program in accordance with licence condition 10.1 of the current licence.
Environmental Protection	CNL has implemented an environmental protection program in accordance with licence condition 11.1 of the current licence.

Emergency Management and Fire Protection	CNL has implemented an emergency preparedness and response program and fire protection program in accordance with licence conditions 12.1 and 12.2 of the current licence.
Waste Management	CNL has implemented a waste management program and decommissioning program in accordance with licence conditions 13.1 and 13.2 of the current licence.
Security	CNL has implemented a security program in accordance with licence condition 14.1 of the current licence.
Safeguards and Non-Proliferation	CNL has implemented a safeguards program in accordance with licence condition 15.1 of the current licence.
Packaging and Transport	CNL has implemented a packaging and transport program in accordance with licence condition 16.1 of the current licence.

2.3 Other Matters of Regulatory Interest

The following table identifies other matters that are relevant to this CMD.

Table 5: Other Matters of Regulatory Interest

OTHER MATTERS OF REGULATORY INTEREST	
Area	Relevant to this CMD?
Indigenous Consultation	Yes
Other Consultation	Yes
Cost Recovery	Yes
Financial Guarantees	Yes
Improvement Plans and Significant Future Activities	No
Licensee's Public Information Program	Yes
Nuclear Liability Insurance	Yes

The relevant “other matters” of regulatory interest are discussed in section 4.

2.4 Regulatory and Technical Basis

The regulatory and technical bases for the matters discussed in this CMD are provided in Addendum B to this document.

3. GENERAL ASSESSMENT OF SCAS

The overall performance ratings is based on field inspections and desktop assessments of the reports submitted by the licensee. As well, in order to make its recommendations to the Commission CNSC staff assessed the documents submitted by the licensee as part of the application.

3.1 Radiation Protection

The radiation protection SCA covers the implementation of a radiation protection program in accordance with the *Radiation Protection Regulations*. The program must ensure that contamination levels and radiation doses received by individuals are monitored, controlled and maintained As Low As Reasonable Achievable (ALARA).

3.1.1 Trends

The following table indicates the overall rating trends for the Radiation Protection SCA over the current licensing period:

RATING LEVEL TRENDS FOR RADIATION PROTECTION					
Overall Compliance Ratings					
2014	2015	2016	2017	2018	2019
SA	SA	SA	SA	SA	SA
Comments CNSC staff continue to rate the radiation protection SCA at the DPWF as “satisfactory”.					

3.1.2 Discussion

CNL has implemented its corporate radiation protection (RP) program at the DPWF in accordance with licence condition 9.1 of the current licence. The RP program meets the requirements of the *Radiation Protection Regulations*. CNL manages radiological exposure of workers through controls stipulated in its RP program, as well as operational control measures defined through its corporate work permit system and ALARA processes.

A review of past performance in radiation protection, during the period from 2014 to 2019, demonstrates that CNL is effectively controlling worker exposures at the DPWF. Radiation doses to Nuclear Energy Workers (NEWs) have been well below the CNSC’s regulatory effective dose limits of 50 mSv per one-year dosimetry period, and 100 mSv per five-year dosimetry period. The maximum annual individual effective dose received by a NEW over this period was 0.43 mSv.

CNL has not had any radiological occurrences that led to an action level being reached or exceeded during the current licence period. In accordance with the guidance provided for licence condition 9.2 in the current LCH, CNL conducted a periodic review of the current radiological protection action levels in December 2019. This review considered the proposed decommissioning activities at the DPWF. As a result of this review, CNL has proposed a new set of action levels for parameters including whole body, skin, and internal worker doses. The revised action levels are more conservative than the existing ones. CNSC staff reviewed the revised action levels and found that they meet regulatory requirements.

In the *Douglas Point Waste Facility Detailed Decommissioning Plan Volume 1: Program Overview* [15], CNL commits to continue to adhere to all RP program requirements during phase 3 decommissioning activities in accordance with its approved RP program. As a part of decommissioning planning of each PE, CNL will conduct characterization surveys followed by safety assessments to determine the occupational doses to the workers along with the mitigation measures, if needed. CNSC staff will assess the DDPs for each PE prior to authorizing the work to proceed. This assessment will verify that sufficient detail has been provided on radiological characterization, work activities and the corresponding worker dose estimates. The licensee will be expected to have in place RP measures commensurate with the planned work in conformance with the requirements of the *Radiation Protection Regulations* and CNL's RP program.

3.1.3 Conclusion

Based on CNSC staff's assessment of CNL's application, supporting documents and past performance, CNSC staff conclude that CNL continues to implement and maintain an effective RP program at the DPWF in accordance with regulatory requirements. This RP program is adequate to support the proposed decommissioning activities. CNSC staff will continue to monitor CNL's performance in this SCA through regulatory oversight activities including inspections and reviews of relevant program documentation. CNSC staff acceptance of DDPs for each PE will be granted only if CNL demonstrates to CNSC staff's satisfaction that appropriate RP measures will be implemented while undertaking the work.

3.2 Conventional Health and Safety

The Conventional Health and Safety SCA relates to the implementation of a program to manage workplace safety hazards and to protect workers.

3.2.1 Trends

The following table indicates the overall rating trends for the Conventional Health and Safety SCA over the current licensing period:

RATING LEVEL TRENDS FOR CONVENTIONAL HEALTH AND SAFETY					
Overall Compliance Ratings					
2014	2015	2016	2017	2018	2019
SA	SA	SA	SA	SA	SA
Comments CNSC staff continue to rate the Conventional Health and Safety SCA at the DPWF as “satisfactory”.					

3.2.2 Discussion

CNL has implemented and maintains a conventional health and safety (CH&S) program to manage workplace safety hazards and to protect personnel and equipment in accordance with licence condition 10.1 of the current licence.

In addition to the NSCA [13] and its associated regulations, CNL’s activities must comply with Part II: Occupational Health and Safety of the Canada Labour Code, its *Canada Occupational Health and Safety Regulations*, and other applicable federal and provincial health and safety acts and regulations.

CNL’s corporate-wide CH&S program applies to all work performed by CNL employees, as well as to work performed by others at the DPWF. It is anticipated that contractors will perform decommissioning demolition work at the DPWF during the current licence period. CNL’s CH&S program requires that contractors demonstrate adequate conventional CH&S programs of their own.

During the current licence period, CNL has safely completed storage with surveillance activities, hazard reduction campaigns, and removal of non-nuclear buildings.

The nature of the proposed activities related to decommissioning at the DPWF make CH&S an important program for this site. Significant non-radiological (chemical, industrial, biological and environmental) hazards will be present during execution of the proposed decommissioning activities. Mitigating measures to limit the risk of these hazards have been identified in CNL’s Program Overview DDP, and will be incorporated into subsequent DDPs for each PE and related work packages as appropriate.

3.2.3 Conclusion

Based on CNSC staff's assessment of CNL's application, supporting documents and past performance, CNSC staff conclude that CNL continues to implement and maintain an effective CH&S program at the DPWF in accordance with regulatory requirements. This existing program is capable of safely supporting the activities outlined in CNL's licence amendment application. CNSC staff will continue to monitor CNL's performance in this SCA through regulatory oversight activities including inspections and reviews of relevant program documentation. CNSC staff acceptance of DDPs for each PE will be granted only if CNL demonstrates to CNSC staff's satisfaction that appropriate CH&S measures will be implemented while undertaking the work.

3.3 Environmental Protection

The Environmental Protection SCA covers programs that identify, control and monitor all releases of radioactive and hazardous substances and effects on the environment from facilities or as the result of licensed activities.

3.3.1 Trends

The following table indicates the overall rating trends for the Environmental Protection SCA over the current licensing period:

TRENDS FOR ENVIRONMENTAL PROTECTION					
Overall Compliance Ratings					
2014	2015	2016	2017	2018	2019
SA	SA	SA	SA	SA	SA
Comments CNSC staff continue to rate the environmental protection SCA at the DPWF as "satisfactory". The environmental releases from the facility are small and present negligible risk. There have been no releases to the environment that would pose a risk to the public or the environment.					

3.3.2 Discussion

CNL has implemented and maintained an Environmental Protection Program at the DPWF in accordance with licence condition 11.1 of the current licence.

Based on the requirements of, and in compliance with, CSA N288.5 *Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills*, CNL has developed and implemented an Effluent Monitoring Plan at the DPWF.

In 2015, CNL revised the derived release limits (DRLs) for the DPWF, based on CSA N288.1-08, *Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities*, to ensure that the releases of radionuclides from the facility's activities (e.g., SWS activities, hazard reduction campaigns, and removal of non-nuclear buildings) would not exceed the established regulatory limit of 1 mSv/yr. These DRLs apply to emissions of both airborne and liquid effluents during normal operation, and supersede the DRL values established in 2004.

CNL has submitted an Environmental Risk Assessment (ERA) as part of this licence amendment application.

Additional information is presented in Addendum D, Environmental Protection Review Report, of this CMD.

Effluent and emissions controls (releases)

CNL has implemented and maintained an Effluent Verification Monitoring Plan at the DPWF compliant with CSA N288.5-11, *Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills*. This program consists of monitoring airborne and waterborne releases of radiological and hazardous substances from the facility.

As per CNSC reporting requirements, CNL provides the results of its effluent monitoring in an annual report. CNSC staff review these reports to confirm compliance with the applicable regulations.

CNSC staff review of CNL's annual reports for the DPWF (2014 to 2019) indicates that all radiological releases from the facility were well below (generally less than 0.01%) its respective DRLs.

CNSC staff conclude that the effluent monitoring plan in place for DPWF continues to provide adequate protection of the environment and the public.

Assessment and Monitoring

In 2016, CNL conducted a gap analysis against CSA N288.4, *Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills*, and determined that given the very low levels of contaminants in airborne and waterborne effluents, there was no regulatory requirement for an Environmental Monitoring Program at the DPWF. CNSC staff reviewed and accepted this gap analysis.

Protection of the public

The environmental protection program at the DPWF must ensure that members of the public are not exposed to "unreasonable" risk with respect to non-radiological hazardous substances discharged from the nuclear facilities.

In accordance with the federal *Canadian Environmental Protection Act, 1999*, CNL conducts annual checks at the DPWF against the National Pollutant Release Inventory (NPRI) and the Greenhouse Gas Emissions reporting requirements. CNL also monitors and reports any losses of halocarbon refrigerants and fire suppressants over 10 kg, in compliance with the *Federal Halocarbon Regulations*, to Environment and Climate Change Canada (ECCC).

CNSC staff review of the results of CNL's reported hazardous substances monitoring for the DPWF (2014 to 2019) found that the DPWF did not exceed the reporting thresholds for any hazardous substances during the current licence period.

CNSC staff conclude that the hazardous substances monitoring plan in place for the DPWF continues to provide adequate protection of the environment and the public.

Environmental Risk Assessment

In accordance with REGDOC-2.9.1, *Environmental Protection: Environmental Protection Policies, Programs and Procedures (2017)*, and CSA N288.6, *Environmental Risk Assessment at Class I Nuclear Facilities and Uranium Mines and Mills*, CNL has prepared an ERA for the current SWS phase of the DPWF decommissioning project. The DPWF is located within the boundaries of the Bruce Power (BP) site and therefore emissions from the DPWF are reflected in the overall site emissions. As such, CNL has largely relied on the information provided in the BP ERA. Through review of the DPWF ERA, CNSC staff conclude that there is no unreasonable risk to human health or the environment from exposure to radionuclides, hazardous substances, or physical stressors associated with current SWS phase of the DPWF decommissioning project. More information on CNSC staff's review of the ERA can be found in section 2.3.1 of the EPR report found in addendum D of this CMD.

Independent Environmental Monitoring Program

To complement ongoing compliance activities, the CNSC has implemented its Independent Environmental Monitoring Program (IEMP). The DPWF is located within the boundaries of the BP site. The IEMP results around the BP site indicate that the public and the environment in the vicinity of the DPWF are protected. CNSC staff conducted IEMP sampling near the BP site in 2013, 2015, 2016, and 2019. The IEMP report for the BP site is published on the CNSC's website <http://www.nuclearsafety.gc.ca/eng/resources/maps-of-nuclear-facilities/iemp/bruce.cfm>.

3.3.3 Conclusion

Based on CNSC staff assessment of CNL's application, supporting documents and past performance, CNSC staff conclude that CNL continues to implement and maintain an effective environmental protection program at the DPWF in accordance with regulatory requirements.

3.4 Waste Management

The Waste Management SCA covers internal waste-related programs that form part of the facility's operations up to the point where the waste is removed from the facility to a separate waste management facility. This SCA also covers the planning for decommissioning.

3.4.1 Trends

The following table indicates the overall rating trends for the Waste Management SCA over the current licensing period:

TRENDS FOR WASTE MANAGEMENT					
Overall Compliance Ratings					
2014	2015	2016	2017	2018	2019
SA	SA	SA	SA	SA	SA
Comments					
The licensee maintains an adequate Waste Management Program that has been satisfactory over the licence period.					

3.4.2 Discussion

The Waste Management SCA includes a waste management program and a plan for the decommissioning of the DPWF. CNL has implemented a waste management program and decommissioning program in accordance with licence conditions 13.1 and 13.2 of the current licence. The waste management program documents the activities to control the safe management of radioactive waste during all stages of its management. CNL prepared a Program Overview DDP that describes the decommissioning strategy and final planned end-state.

Waste Characterization

CNL has processes and procedures in place to characterize waste at the various steps in the management of radioactive waste to meet acceptance criteria of the receiver.

A number of non-nuclear structures and facilities were removed during the current licence period in order to reduce the hazards and liabilities present at the DPWF in accordance with the approved DDPs. Several characterization reports related to the DPWF were submitted to CNSC staff for their review during the current licence period. This includes characterization reports for resin sampling, the ECIS tank, and the ECIS bunker. CNSC staff confirmed, through desktop review of these documents, that adequate characterization was taking place in advance of decommissioning activities.

Waste Minimization

CNL maintains a waste management program to control and minimize the volume for all waste streams of waste generated from licensed activities. Waste generated at the DPWF is radiologically screened and segregated at the source as either “Potentially Clearable Waste”, “Radioactive Waste”, or “Hazardous Waste”. Potentially Clearable Waste is monitored for radiological clearance. If the waste is confirmed clean (i.e. not radiologically contaminated), the waste is either dispositioned for reuse or recycling where possible, or transferred to an off-site landfill. Radioactive Waste is decontaminated to meet clearance criteria where feasible or characterized and sent to an appropriate off-site waste management facility for processing, storage or disposal. Hazardous Waste, such as asbestos containing material, lead, PCBs, mercury, and silica, is transferred to an appropriate storage or process facility for hazardous material.

Waste Management Practices

CNL is executing the decommissioning of the DPWF in accordance with approved building-specific DDPs. The building-specific DDPs include the proposed waste management practices and are evaluated and accepted by CNSC staff. Following the completion of decommissioning of a building or structure, the licensee is required to submit a post-decommissioning report called the end-state report to the CNSC. CNL has captured the end-state information in an interim end-state report for the DPWF, which was updated in 2016. This report was reviewed by CNSC staff to verify licensee’s compliance with the approved plans.

Decommissioning Plans

CNL has a PDP for the DPWF. During the current licence period, CNL has updated the PDP to reflect changes in the facility and the decommissioning strategy for the DPWF. The PDP was last revised and submitted to CNSC staff in 2016. If the proposed licence amendment is accepted by the Commission, the PDP will be superseded by CNL’s Program Overview DDP [15] that was submitted to the CNSC in support of its application.

A number of non-nuclear structures and facilities were removed during the current licence period in order to reduce the hazards and liabilities present at the DPWF in accordance with the approved building-specific DDPs. Building-specific DDPs were prepared by CNL for the decommissioning of the following structures:

- the guardhouse;
- the machine shop, plate shop and the tool crib building;
- the ECIS tank; and
- the ECIS bunker.

CNSC staff reviewed these building-specific DDPs against the requirements of CSA N294-09, *Decommissioning of Facilities Containing Nuclear Substances*, and elements of G-219, *Decommissioning Plan for Licensed Activities*, prior to accepting them for implementation.

CNL submitted a Program Overview DDP in support of its application. This DDP outlines the strategic approach for the decommissioning process. CNL will prepare and submit individual DDPs for each of the PEs identified in the Program Overview DDP for CNSC staff review and acceptance.

CNL will prepare characterization reports in advance of the preparation of the DDPs for each PE. These characterization reports document the radiological, chemical and industrial condition of the relevant facilities and structures. Detailed work plans will also be prepared to document the work to be performed, as well as the waste management, quality assurance and radiation protection required to achieve the described work scope. CNSC staff will review characterization reports and detailed work plans to ensure continued compliance with regulatory requirements.

3.4.3 Conclusion

Based on CNSC staff assessment of CNL's application, supporting documents and past performance, CNSC staff conclude that CNL continues to implement and maintain an effective waste management program at the DPWF in accordance with regulatory requirements. This program is adequate to support the activities proposed in CNL's licence amendment application.

3.5 Packaging and Transport

The Packaging and Transport SCA covers the safe packaging and transport of nuclear substances to and from the licensed facility.

3.5.1 Trends

The following table indicates the overall rating trends for the Packaging and Transport SCA over the current licensing period:

RATING LEVEL TRENDS FOR PACKAGING AND TRANSPORT					
Overall Compliance Ratings					
2014	2015	2016	2017	2018	2019
SA	SA	SA	SA	SA	SA
Comments					
CNSC staff continue to rate the Packaging and Transport SCA at the DPWF as "satisfactory".					

3.5.2 Discussion

The proposed decommissioning activities at the DPWF are likely to lead to an increase in the number of shipments originating from the DPWF. These shipments must be made in accordance with CNL's approved packaging and transport program.

CNL has implemented a packaging and transport program in accordance with licence condition 16.1 of the current licence. CNL's packaging and transport program is compliant with the *Packaging and Transport of Nuclear Substances Regulations, 2015* and the *Transportation of Dangerous Goods Regulations* for all shipments to and from the DPWF. This program covers elements of package design, package maintenance, and the registration for use of certified packages as required by the regulations.

Shipment of radioactive material is anticipated to be limited to LLW and Intermediate Level Waste (ILW). No shipments of irradiated fuel is expected during the current licence period.

3.5.3 Conclusion

Based on CNSC staff's assessment of CNL's application, supporting documents and past performance, CNSC staff conclude that CNL implements and maintain an effective packaging and transport program at the DPWF in accordance with regulatory requirements. This existing program is capable of safely supporting the activities outlined in CNL's licence amendment application. CNSC staff will continue to monitor CNL's performance in this SCA through regulatory oversight activities including inspections and reviews of relevant program documentation.

4. OTHER MATTERS OF REGULATORY INTEREST

4.1 Indigenous Consultation

The CNSC is committed to meaningful engagement and consultation with Indigenous groups who have an interest in CNSC regulated facilities and activities. The CNSC ensures that all of its licensing decisions under the NSCA [13] uphold the honour of the Crown and consider Indigenous peoples' potential or established Indigenous and/or treaty rights pursuant to section 35 of the *Constitution Act, 1982* [16].

4.1.1 Discussion

CNSC staff have identified the First Nation and Métis groups who may have an interest in the proposed licence amendment for CNL's decommissioning activities at the DPWF in Tiverton, Ontario. These groups include the Historic Saugeen Métis (HSM), the Métis Nation of Ontario (MNO), and the Saugeen Ojibway Nation (SON), representing the Chippewas of Saugeen First Nation and the Chippewas of Nawash Unceded First Nation.

These groups were identified due to the proximity of their communities, treaty areas and/or traditional territories to the DPWF, or due to previously expressed interest in being kept informed of CNSC licensed activities occurring in or proximal to their territories.

CNSC staff sent letters of notification in October 2019 and an update via email in February 2020 to the Indigenous groups identified above, providing information regarding the proposed licence amendment application, the availability of participant funding to facilitate participation in the regulatory process, and details on how to participate in the Commission's public hearing process. Follow-up phone calls were conducted with the identified groups in February 2020 to ensure they had received the letters and to answer any questions about the licence amendment application.

In March 2020, CNSC staff met with MNO and HSM in Southampton to provide more information on the proposed project and consultation activities, as well as to listen to any specific concerns these groups may have with the proposed decommissioning activities. A meeting with the SON leadership was originally scheduled for March 2020, but is currently being rescheduled in light of the ongoing COVID-19 pandemic. Throughout the pandemic, CNSC staff have maintained open lines of communication and moved to conducting consultation activities virtually with communities.

All of the identified Indigenous groups have been encouraged to participate in the regulatory review process and in the public hearing to advise the Commission directly of any concerns they may have in relation to this licence application. To date, the identified Indigenous groups have not expressed any specific concerns with regards to the licence amendment application. However, CNSC staff will provide additional information with regards to on-going consultation activities, including any concerns expressed by Indigenous groups, to the Commission and the public in CNSC staff's presentation to the Commission or a supplemental CMD, where appropriate.

CNSC REGDOC-3.2.2, *Indigenous Engagement*, published in February 2016 (updated in August 2019), sets out requirements and guidance for licensees whose proposed projects may raise the Crown's duty to consult. While the CNSC cannot delegate its obligation, it can delegate procedural aspects of the consultation process to licensees, where appropriate. The information collected and measures proposed by licensees to avoid, mitigate, or offset potential adverse impacts from the proposed licence amendment may be used by CNSC in meeting its consultation obligations.

Based on CNSC staff's review of the information provided by CNL to date, the risks of potential impacts as a result of the licence amendment application are low. If approved, the activities that will be undertaken by CNL will result in an overall reduction in the hazards on the site and removal of contaminated waste from the region. However, as CNL is proposing new activities that could have a potential interaction with the environment and Indigenous interests, CNSC staff determined that REGDOC-3.2.2 would apply to this licence amendment. In accordance with REGDOC-3.2.2, CNL prepared an Indigenous Engagement Report, which includes a list of Indigenous groups identified for engagement, a summary of any Indigenous engagement activities conducted to date, and a description of planned Indigenous engagement activities. Progress against this plan was and continues to be monitored by CNSC staff through monthly update meetings with CNL.

In addition, CNL is required to provide a final Indigenous Engagement Report as part of its CMD submission for the licence amendment to the Commission and the public. To date, CNSC staff are satisfied with CNL's approach to Indigenous engagement, which is in accordance with the requirements and guidance of REGDOC 3.2.2. CNSC staff encourage CNL staff to continue working with the identified groups throughout the proposed licensing term to ensure that they continue to build relationships, provide regular updates on CNL activities, and address concerns on an ongoing basis.

4.1.2 Conclusion

The CNSC ensures that all of its licensing decisions under the NSCA [13] uphold the honour of the Crown and consider the broader interests of Indigenous peoples who exercise Indigenous and/or treaty rights in proximity to CNSC-regulated activities or facilities. Although the risks of potential impacts on the environment and Indigenous interests are low, CNSC staff conducted consultation activities with the identified Indigenous groups to ensure their full participation in the regulatory process, and to ensure their concerns are heard and addressed by staff and the Commission in a meaningful way. CNSC staff are committed to ongoing consultation with the identified Indigenous groups and work to address any concerns they may have with regards to the licence amendment application and hearing process.

CNL has met the requirements set out in CNSC REGDOC-3.2.2 pertaining to Indigenous engagement. CNL has engaged with the identified Indigenous groups and is working towards addressing questions and concerns, as appropriate. CNSC staff encourage CNL to continue to engage with interested Indigenous communities on the decommissioning of the DPWF and other ongoing activities of interest to the groups.

4.2 Other Consultation

The CNSC made funding available through its PFP to assist Indigenous peoples, members of the public, and stakeholders in participating in the regulatory process for CNL's proposed DPWF licence amendment and providing value-added information to the Commission through informed and topic-specific interventions. This funding was offered to review CNL's application and associated documents and to prepare for and participate in the Commission's public hearing.

4.2.1 Discussion

The deadline for applications was March 6, 2020. A Funding Review Committee (FRC), independent from CNSC staff, reviewed the funding applications received, and made recommendations on the allocation of funding to eligible applicants. Based on recommendations from the FRC, the CNSC awarded a total of \$97,158.56 in funding to the following recipients, who are required to submit a written intervention and make an oral presentation at the Commission's public hearing in November 2020:

- Canadian Environmental Law Association, Northwatch, Concerned Citizens of Renfrew County, and Nuclear Waste Watch
- Historic Saugeen Métis
- Métis Nation of Ontario
- Saugeen Ojibway Nation
- Benoit Poulet
- Eugene Bourgeois
- Dr. Sandy Greer

4.2.2 Conclusion

The CNSC continues to actively promote ongoing communication and dissemination of regulatory and scientific information through social media channels, webinars, outreach in the local communities and postings on the CNSC web site. The CNSC has various mechanisms and processes, such as the PFP and mail-outs, to encourage the public to participate in the Commission's public hearing, as described above. Through the PFP, the CNSC has offered assistance to interested members of the public, Indigenous peoples, and stakeholders to prepare for and participate in the Commission's public hearing.

4.3 Cost Recovery

A Class I licensed nuclear facility is subject to the requirements of Part 2 of the *CNSC Cost Recovery Fees Regulations* (CRFR).

4.3.1 Discussion

Through review of CNSC records, CNSC staff have determined that CNL is in good standing with respect to CRFR requirements for the DPWF. CNL has paid its cost recovery fees in full.

4.3.2 Conclusion

CNSC staff have concluded that CNL is compliant with the CNSC's CRFR for the DPWF.

4.4 Financial Guarantees

The DPWF licence requires CNL to maintain in effect a financial guarantee for decommissioning of the DPWF that is acceptable to the Commission. CNSC Regulatory Guides G-219, *Decommissioning Planning for Licensed Activities*, and G-206, *Financial Guarantees for Decommissioning of Licensed Activities*, provide guidance on calculating the financial guarantees.

4.4.1 Discussion

With respect to a financial guarantee required by the paragraph 3(1)(l) of the *General Nuclear Safety and Control Regulations* (GNSCR), CNSC Regulatory Guide, G-206, *Financial Guarantees for the Decommissioning of Licensed Activities*, (2000) states that an expressed commitment from a federal or provincial government is an acceptable form of financial guarantee.

This commitment was last expressed to the CNSC in a letter from the Federal Minister of Natural Resources to Dr. Binder dated July 31, 2015 [17]. This letter states that AECL will retain ownership of the lands, assets and liabilities associated with CNL's licences, including the DPWF, and states that the liabilities of AECL are the liabilities of Her Majesty in Right of Canada. CNL confirmed that the provisions in the 2015 letter remain valid on August 25, 2020 [18].

4.4.2 Conclusion

CNSC staff confirm that a financial guarantee in a format that meets G-206 requirements is in place for the DPWF.

4.5 Licensee Public Information Program

A public information and disclosure program (PIDP) is a regulatory requirement for licence applicants. CNSC document RD/GD-99.3, *Public Information and Disclosure*, sets out the requirements for public information and disclosure. The primary goal of the program, as it relates to the licensed activities, is to ensure that information related to the health, safety and security of persons and the environment, and other issues associated with the lifecycle of nuclear facilities are effectively communicated to the public.

CNSC expectations of a licensee's public information program and disclosure protocol are commensurate with the level of risk of the facility and the level of public interest in the licensed activities. The program and protocol may be further influenced by the complexity of the nuclear facility's lifecycle and activities, and the risks to public health and safety and the environment perceived to be associated with the facility and activities.

4.5.1 Discussion

During the SWS period, CNL conducted limited public engagement on the DPWF. Subsequent to CNL's application to proceed with phase 3 decommissioning at the DPWF, CNL began increasing its outreach effort by enhancing the web content available regarding the DPWF, communicating with other nuclear organizations who have operations regionally (Bruce Power, Nuclear Waste Management Organization (NWMO) and Ontario Power Generation (OPG), and sending internal and external information emails to CNL employees, Bruce Power employees and the Bruce Power Pensioners Association. CNL has also provided updated information for the Bruce Power Visitor Centre and for the public bus tours of the Bruce site. Presentations have been made to local government representatives including the Kincardine Municipal Council, Bruce County Council, and local MPPs. Furthermore, several media releases related to the licence amendment application were produced.

A public hearing was originally scheduled for June 17-18, 2020. In response to the COVID-19 pandemic, a revised Notice of Public Hearing was issued by the Secretariat on May 24, 2020 (e-Doc 6265876) postponing the public hearing until August 19-20, 2020. To promote physical distancing and mitigate the spread of the virus, CNL reduced operations at all sites and restricted site access to only essential operational staff. Mitigation measures for COVID-19 reduced the ability of CNL to fulfill its obligations for engagement and outreach with interested communities. CNL's planned outreach including site tours, in-person meetings with interested parties, public presentations and community outreach sessions were postponed.

On April 30, 2020 CNL requested (e-Doc 6289045) that the hearing be postponed to the fall to allow additional time for outreach and engagement activities.

CNL has since used alternative means to perform public engagement, including hosting a webinar, and providing a web-based virtual tour of the facility.

CNSC staff will continue to monitor CNL's compliance with CNSC RD/GD-99.3 and ongoing implementation of the PIDP.

4.5.2 Conclusion

CNSC staff conclude that CNL's PIDP meets the regulatory requirements of RD/GD-99.3, *Public Information and Disclosure*. CNSC staff continue to oversee CNL's implementation of the PIDP to ensure that CNL meets its obligations regarding dissemination and notifying the public and Indigenous communities on its licensed activities. CNSC staff have also communicated with CNL to refine and update the PIDP on a regular basis to meet the changing information needs of its target audiences.

4.6 Nuclear Liability Insurance

The DPWF is currently designated, pursuant to section 7 of the *Nuclear Liability and Compensation Act* (NLCA) [19], as a nuclear installation in Item 14 of the Schedule (Section 2) of the *Nuclear Liability and Compensation Regulations* (NLCR) [20].

4.6.1 Discussion

The DPWF contains several facilities, which are authorized to contain nuclear material as defined in the NLCA. These facilities fall under various risk categories, as defined in paragraph 4(1) of the NLCR, and are listed in Column 4 of Item 14 in the Schedule.

Because the Spent Fuel Canister Area is a "Nuclear Fuel Waste Management Facility", it is the facility in this list with the highest risk. As a result, the DPWF falls under the "Nuclear Fuel Waste Management Facility Class" pursuant to paragraph 4(2) of the NLCR, and the operator's liability amount is prescribed at \$13 million pursuant to paragraph 5(c) of the NLCR.

4.6.2 Conclusion

CNSC staff conclude that CNL continues to maintain nuclear liability insurance under the NLCA, which came into force on January 1, 2017.

4.7 Delegation of Authority

The Commission may include in a licence any condition it considers necessary for the purposes of the NSCA. The Commission may delegate authority to CNSC staff with respect to the administration of licence conditions, or portions thereof.

There is one proposed licence condition in the proposed licence that contains the phrase "the Commission or a person authorized by the Commission": LC 3.2 Operating Performance.

Licence condition 3.2 states, "The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission."

CNSC staff recommend the Commission delegate its authority for the purposes described in the above licence condition to the following staff:

- Director, Canadian Nuclear Laboratories Regulatory Program Division
- Director General, Directorate of Nuclear Cycles and Facilities Regulation
- Executive Vice-President and Chief Regulatory Operations Officer,
Regulatory Operations Branch

5. OVERALL CONCLUSIONS AND RECOMMENDATIONS

CNSC staff have concluded the following with respect to section 67 of the *Canadian Environmental Assessment Act, 2012*:

1. that the carrying out of the proposed project is not likely to cause significant adverse environmental effects.

Therefore, CNSC staff recommend that the Commission:

1. make a determination that carrying out the proposed decommissioning activities at the Douglas Point Waste Facility is not likely to cause significant environmental effects in accordance with section 67 of the *Canadian Environmental Assessment Act, 2012*.

This determination is required before the Commission can exercise its power under the NSCA to authorize a project located on federal lands.

CNSC staff have concluded the following with respect to paragraphs 24(4)(a) and (b) of the *Nuclear Safety and Control Act* (NSCA) [13], in that CNL:

1. is qualified to carry on the activity that the licence will authorize the licensee to carry on; and
2. will in carrying out the licensed activities, has made, and will continue to make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

Therefore, CNSC staff recommend that the Commission:

1. accept CNSC staff's conclusions and amend the Waste Facility Decommissioning Licence for the Douglas Point Waste Facility as per the proposed licence attached to this CMD,
2. delegate authority as set out in section 4.7 of this CMD

REFERENCES

1. CMD 16-M12, Status Update for CNL Prototype Waste Facilities and Whiteshell Nuclear Laboratories, e-Doc 4952931.
2. CMD 18-M30, Progress Update for CNL's Prototype Waste Facilities, Whiteshell Laboratories and the Port Hope Area Initiative, e-Doc 5554206.
3. CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018, e-Doc 5926886.
4. CMD 14-H107, Application by Atomic Energy of Canada Limited to Replace the AECL Prototype Waste Management Facility Licences, e-Doc 4463206.
5. Record of Proceedings, Including Reasons for Decision in the Matter of Atomic Energy of Canada Limited Application to Replace the AECL Prototype Waste Management Facility Licences, July 16, 2014, e-Doc 4471304.
6. Record of Proceedings, Including Reasons for Decision In the Matter of Atomic Energy of Canada Limited Request for Five Licence Transfers to, and Request for Two Specific Exemptions for, Canadian Nuclear Laboratories Limited, October 23, 2014, e-Doc 4518088.
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14. *Canadian Environmental Assessment Act*, 2012, S.C. 2012, c. 19, s. 52. <https://laws-lois.justice.gc.ca/eng/acts/C-15.21/>.

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16. *Constitution Act*, 1982 <http://laws-lois.justice.gc.ca/eng/const/page-15.html#h-38>.
17. Letter, G. Rickford to M. Binder, dated July 31, 2015, e-Doc 4815508.
18. Letter, P. Boyle to K. Murthy, dated August 25, 2020, e-Doc 6373440.
19. *Nuclear Liability and Compensation Act* <http://www.laws.justice.gc.ca/eng/acts/N-28.1/FullText.html>.
20. *Nuclear Liability and Compensation Regulations* <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2016-88/>.

ACRONYMNS

AECL	Atomic Energy of Canada Ltd.
ALARA	As Low As Reasonably Achievable
BE	Below Expectations
BP	Bruce Power
CANDU	Canadian Deuterium Uranium reactor
CH&S	Conventional Health & Safety
CMD	Commission Member Document
CNL	Canadian Nuclear Laboratories Ltd.
CRFR	Cost Recovery Fees Regulation
DDP	Detailed Decommissioning Plan
DPWF	Douglas Point Waste Facility
DRL	Derived Release Limits
ECCC	Environment and Climate Change Canada
ECIS	Emergency Coolant Injection system
EER	Environmental Effects Review
EPR	Environmental Protective Review
ERA	Environmental Risk Assessment
FRC	Funding Review Committee
FS	Fully Satisfactory
G1WF	Gentilly-1 Waste Facility
GNSCR	General Nuclear Safety and Control Regulations
Go-Co	Government Owned-Contractor Operated
HSM	Historic Saugeen Métis
HTPS	Heat Transport Purification System
IEMP	Independent Environmental Monitoring Program
LCH	Licence Conditions Handbook
LLW	Low-Level Radioactive Wastes
ILW	Intermediate Level Waste
MNO	Métis Nation of Ontario
MPS	Moderator Purification System

mSv	Millisievert
MWe	Megawatt Electric
NEWs	Nuclear Energy Workers
NLCA	Nuclear Liability and Compensation Act
NLCR	Nuclear Liability and Compensation Regulations
NPDWF	Nuclear Power Demonstration Waste Facility
NPRI	National Pollutant Release Inventory
NSCA	Nuclear Safety and Control Act
NWMO	Nuclear Waste Management Organization
OPG	Ontario Power Generation
PCB	Polychlorinated Biphenyl
PDP	Preliminary Decommissioning Plan
PE	Planning Envelope
PFP	Participant Funding Program
PIDP	Public Information and Disclosure Program
RP	Radiation Protection
SA	Satisfactory
SCA	Safety and Control Area
SON	Saugeen Ojibway Nation
SWS	Storage with Surveillance
UA	Unacceptable
WFDL	Waste Facility Decommissioning Licence
WFOL	Waste Facility Operating Licence
Yr	Year

GLOSSARY

For definitions of terms used in this document, see REGDOC-3.6 Glossary of CNSC Terminology, which includes terms and definitions used in the *Nuclear Safety and Control Act* (NSCA) [13] and the regulations made under it, and in CNSC regulatory documents and other publications. REGDOC-3.6 is provided for reference and information.

A. RATING LEVELS

Fully Satisfactory (FS)

Safety and control measures implemented by the licensee are highly effective. In addition, compliance with regulatory requirements is fully satisfactory, and compliance within the safety and control area (SCA) or specific area exceeds requirements and CNSC expectations. Overall, compliance is stable or improving, and any problems or issues that arise are promptly addressed.

Satisfactory (SA)

Safety and control measures implemented by the licensee are sufficiently effective. In addition, compliance with regulatory requirements is satisfactory. Compliance within the SCA meets requirements and CNSC expectations. Any deviation is minor and any issues are considered to pose a low risk to the achievement of regulatory objectives and CNSC expectations. Appropriate improvements are planned.

Below Expectations (BE)

Safety and control measures implemented by the licensee are marginally ineffective. In addition, compliance with regulatory requirements falls below expectations. Compliance within the SCA deviates from requirements or CNSC expectations to the extent that there is a moderate risk of ultimate failure to comply. Improvements are required to address identified weaknesses. The licensee is taking appropriate corrective action.

Unacceptable (UA)

Safety and control measures implemented by the licensee are significantly ineffective. In addition, compliance with regulatory requirements is unacceptable and is seriously compromised. Compliance within the SCA is significantly below requirements or CNSC expectations, or there is evidence of overall non-compliance. Without corrective action, there is a high probability that the deficiencies will lead to unreasonable risk. Issues are not being addressed effectively, no appropriate corrective measures have been taken and no alternative plan of action has been provided. Immediate action is required.

B. BASIS FOR THE RECOMMENDATIONS

B.1 Regulatory Basis

The recommendations presented in this CMD are based on compliance objectives and expectations associated with the relevant SCAs and other matters. The regulatory basis for the matters that are relevant to this CMD are as follows.

Radiation Protection

- The *General Nuclear Safety and Control Regulations* require, under subsection 3(1) that a licence application contain the following information under paragraph:
 - 3(1)(e), the proposed measures to ensure compliance with the *Radiation Protection Regulations*.
 - 3(1)(f), any proposed action level for the purpose of section 6 of the *Radiation Protection Regulations*.
- The *Radiation Protection Regulations* require, under sections 4 to 6 that the licensee implements a radiation protection program, ascertain and record doses, and take the required actions in the case that an action level has been reached.
- The *Class I Nuclear Facilities Regulations* require that an application for a licence to operate a Class I nuclear facility contain the following information under paragraph:
 - 6(e), the proposed procedures for handling, storing, loading, and transporting nuclear substances and hazardous substances.
 - 6(h), the effects on the environment and the health and safety of persons that may result from the operation and decommissioning of the nuclear facility, and the measure that will be taken to prevent or mitigate those effects.

Conventional Health and Safety

- It is a requirement of the *Class I Nuclear Facilities Regulations* under paragraph 3(f) that an application for a licence in respect of a Class I nuclear facility, other than a licence to abandon, shall contain the proposed worker health and safety policies and procedures.
- The DPWF's activities and operations must comply with the Canada Labour Code, Part II: Occupational Health and Safety.

Environmental Protection

- The *General Nuclear Safety and Control Regulations*, under paragraphs 12(1)(c) and (f) require that each licensee take all reasonable precautions to protect the environment and the health and safety of persons, and to control the release of radioactive nuclear substances and hazardous substances within the site of the licensed activity and into the environment.
- The *Radiation Protection Regulations* prescribe the dose limit for the general public, which under subsection 1(3) is 1mSv per calendar year.

- In addition, Sections 3 and 6 of the *Class I Nuclear Facilities Regulations* must be met by the applicant. The application for a licence shall contain under paragraph:
 - 3(e), the name, form, characteristics, and quantity of any hazardous substances that may be on the site while the activity to be licensed is carried on.
 - 3(g), the proposed environmental protection policies and procedures.
 - 3(h), the proposed effluent and environmental monitoring programs.
 - 6(e), the proposed procedures for handling, storing, loading, and transporting nuclear substances and hazardous substances.
 - 6(h), the effects on the environment and the health and safety of persons that may result from the operation and decommissioning of the nuclear facility, and the measures that will be taken to prevent or mitigate those effects.
 - 6(i), the proposed location of points of release, the proposed maximum quantities and concentrations, and the anticipated volume and flow rate of releases of nuclear substances and hazardous substances into the environment, including their physical, chemical, and radiological characteristics.
 - 6(j), the proposed measures to control releases of nuclear substances and hazardous substances into the environment.

Waste Management

- It is a requirement of the *General Nuclear Safety and Control Regulations* under paragraph 3(1)(j) that an application for a licence include the name, origin, quantity, form, and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including waste that may be stored, managed, processed, or disposed of at the site of the activity to be licensed, and the proposed method for managing and disposing of that waste.

Packaging and Transport

- CNL is required to comply with *the Packaging and Transport of Nuclear Substances Regulations, 2015*, and Transport Canada's *Transportation of Dangerous Goods Regulations*.

Cost Recovery

- Paragraph 24(2)(c) of the *Nuclear Safety and Control Act* requires that a licence application is accompanied by the prescribed fee.
- The *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations* (CRFR) set out the specific requirements based on the activities to be licensed.

Financial Guarantee

- The *General Nuclear Safety and Control Regulations* requires under paragraph 3(1)(l) that a licence application contains a description of any proposed financial guarantee relating to the activity to be licensed.

Licensee Public Information Program

- It is a requirement of the *Class I Nuclear Facilities Regulations* under paragraph 3(j) that an application for a licence in respect of a Class I nuclear facility, other than a licence to abandon, shall contain information on the licensee's public information program.

B.2 Technical Basis

The technical basis for the recommendations presented in this CMD are as follows. The following CNSC regulatory documents and CSA standards are relevant to DPWF.

Radiation Protection

- G-129, Rev. 1 *Keeping Radiation Exposures and Doses "As Low as Reasonably Achievable" (ALARA)*
- G-228 *Developing and Using Action Levels*

Conventional Health and Safety

- None provided

Environmental Protection

- REGDOC-2.9.1 *Environmental Principles, Assessments and Protection Measures, version 1.1*
- CSA N288.4 *Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills*
- CSA N288.5 *Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills*
- CSA N288.6 *Environmental risk assessment at Class I nuclear facilities and uranium mines and mills*
- CSA N288.7 *Groundwater protection programs at Class I nuclear facilities and uranium mines and mills*
- CSA N288.8 *Establishing and implementing action levels to control releases to the environment from nuclear facilities*
- CSA N288.1 *Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities*
- CSA N288.2 *Guidelines for calculating the radiological consequences to the public of a release of airborne radioactive material for nuclear reactor accidents*

Waste Management

- CSA N292.0 *General principles for the management of radioactive waste and irradiated fuel*
- CSA N292.2 *Interim dry storage of irradiated fuel*
- CSA N292.3 *Management of low- and intermediate-level radioactive waste*

- CSA N292.6 *Long-term management of radioactive waste and irradiated fuel*
- REGDOC-2.11.1 *Waste Management, Volume III: Assessing the Long-Term Safety of Radioactive Waste Management*
- CSA N292.5 *Guideline for the exemption or clearance from regulatory control of materials that contain, or potentially contain, nuclear substances*
- CSA N294 *Decommissioning of Facilities Containing Nuclear Substances*
- G-219 *Decommissioning Planning for Licensed Activities*

Packaging and Transport

- IAEA SSR-6 *Regulations for the Safe Transport of Radioactive Material (2012 Edition)*
- RD-364 *Joint Canada-United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages*
- REGDOC-2.14.1 *Information Incorporated by Reference in Canada's Packaging and Transport of Nuclear Substances Regulations, 2015*

C. SAFETY AND CONTROL AREA FRAMEWORK

C.1 Safety and Control Areas Defined

The safety and control areas identified in section 2.2, and discussed in summary in sections 3.1 through 3.14 are comprised of specific areas of regulatory interest which vary between facility types.

The following table provides a high-level definition of each SCA.

SAFETY AND CONTROL AREA FRAMEWORK		
Functional Area	Safety and Control Area	Definition
Management	Management System	Covers the framework that establishes the processes and programs required to ensure an organization achieves its safety objectives, continuously monitors its performance against these objectives, and fosters a healthy safety culture.
	Human Performance Management	Covers activities that enable effective human performance through the development and implementation of processes that ensure a sufficient number of licensee personnel are in all relevant job areas and have the necessary knowledge, skills, procedures and tools in place to safely carry out their duties.
	Operating Performance	Includes an overall review of the conduct of the licensed activities and the activities that enable effective performance.
Facility and Equipment	Safety Analysis	Covers maintenance of the safety analysis that supports the overall safety case for the facility. Safety analysis is a systematic evaluation of the potential hazards associated with the conduct of a proposed activity or facility and considers the effectiveness of preventative measures and strategies in reducing the effects of such hazards.
	Physical Design	Relates to activities that impact the ability of structures, systems and components to meet and maintain their design basis given new information arising over time and taking changes in the external environment into account.

	Fitness for Service	Covers activities that impact the physical condition of structures, systems and components to ensure that they remain effective over time. This area includes programs that ensure all equipment is available to perform its intended design function when called upon to do so.
Core Control Processes	Radiation Protection	Covers the implementation of a radiation protection program in accordance with the <i>Radiation Protection Regulations</i> . The program must ensure that contamination levels and radiation doses received by individuals are monitored, controlled and maintained ALARA.
	Conventional Health and Safety	The implementation of a program to manage workplace safety hazards and to protect workers.
	Environmental Protection	Covers programs that identify, control and monitor all releases of radioactive and hazardous substances and effects on the environment from facilities or as the result of licensed activities.
	Emergency Management and Fire Protection	Covers emergency plans and emergency preparedness programs that exist for emergencies and for non-routine conditions. This area also includes any results of participation in exercises.
	Waste Management	Covers internal waste-related programs that form part of the facility's operations up to the point where the waste is removed from the facility to a separate waste management facility. This area also covers the planning for decommissioning.
	Security	Covers the programs required to implement and support the security requirements stipulated in the regulations, the licence, orders, or expectations for the facility or activity.
	Safeguards and Non-Proliferation	Covers the programs and activities required for the successful implementation of the obligations arising from the Canada/International Atomic Energy Agency (IAEA) safeguards agreements, as well as all other measures arising from the <i>Treaty on the Non-Proliferation of Nuclear Weapons</i> .

	Packaging and Transport	Programs that cover the safe packaging and transport of nuclear substances to and from the licensed facility.
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D. ENVIRONMENTAL PROTECTION REVIEW REPORT

e-Doc 6104363 (Word)

e-Doc 6274433 (PDF)



Environmental Protection Review Report: Canadian Nuclear Laboratories Douglas Point Waste Management Facility – WFDL-W4-332.02/2034 Licence Amendment

November 2020

e-Doc: 6104363 (Word)

e-Doc: 6274433 (PDF)



REVISION HISTORY

The following table identifies the revision history of this document.

Revision number	Change	Summary of changes	Date
000	Initial release	N/A	November 2020

EXECUTIVE SUMMARY

The Canadian Nuclear Safety Commission (CNSC) conducts Environmental Protection Reviews (EPRs) for all licence applications with potential environmental interactions, in accordance with its mandate under the *Nuclear Safety and Control Act* (NSCA), to ensure the protection of the environment and the health of persons. An EPR is a science-based environmental technical assessment by CNSC staff as set out in the NSCA. The fulfillment of other aspects of the CNSC's mandate, such as safety and security, are met through other regulatory oversight activities.

This EPR Report was written by CNSC staff for the Commission, Indigenous peoples and the public. It describes the scientific, evidence-based findings from CNSC staff's review of the application by Canadian Nuclear Laboratories (CNL) to amend the Waste Facility Decommissioning Licence (WFDL), WFDL-W4-332.02/2034, to proceed with final decommissioning of the Douglas Point Waste Facility (DPWF).

The CNSC's EPR Report can be read as a stand-alone document that focuses on topics that are of current public and regulatory interest, such as releases of radiological and hazardous substances to the receiving environment, as well as effects on valued components, including species at risk, during decommissioning activities.

This EPR Report includes CNSC staff's assessment of the documents submitted in support of the licence application, as well as, but not limited to the following:

- the results of effluent monitoring, as reported in CNL's Annual Compliance Monitoring Reports
- CNL's Environmental Effects Review and Environmental Risk Assessment
- CNL's Detailed Decommissioning Plan
- the findings of CNSC staff's Federal Lands Review (section 67 of the *Canadian Environmental Assessment Act, 2012*) conducted to assess the potential environmental effects of the proposed licence application, as well as any mitigation measures necessary to prevent, reduce or control these effects
- the results of CNSC's Independent Environmental Monitoring Program
- the results from other regional monitoring programs and/or health studies conducted in proximity to the DPWF by other levels of government

The information provided in this EPR Report supports the conclusions made by CNSC staff in Commission Member Document 20-H4 that based on CNSC staff's assessment of CNL's application, supporting documents and past performance, CNL continues to implement and maintain an effective environmental protection program to adequately protect the environment and the health of persons. The information provided in this EPR Report also supports CNSC staff's conclusion that, taking into account all proposed mitigation measures and their proper implementation, the proposed decommissioning activities are not likely to cause significant adverse effects on the environment and the people at or around the DPWF.

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this Environmental Protection Review (EPR) is to report the outcome of the Canadian Nuclear Safety Commission (CNSC) staff's review of licensing and environmental compliance activities conducted under the *Nuclear Safety and Control Act* (NSCA). This review serves to assess whether Canadian Nuclear Laboratories (CNL) has made, and will continue to make, adequate provisions to protect the environment and the health of persons at the Douglas Point Waste Facility (DPWF).

This EPR Report presents information that supports CNSC staff's recommendations in Commission Member Document (CMD) 20-H4 [1] regarding the proposal to amend the Waste Facility Decommissioning Licence (WFDL) - W4-332.02/2034 [2], as it pertains to environmental protection (EP). CNL has requested to amend its licence currently expiring on December 31, 2034 to proceed with final decommissioning of the DPWF [3].

CNSC staff assess the environmental and health effects of nuclear facilities and activities at every phase of its lifecycle. EPR Reports are prepared to provide transparency to the Commission, Indigenous peoples and the public regarding staff's assessment of the performance of the DPWF relating to EP. The fulfillment of other aspects of the CNSC's mandate, such as safety and security, are met through other regulatory oversight activities that are outside the scope of this report.

This EPR Report is based on information submitted by CNL, compliance and technical assessment activities completed by CNSC staff, and independent verification activities, including the following:

- Regulatory oversight (section 2.0)
- CNSC staff's review of the DPWF decommissioning strategy and program overview [4]
- CNSC staff's review of CNL's Annual Compliance Monitoring Reports ([5] to [10])
- CNSC staff's review of CNL's Environmental Effects Review (EER) and Environmental Risk Assessment (ERA) (sections 2.1.1.2 and 2.3.1) [11] [12]
- Independent Environmental Monitoring Program (IEMP) results (section 4.0)
- Health studies and regional monitoring programs in proximity to the DPWF (sections 5.0 and 6.0)

This EPR Report can be read as a stand-alone document that focuses on topics related to the environmental performance of the DPWF, such as releases of radiological and hazardous substances to the receiving environment, as well as effects on valued components, including species at risk. A review has been conducted for all valued components related to the project, but only a selection of topics is presented in detail in this report. The valued components and topics selected are based on licensing requirements, as well as those that have historically been of interest to the Commission, Indigenous peoples and the public. CNSC staff also present the findings of CNSC staff's Federal Lands Review (section 67 of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012)) conducted to assess the potential environmental effects of the proposed licence application, as well as any mitigation measures necessary to prevent, reduce

or control these effects. Finally, CNSC staff present information on any relevant regional environmental or health monitoring or studies conducted by the CNSC (i.e., IEMP) or other levels of government.

1.2 Project Background

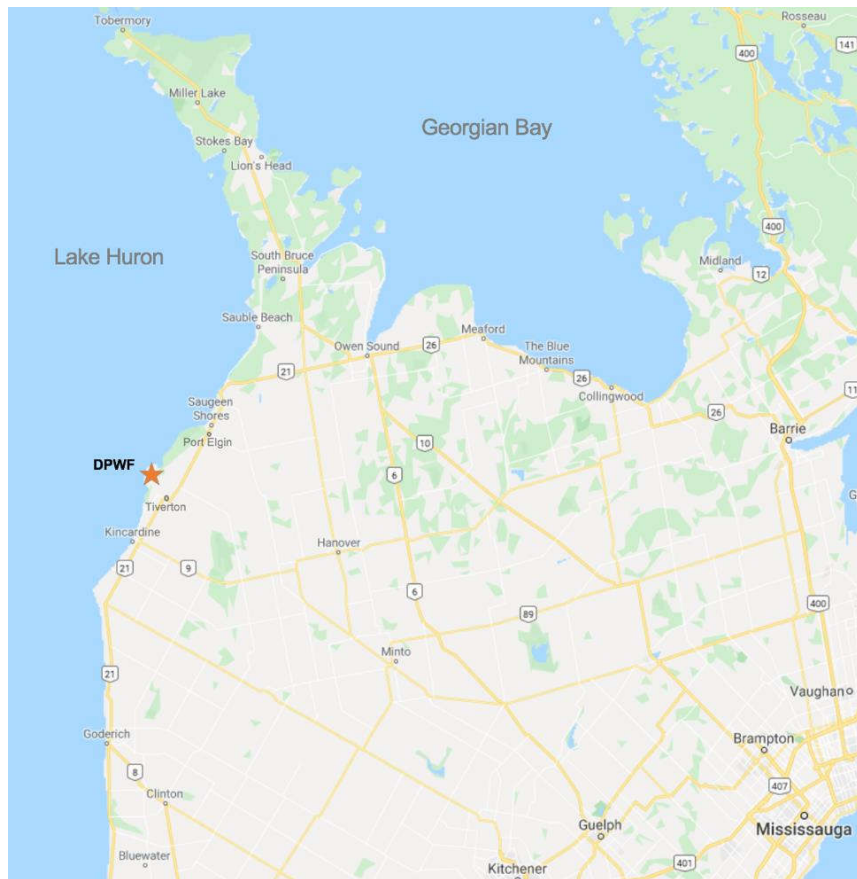
This section of the report provides general information on the DPWF. This includes a description of the site location and a basic history of site activities and licensing, followed by activities planned for the proposed licence period and an overview of the waste currently onsite.

This information is intended to provide context for later sections of this report, which discuss completed and ongoing regulatory oversight activities.

1.2.1 Site Description

The DPWF is located in Tiverton (Bruce County, Ontario), which is midway between Kincardine and Port Elgin, on the eastern shore of Lake Huron. The DPWF is entirely located within the Bruce nuclear site, which also encompasses Bruce A and B Nuclear Generating Stations (see figures 1.1 and 1.2).

Figure 1.1: Location of the Bruce nuclear site [11] (adapted from Google Maps)



Historically owned and operated by Atomic Energy Canada Limited (AECL), the Douglas Point site is comprised of approximately 5 hectares (50,000 square metres) of federal lands. The site

was established in the 1960s in order to operate Canada's first commercial-scale nuclear generating station, the Douglas Point Nuclear Generating Station. This 200-megawatt electric Canada deuterium uranium (CANDU) power reactor was commissioned in 1968 and permanently shut down in 1984. Shortly after, spent fuel was transferred from wet storage in the reactor pool to onsite dry storage. In 1987, the Douglas Point Nuclear Generating Station was relicensed as a waste management facility for an indefinite period, and renamed the DPWF in 2014.

In 2015, CNL took over management of the DPWF, and although AECL remains the site owner, operations are managed by CNL under a government-owned, contractor-operated ("Go-Co") model. The facility is currently in the *storage with surveillance* phase of a deferred decommissioning program.

Figure 1.2: Aerial view of the DPWF within the Bruce nuclear site (adapted from [13])



The buildings and structures that remain onsite are designated as non-nuclear or nuclear. Non-nuclear buildings are those that do not contain areas or materials with surface contamination greater than the maximum values identified for restricted use in CNL's Radiation Protection Program; that do not store prescribed equipment as defined in the *General Nuclear Safety and Control Regulations*; and that do not process, use or store nuclear substances as defined in the NSCA. Any building that does not meet these criteria is considered a nuclear building [4].

The following is a description of the non-nuclear buildings and structures at the DPWF:

- Turbine Building and Ancillary Facilities: a multi-level building that originally housed the turbine generator and associated structures. It has since been decontaminated and

cleared of radioactive materials. The former Water Treatment Area, old garage, carpenter's shop and diesel room, all out of service, are attached to this building.

- Administration Building: a two-storey building that contains a service room, empty offices, washrooms and a conference room. The building is unoccupied by office staff and is only accessed for inspections and monitoring activities.
- Steam Bridge: the steam piping and associated structures that originally provided steam from the Bruce Power Auxiliary Steam System to the DPWF for building heating.

The following is a description of the nuclear buildings and structures at the DPWF:

- Reactor Building: a permanently shutdown, partially decommissioned prototype CANDU reactor that contains a reactor core (defueled), heat transport system, shielding and safety systems, and associated equipment.
- Service Building: a two-storey building that includes the former Fuel Storage Bay in the basement, as well as an underground fuel transfer tunnel, which served as a passage for spent fuel from the reactor to the Fuel Inspection Bay. This tunnel currently contains stored radioactive material generated during the initial decommissioning. The 45-meter ventilation stack is also located on the southern part of this building.
- Purification Building: a single-storey building that originally housed the heavy water purification system. All major components and associated facilities have been removed.
- Spent Fuel Canister Area: a dry storage facility that houses 46 canisters with spent fuel and another canister for additional storage in case of routine or emergency fuel transfer operations. All 47 canisters are poured in-place concrete silos.
- Resin Storage Tanks and Vault: two stainless steel tanks that originally stored the radioactive spent resin resulting from the purification of primary coolant and moderator systems are located in an underground concrete vault that is connected to the Reactor Building. In 2018, both resin tanks were emptied.
- Active Liquid Handling System (also known as Active Drainage System): a set of facilities that house the collection tanks, pumps, activity monitors and piping originally used to control and dispose of all active liquid wastes. The system has no treatment capability anymore, but portions remain in place (see section 3.1.1.2). Some of the tanks have been emptied.

Figure 1.3 (in section 1.2.2) shows the location of all remaining buildings.

1.2.2 Project Overview

As described in CMD 20-H4 [1], following AECL's 1984 decision to shut down the Douglas Point Nuclear Generating Station, an initial strategy for decommissioning was developed [4]. This proposed strategy includes the following three phases, which are described in more detail in table 1.1:

- Phase 1: Establishment of a safe, sustainable shutdown state
- Phase 2: Storage with surveillance
- Phase 3: Final decommissioning

Phase 1 was completed in 1994, and since then, the DPWF has been in phase 2 (storage with surveillance). During phase 2, CNL performed some activities to reduce unnecessary risks and liabilities onsite, the details of which are in table 1.1. CNL recently applied for a licence amendment to be authorized to move from phase 2 to phase 3, which is final decommissioning.

Phase 3 decommissioning would occur in a staged manner, with the removal of less complex non-nuclear buildings first, followed by more complex, yet non-nuclear buildings, and ending with the nuclear facilities one by one. CNL defines this phased approach through the following five planning envelopes:

- Planning envelope A: non-nuclear area buildings and structures
- Planning envelope B: nuclear area buildings and structures, except for the Reactor Building and Spent Fuel Canister Area
- Planning envelope C: Reactor Building clear-out
- Planning envelope D: Spent Fuel Canister Area
- Planning envelope E: Reactor Building decommissioning

The proposed activities for each planning envelope are outlined in table 1.2. Figure 1.3 also shows the buildings and structures covered under each planning envelope.

CNL's application for a licence amendment is to authorize final decommissioning of all buildings under planning envelopes A, B and C. The application does not request authorization to decommission the Spent Fuel Canister Area (planning envelope D) and the Reactor Building (planning envelope E), both of which will remain in storage with surveillance. The last two planning envelopes are being deferred until a permanent waste disposal facility for intermediate and high-level radioactive waste is available in Canada. Therefore, if the Commission determines that all proposed activities under planning envelopes A, B and C are not likely to cause significant adverse effects (as per the Federal Lands Review process explained in section 2.1.1 below) and grants the requested licence amendment, CNL will not be allowed to perform the decommissioning activities associated with planning envelopes D and E within the current licence period. Furthermore, if and when CNL submits a new licence application to proceed with planning envelopes D and E, the Commission will be required to make another Federal Lands Review decision before a new licence can be granted. CNSC staff will also conduct additional environmental technical assessments to ensure that CNL has made, and will continue to make adequate provision for the protection of the environment and the health of persons.

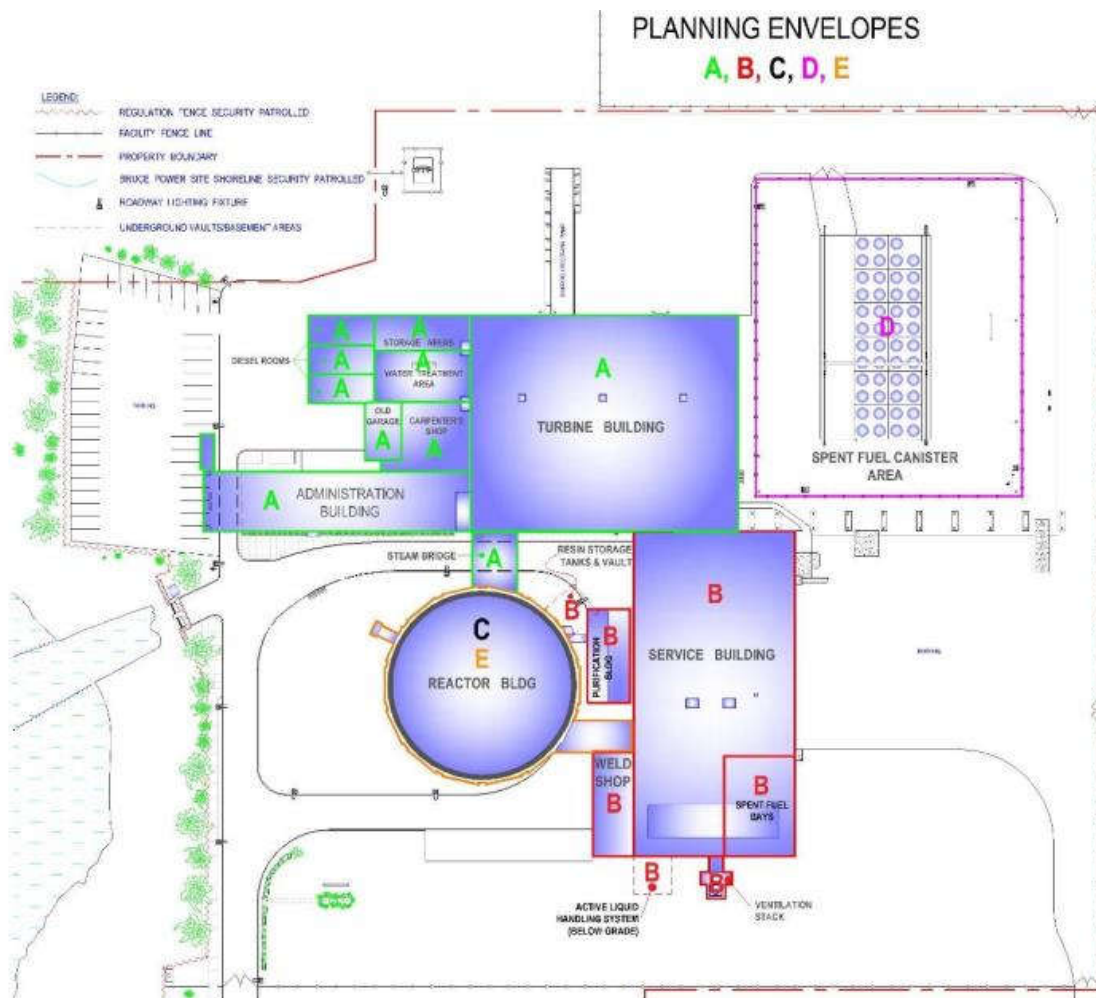
Table 1.1: Progress of phased approach to deferred decommissioning [4]

Phase	Description	Major activities	Status
Phase 1: Establishment of a safe, sustainable, shutdown state	Bring the facility into a safe state suitable for long-term storage with surveillance by reducing the radioactive inventory, removing hazards and implementing monitoring and surveillance systems	<ul style="list-style-type: none"> • Defueling of the reactor • Removal of heavy water from heat transport and moderator systems • Identification and removal of hazardous materials • Transfer of spent fuel from the reactor pool to the Spent Fuel Canister Area • Major and minor decontamination activities • Onsite consolidation of radioactive components • Radiological surveys on completion of each decommissioning activity 	Completed in 1994
Phase 2: Storage with surveillance	Conduct monitoring and surveillance of remaining buildings to allow for radioactive decay until final decommissioning – includes performing some activities to reduce unnecessary risks and liabilities onsite	<ul style="list-style-type: none"> • Identification and removal of more hazardous materials, such as asbestos, mercury and Polychlorinated biphenyls (PCBs) • Removal of low-level solid waste stored in the Reactor, Purification and Service Buildings • Removal of most of the contents of the Turbine Building • Removal of some non-nuclear buildings and structures, including the Guardhouse, Machine Shop, Plate Shop, Tool Crib, and Emergency Cooling Injection System Tank and Bunker • Removal of resins from Resin Storage Tanks 	Current phase (since 1994)
Phase 3: Final decommissioning	Completely remove the facility to achieve the final end-state – includes decommissioning and dismantling all remaining buildings and structures, and restoring the site to a brown field for industrial use	Proposed new activities are outlined in table 1.2.	Upcoming phase

Table 1.2: Scope of work for each planning phase of final decommissioning [11]

Planning phase	Proposed activities	Target date(s) (year)
Planning envelope A: Non-nuclear area	Stage 1: Project Planning <ul style="list-style-type: none"> Plan and prepare the dismantlement, demolition, disposal and site restoration for the Turbine Building, Administration Building, Ancillary Facilities and Steam Bridge 	2020
	Stage 2: Project Execution <ul style="list-style-type: none"> Removal of equipment and systems Dismantlement and/or demolition of buildings and structures, including removal of underground structures to a minimum of one meter below grade Waste segregation, compaction and disposal Site restoration, including grouting to fill the gaps/voids, backfilling and landscaping with clean soil 	2021 – 2024
	Stage 3: Project Closure <ul style="list-style-type: none"> Radiation survey Close-out documentation 	2025
Planning envelope B: Parts of nuclear area	Stage 1: Project Planning <ul style="list-style-type: none"> Plan and prepare the dismantlement, demolition, disposal and site restoration for the Purification Building, Service Building, Weld Test Shop and Resin Storage Tanks and Vault 	2022
	Stage 2: Project execution <ul style="list-style-type: none"> Decontamination and removal of non-structural components Dismantlement and/or demolition of buildings and structures, including removal of underground structures to a minimum of one meter below grade Waste segregation, compaction and disposal Site restoration, including grouting to fill the gaps/voids, backfilling and landscaping with clean soil 	2023 – 2024
	Stage 3: Project Closure <ul style="list-style-type: none"> Radiation survey Close-out documentation 	2025
Planning envelope C: Reactor Building clear-out	Stage 1: Project Planning <ul style="list-style-type: none"> Plan and prepare the Reactor Building clear-out 	2022
	Stage 2: Project Execution <ul style="list-style-type: none"> Decontamination, dismantlement and removal of equipment and structures, except the reactor core and its components (calandria, bio-shield, etc.) Removal of chemical contaminants, such as asbestos, mercury and PCBs 	2029

Planning phase	Proposed activities	Target date(s) (year)
	Stage 3: Project Closure <ul style="list-style-type: none"> • Radiation survey • Close-out documentation 	2030
Planning envelope D: Spent Fuel Canister Area	To be determined – not included in the scope of this proposed project	After current licence period
Planning envelope E: Reactor Building decommissioning	To be determined – not included in the scope of this proposed project	After current licence period

Figure 1.3: DPWF layout and planning envelopes [11]

1.2.3 Waste Inventory

Waste currently stored onsite is comprised of hazardous waste, radioactive waste and mixed waste (which is radioactive waste that also contains hazardous substances), including high-level waste (HLW), intermediate-level waste (ILW) and low-level waste (LLW). It is expected that only LLW and hazardous waste will be generated, segregated and handled during this proposed project (planning envelopes A to C). It is not anticipated that any ILW or HLW will be generated by the work in planning envelopes A to C. CNSC staff will verify and confirm the types and volumes of waste that will be generated, segregated and handled at each phase of the proposed project through CNL's waste characterization, which will be performed prior to the start of the decommissioning work for each planning envelope.

CNL does not expect to generate radioactive waste during the decommissioning of the non-nuclear buildings and structures (planning envelope A). However, planning envelopes B and C will involve managing and disposing of LLW, albeit in small quantities. Table 1.3 provides a summary of the types and quantities of waste that CNL estimates will be handled during the

proposed project. More information on waste management is available in section 3.3 of CMD 20-H4 [1].

Table 1.3: Waste estimate for the proposed decommissioning project [4]

	Planning envelope A	Planning envelope B	Planning envelope C	Total
Potentially clearable waste	23 451 m ³ 3 578 MT	9 694 m ³ 944 MT	0 m ³ 596 MT	33 145 m ³ 5 118 MT
Hazardous waste	340 m ³ 32 MT	0 m ³ 0 MT	0 m ³ 0 MT	340 m ³ 32 MT
Radioactive - LLW	0 m ³ 0 MT	22 m ³ 19 MT	0 m ³ 214 MT	22 m ³ 233 MT
Radioactive - ILW	0 m ³ 0 MT	0 m ³ 0 MT	0 m ³ 0 MT	0 m ³ 0 MT
Radioactive - HLW	0 m ³ 0 MT	0 m ³ 0 MT	0 m ³ 0 MT	0 m ³ 0 MT
Total	23 791 m ³ 3 610 MT	9 716 m ³ 963 MT	0 m ³ 810 MT	33 507 m³ 5 383 MT

[1] m³ stands for “cubic meters” and accounts for the following waste streams: concrete, masonry, miscellaneous construction waste and excavated materials

[2] MT stands for “metric tons” (which is equal to 1,000 kilograms) and accounts for the following waste streams: structural steel and miscellaneous metals, rebar, mechanical and electrical waste

2.0 REGULATORY OVERSIGHT

The CNSC regulates nuclear facilities and activities in Canada to protect the environment and the health of persons in a manner that is consistent with Canadian environmental policies, acts and regulations, and with Canada’s international obligations. The CNSC assesses the environmental effects of nuclear facilities and activities at every phase of their lifecycle. This section of the EPR Report discusses the CNSC’s regulatory oversight of EP measures at the DPWF.

2.1 Environmental Protection Reviews

Under the NSCA, an assessment of the environment is part of the ongoing lifecycle EP framework, whereby EPR Reports such as this one, are produced. No decision is made on the EPR itself, as the information is intended to inform and support the regulatory decision being sought from the Commission by the licensing matter explained in the body of CNSC staff’s CMD 20-H4 [1].

Depending on the scope and impact of project activities, other legislation such as the *Impact Assessment Act* (IAA) [14] or the former CEAA 2012 [15] may require or have required the completion of an Impact Assessment (IA), Environmental Assessment (EA) or Federal Lands Review. The purpose of any one of those assessments is to identify the possible effects of a

proposed project on the environment, and determine whether these effects can be adequately mitigated to protect the environment and the health of persons. An IA, EA or Federal Lands Review decision by the Commission, concluding no significant adverse effects, is required before a licence can be granted.

When the DPWF was first constructed and began operations in 1960 and 1964, respectively, no EA was carried out, as there were no EA requirements stipulated in either federal guidelines or legislation at the time. Since then and until recently, no IA, EA or Federal Lands Review had been required for the DPWF.

2.1.1 Federal Lands Review under CEAA 2012

2.1.1.1 CNSC's Federal Lands Review

The proposed project (activities under planning envelopes A to C) is subject to the federal lands review provision of CEAA 2012¹ because the proposed decommissioning activities at the DPWF:

- do not constitute a designated project as per the *Regulations Designating Physical Activities* [16] under CEAA 2012
- are considered a “project” under section 66 of CEAA 2012, i.e., physical activities proposed to be carried out on federal lands in relation to a physical work
- require a decision by the CNSC as a federal authority (i.e., the issuance of a licence amendment)
- have not been exempted under section 70 of CEAA 2012 (e.g., for matters of national security or national emergency)

Given that all of the above conditions apply, the Commission is responsible for determining whether carrying out the proposed decommissioning activities at the DPWF is likely to cause significant adverse environmental effects in accordance with section 67 of CEAA 2012. This determination is required before the Commission can exercise its power under the NSCA to authorize a project located on federal lands.

With the objective of making a recommendation to the Commission on this matter, CNSC staff conducted a Federal Lands Review to assess the potential environmental effects of the proposed project, as well as any mitigation measures necessary to prevent, reduce or control these effects. While federal authorities have the discretion to decide how to conduct their assessment, for consistency, CNSC staff adopted the approach suggested in the federal guidance document titled: [*Making a determination under section 67 of the Canadian Environmental Assessment Act, 2012*](#) [17]. For increased transparency to the Commission, Indigenous peoples and the public, the detailed results of CNSC staff's assessment are provided in section 3 of this report. In addition, CNSC staff completed an Environmental Effects Evaluation Form, which is provided in Appendix 1: Environmental Effects Evaluation Form, to demonstrate the federal guidance document's approach to documenting results.

¹ The licence application was received prior to the enactment of the IAA (August 2019), and therefore, is subject to the provisions of CEAA 2012 rather than those of the IAA.

To inform the Commission's decision, CNSC staff have determined that, based on CNL's documentation submitted to date, no significant adverse environmental effects are likely to occur provided that appropriate mitigation measures are implemented (these are described in section 3.2.7). This recommendation is captured in section 7 of this EPR Report, as well as section 1.4 of CMD 20-H4 [1].

2.1.1.2 CNL's Environmental Effects Review

In some instances, an individual project can trigger multiple federal authorities to conduct an environmental review. This is the case for this proposed project, where both the CNSC and AECL have requirements to undertake a Federal Lands Review in order to make a determination of significance under section 67 of CEAA 2012. Although AECL is acting as a federal authority for financially supporting the project, AECL delegated the responsibility of conducting the Federal Lands Review to CNL given the established Go-Co model.

To carry out the Federal Lands Review, CNL conducted an Environmental Effects Review (EER) in accordance with CNL's *Environmental Review of Non-Routine Work* [18] to assess the potential adverse environmental effects of non-routine work and propose mitigation measures to prevent, reduce, or control the identified effects.

CNL submitted the EER [11] to the CNSC in July 2019. CNSC staff reviewed and provided comments on CNL's EER. CNSC staff's comments were addressed and the EER was deemed complete by CNSC staff with sufficient information for CNSC staff to conduct our own Federal Lands Review. The EER determined that no significant adverse environmental effects are likely to occur provided that appropriate mitigation measures are implemented (these are described in section 3.2.7 below).

2.2 Detailed Decommissioning Plan

Decommissioning activities for nuclear facilities are regulated by the CNSC. The following section provides high-level information with respect to the Detailed Decommissioning Plan (DDP) for the DPWF site.

Decommissioning plans document the decommissioning strategy and end-state objectives; the major decontamination, disassembly and remediation steps; the approximate quantities and types of waste generated; an overview of the principal hazards and protection strategies; and an estimate of cost. As a full lifecycle regulator, the CNSC will continue to monitor and remain aware of the end-state of the DPWF. As decommissioning activities progress, they are expected to result in a decrease in both radiological and non-radiological (hazardous) releases to the environment, as the DPWF reaches its eventual end-state.

The decommissioning strategy for the DPWF is documented in the 2019 *Douglas Point Waste Facility Detailed Decommissioning Plan – Volume 1: Program Overview* [4]. CNL will be required to plan, implement and complete future decommissioning activities in accordance with this document, which CNSC staff have reviewed and accepted. In addition, CNL is required to develop and submit a separate volume for each of the project's planning envelopes, as such:

- Planning envelope A: DDP Volume 2
- Planning envelope B: DDP Volume 3

- Planning envelope C: DDP Volume 4

CNSC staff will need to approve each additional DDP before any of the included decommissioning activities can begin. Through analysis of these plans, CNSC staff can provide a high-level assessment of how the interactions between the project and the environment will change over time. As decommissioning activities progress and hazards present at the DPWF site are reduced and removed by CNL, these interactions are expected to result in a decrease in both radiological and hazardous releases to the environment.

Additional details are provided in the Waste Management Safety and Control Area, section 3.3 of the CMD 20-H4 [1].

2.3 Environmental Protection Measures

To meet CNSC's regulatory requirements under REGDOC-2.9.1 [19] [20], CNL is responsible for implementing and maintaining EP measures that identify, control and monitor releases of radiological and hazardous substances and effects on human health and the environment, from the DPWF. EP measures are an important component of the overall requirement for licensees to make adequate provision for the protection of the environment.

This and the following sections provide a brief summary of the DPWF EP framework and the status of each specific EP measure.

The EP program at the DPWF corresponds to CNL's company-wide EP program [21], which provides the framework for the implementation of CNL's Environment Policy. The EP program requirements apply to all CNL operated sites, including the DPWF. CNL is required to update its EP program to meet the latest regulatory requirements, including REGDOC 2.9.1 [19] and the associated CSA standards. The implementation status for these regulatory requirements is shown in table 2.1 below.

Table 2.1: Status of EP measures to implement regulatory documents and standards

Regulatory document or standard	Status
CNSC Regulatory Document REGDOC 2.9.1, <i>Environmental Protection: Policies, Programs and Procedures</i> (2013) [19]	Implemented
CSA N288.1-08, <i>Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities</i> [22]	Implemented
CSA N294-09 (reaffirmed 2014), <i>Decommissioning of Facilities Containing Nuclear Substances</i> [23]	Implemented
CSA N288.4-10, <i>Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills</i> [24]	Implemented
CSA N288.5-11, <i>Effluent Monitoring Program at Class I Nuclear Facilities and Uranium Mines and Mills</i> [25]	Implemented
CSA N288.6-12, <i>Environmental risk assessment at Class I nuclear facilities and uranium mines and mills</i> [26]	Implemented

Regulatory document or standard	Status
CSA N288.7-15, <i>Groundwater protection programs at class I nuclear facilities and uranium mines and mills</i> [27]	Scheduled: 2021
CSA N288.8-17, <i>Establishing and implementing action levels to control releases to the environment from nuclear facilities</i> [28]	Scheduled: 2020
CNSC Regulatory Document REGDOC 2.9.1, <i>Environmental Principles, Assessments and Protection Measures, version 1.1</i> (2017) [20]	Scheduled: 2021

To meet CNSC's regulatory requirements and ensure compliance with the EP program, CNL has implemented the following EP measures at the DPWF:

- Environmental Risk Assessment (ERA)
- Environmental Effects Review (EER)
- Effluent Emissions Control and Monitoring:
 - Derived release limits (DRLs)
 - Effluent Verification Monitoring Program (EVMP)²

In addition, CNL is required to submit Annual Compliance Monitoring Reports that detail the results of the EVMP, as well as other EP-related studies (e.g., wildlife surveys). These annual reports are reviewed by CNSC staff for compliance and verification, as well as trending. CNSC staff have reviewed and accepted the 2019 Annual Compliance Monitoring Report [5]. Once ready, a summary of the report will be available on [CNL's website](#) [29] (the 2018 summary is available in the interim).

While no Environmental Monitoring Program (EMP) is required at the DPWF (as explained in section 2.3.3), CNSC staff use Bruce Power's EMP, which is conducted for the entire Bruce nuclear site, including the DPWF, as an additional tool to ensure EP around the facility. More information is provided below, in section 2.3.3 of this report.

2.3.1 Environmental Risk Assessment

An ERA of nuclear facilities is a systematic process used to identify, quantify and characterize the risk posed by contaminants and physical stressors in the environment on human and other biological receptors, including the magnitude and extent of the potential effects associated with a facility. The ERA serves as the basis for the development or improvement of site-specific effluent and EMPs. The outcomes and results of these programs, in turn, inform and refine future revisions of the ERA.

In March 2019, CNL submitted an ERA for the DPWF [12] mainly based on 2016 effluent monitoring data from the DPWF EVMP [8], as well as 2012 to 2016 environmental monitoring data from Bruce Power's 2017 ERA [13]. The latter dataset considers airborne and waterborne releases from the entire Bruce nuclear site, including the DPWF, and is appropriate as

² Although the term "EVMP" follows CSA N288.5 terminology and CNL sometimes uses it in their documentation, CNL's official document title is "Effluent Monitoring Plan". To make the clear distinction between "Effluent Monitoring Plan" and "Environmental Monitoring Program" (or EMP), the acronym EVMP will be used throughout this report to refer to CNL's "Effluent Monitoring Plan".

concentrations in the vicinity of the Bruce nuclear site reflect emissions from all existing facilities (i.e., the Bruce A and B Nuclear Generating Stations, the Central Maintenance and Laundry Facility, the Western Waste Management Facility and the DPWF).

The ERA included an Ecological Risk Assessment (EcoRA) and a Human Health Risk Assessment (HHRA) for radiological and non-radiological (hazardous) contaminants and physical stressors resulting from releases from the Bruce nuclear site, including those from authorized discharges in the DPWF's current *storage with surveillance* state.

CNSC staff reviewed CNL's 2019 ERA and found it to be in accordance with CSA standard N288.6-12, *Environmental risk assessment at Class I nuclear facilities and uranium mines and mills* [26]. The conclusions of the ERA, summarized in table 2.2, show that effects on the environment and human health due to releases of contaminants to the air and water from the DPWF are negligible.

Table 2.2: Summary of the DPWF ERA conclusions

Type	Members of the public	Aquatic and terrestrial biota
Radiological	No adverse impacts expected from radiological contaminants of potential concern (COPCs) released from the Bruce nuclear site, including the DPWF	No adverse impacts expected from radiological COPCs released from the Bruce nuclear site, including the DPWF
Non-Radiological	No adverse impacts expected from non-radiological COPCs released from the Bruce nuclear site, including the DPWF	No adverse impacts expected from non-radiological COPCs released from the Bruce nuclear site, including the DPWF
Physical Stressors	No adverse impacts expected from noise	No adverse impacts expected from physical stressors, although noise effects on wildlife were not assessed due to lack of benchmarks

2.3.2 Effluent and Emissions Control and Monitoring

Controls on environmental releases are established in order to provide protection to the environment, as well as respect the principles of sustainable development and pollution prevention. The effluent and emissions prevention and control measures are established on the basis of industry best practice, the application of principles of optimization (e.g., in design) and “as low as reasonably achievable” (ALARA) principles, the respect of legislated limits and the results of an ERA (or applicable environmental reviews).

2.3.2.1 Derived Release Limits

In order to control radiological effluents and emissions, the draft DPWF Licence Condition Handbook (LCH) contains a reference to the site-specific DRLs [31]. The DRLs have been calculated using CSA Standard N288.1-08 [22] and following a radionuclide transport and exposure model that can be used to back-calculate release rates based on limiting exposure to a specified member of the public (representative person) to a dose less than the 1 millisievert (mSv) per year, which is the regulatory dose limit (as prescribed within the *Radiation Protection Regulations* [32]).

The most recent DRLs were provided for the DPWF in 2015 [31], and supersede the DRLs established in 2004. CNSC staff will ensure that CNL update the DRLs to reflect the pathways identified in the most recent ERA during the proposed licence period.

2.3.2.2 Effluent Verification Monitoring Program

CNL has implemented an EVMP [33] at the DPWF that CNSC staff have reviewed and determined is compliant with CSA Standard N288.5-11, *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [25]. This program consists of monitoring airborne and waterborne releases of radiological and hazardous substances from the facility.

Based on the review of the EVMP results presented in CNL's Annual Compliance Monitoring Reports (2014 to 2019) and the specific EVMP items confirmed during CNSC general inspections (2015 to 2017), CNSC staff conclude that the EVMP currently in place for the DPWF continues to protect the public and the environment.

2.3.3 Environmental Monitoring Program

CNSC requires licensees to design and implement an EMP specific to the monitoring and assessment requirements associated with their facility, and the environment within which the facility is situated.

In 2016, CNL conducted a gap analysis and determined that, given the very low levels of contaminants in airborne and waterborne releases, there was no regulatory requirement for an EMP at the DPWF. CNSC staff accepted this gap analysis, and, therefore, do not require a site-specific EMP for the current licence period. Given that the potential risk from airborne and waterborne releases is expected to remain low to negligible during the proposed decommissioning activities (as per the analysis in section 3), CNSC staff would not require a site-specific EMP over the proposed licence period either. However, since the DPWF is located within the Bruce nuclear site, all facility-specific releases, albeit negligible, contribute to those leaving the Bruce nuclear site. Therefore, Bruce Power's EMP, which is compliant with CSA Standard N288.4, *Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills*, reflects the influence of releases from all facilities within the Bruce nuclear site, and as a result, captures environmental monitoring for the DPWF. CNSC staff review this program and have completed inspections related to the program (the last field inspection took place in October 2019). More details on Bruce Power's EMP can be found on [Bruce Power's website](#) [34].

2.4 Greenhouse Gas Emissions

While there are a range of broadly applicable federal environmental regulations (e.g., petroleum products storage tanks, environmental emergency regulations), the management of greenhouse gas (GHG) emissions has been identified as a national priority.

Under the federal [Canadian Environmental Protection Act, 1999](#) (CEPA, 1999) [35], CNL is required to monitor GHG emissions [36]. Nuclear facilities that emit more than the CO₂ equivalent (CO₂e) emission reporting threshold on an annual basis must report their GHG emissions. The DPWF has been well below all GHG emission thresholds since 2013, and

therefore, CNL has not been required to report on GHG emissions in their Annual Compliance Monitoring Reports.

The CNSC maintains a collaborative working relationship with Environment and Climate Change Canada (ECCC) through a formal Memorandum of Understanding. This ensures a coordinated regulatory approach is achieved with respect to meeting all federal requirements associated with EP, including the management of GHG emissions.

3.0 STATUS OF THE ENVIRONMENT

For CNL's licence application to amend the DPWF licence, and in accordance with the Federal Lands Review triggered under section 67 of CEAA 2012 (see section 2.1.1), CNSC staff carried out an assessment of the potential interactions between the proposed decommissioning activities (planning envelopes A to C) and the environment. The following valued components are covered under this section, as they were deemed to be of specific interest to Indigenous peoples, the public, and/or regulatory decision-making:

- atmospheric environment
- soil
- terrestrial biota
- groundwater
- surface water and sediment
- aquatic biota
- human health (public and workers)
- environmental effects with respect to Indigenous peoples (i.e., changes to the environment on health and socio-economic conditions, physical and cultural heritage, current use of lands and resources for traditional purposes, any structure, site or thing that is of historical, archaeological, paleontological or architectural significance)

It should be noted that environmental components are regularly reviewed through annual reporting requirements and CNSC compliance verification activities, as detailed in other areas of this report. These are reported to the Commission in the EP Safety and Control Area of licensing CMDs and annual Regulatory Oversight Reports.

This section provides a summary of the status of the environment around the DPWF. It first includes a description of the radiological and hazardous releases to the environment (section 3.1), followed by an assessment of any potential effects to the environment, human health and Indigenous peoples, as a result of exposure to these contaminants (section 3.2).

This section also provides CNSC staff's conclusions on whether the proposed project is likely to cause adverse environmental effects in accordance with section 67 of CEAA 2012, and whether CNL will continue to make adequate provision for the protection of the environment and human health.

3.1 Releases to the Environment

3.1.1 Radiological Releases

3.1.1.1 Airborne releases

CNL controls and monitors airborne emissions to the environment under its EVMP. This program is based on CSA N288.5-11, *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [25] where radiological and hazardous emissions are monitored.

Airborne releases from the Service and Reactor Buildings are discharged to the atmosphere through the ventilation stack located on the Service Building. This stack is the only source of radiological emissions at the DPWF. The Service Building was decontaminated when the Douglas Point Nuclear Generating Station was shutdown. Therefore, any current releases to the atmosphere only originate from when the Reactor Building is being ventilated before and during inspections or maintenance and planned work. Potential releases to the atmosphere from the proposed decommissioning activities are explained in section 3.2.1 below.

Emissions with potential radiological contaminants are sampled, analysed and monitored for tritium, gross beta and carbon-14 (C-14), as part of the site's EVMP. CNSC staff expect CNL to continue to monitor these radiological contaminants as part of the site's EVMP. Table 3.1 provides the annual radiological releases to the atmosphere between 2014 and 2019, compared against site-specific DRLs to ensure releases to the environment do not exceed the annual regulatory public dose limit of 1 mSv per year, which is protective of human health. As shown in table 3.1, all radiological emissions from the DPWF remain at a very small fraction of the DRLs.

Table 3.1: Annual airborne radiological releases from the DPWF compared with applicable release limits (2014 – 2019) ([5] to [10])

Emission	Tritium (Bq/yr)^[1]	Gross beta^[2] (Bq/yr)	C-14 (Bq/yr)
DRL (2014 - 2019)	5.46E+17	3.69E+12 ^[3]	3.22E+15
2014	2.74E+11	N/A ^[2]	3.07E+08
2015	1.33E+10	N/A ^[2]	4.49E+08
2016	1.59E+11	<1.91E+04	6.10E+09
2017	1.12E+11	2.29E+04	N/A ^[4]
2018	7.96E+11	4.55E+04	1.51E+09
2019	2.41E+11	3.90E+04	N/A ^[4]

[1] Units are in becquerels per year (Bq/yr)

[2] Parameter added as of April 2016, and therefore, not sampled in 2014 and 2015

[3] DRL for gross beta is based on strontium-90

[4] C-14 is only monitored for specific projects for which there is a potential measurable release (e.g., from spent resin). No relevant projects were held in 2017 and 2019, hence the lack of data.

3.1.1.2 Waterborne Releases

CNL controls and monitors liquid effluent to the environment under its EVMP. This program is based on CSA N288.5-11, *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [25] where radiological and hazardous releases are monitored.

The following two types of drainage systems exist at the DPWF:

- the Active Drainage System
- the Inactive Drainage System, which includes the Sub-Surface Drainage System

The Active Drainage System (also known as the Active Liquid Handling System) consists of floor drains in the Reactor Building and two zones of the Service Building that direct liquid wastes to the Evaporator Feed Tank (the only one of four collection tanks still in operation). Only small quantities of radioactive liquids are being generated at the DPWF through condensation and/or infiltration of surface water in the Reactor and Service Buildings. Radioactive liquids from the Active Drainage System are not released to the environment given that they are stored in the Evaporator Feed Tank. Should the tank wastewater need to be drained, it would be sampled, analyzed and handled through the appropriate disposal route commensurate with the levels of contamination found.

The Inactive Drainage System directs storm water runoff (rain and melting snow) and groundwater away from onsite buildings and structures to prevent infiltration, ultimately discharging it into Lake Huron through six discharge points. The system includes roof and flood

drains, groundwater sumps, sub-surface drainage pipes, catch basins and drainage ditches. Figure 3.1 depicts this drainage system, while figure 3.2 is a flow diagram of the drainage system.

Figure 3.1: Inactive Drainage System [11]

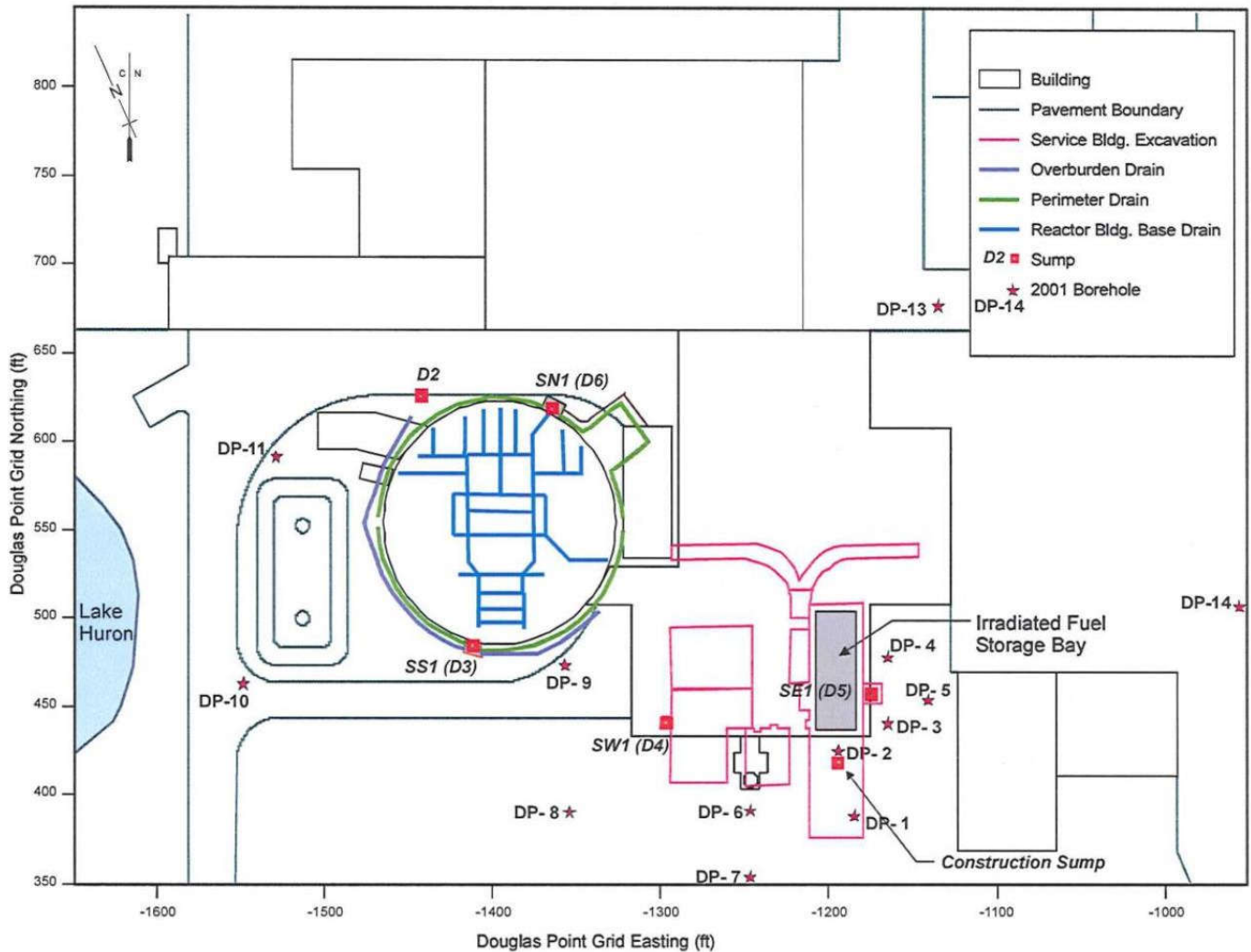
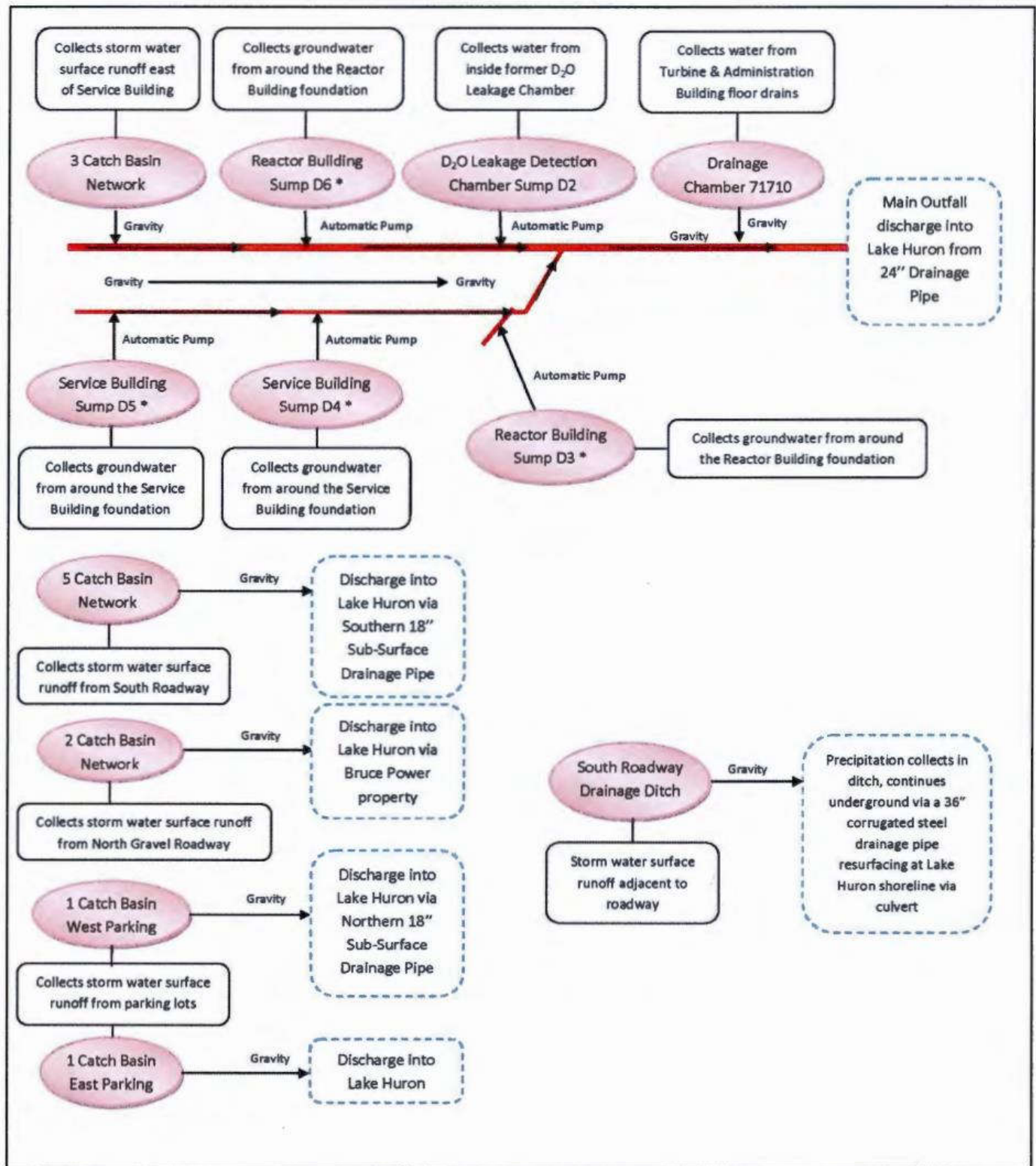


Figure 3.2: Flow diagram of effluent discharge points [33]



Radioactive liquids are not expected to be released from the site during ongoing or proposed decommissioning activities (see sections 3.2.3 and 3.2.4 below) as they are and will continue to be collected via the Active Drainage System. However, to confirm that radiological releases from the Inactive Drainage System are and will continue to be low, effluents with potential radiological contaminants are and will continue to be sampled, analysed and monitored at onsite groundwater sumps for gross beta and tritium, as part of the site's EVMP. Table 3.2 provides the annual radiological releases to Lake Huron between 2014 and 2019, compared to site-specific DRLs to ensure releases to the environment do not exceed the annual regulatory public dose limit of 1 mSv per year, which is protective of human health. As shown in table 3.2, all radiological releases to the aquatic environment of Lake Huron have been orders of magnitude below the DRLs.

Table 3.2: Annual waterborne radiological releases from the DPWF compared with applicable release limits (2014 – 2019) ([5] to [10])

Emission	Tritium (Bq/yr)	Gross beta (Bq/yr)
DRL (2014 - 2019)	2.04E+17	3.43E+13 ^[1]
2014	5.19E+10	6.37E+07
2015	4.24E+10	7.31E+07
2016	2.23E+10	1.05E+07
2017	3.57E+10	2.56E+07
2018	2.73E+10	1.97E+07
2019	3.73E+10	4.52E+07

[1] DRL for gross beta is based on cesium-134

3.1.2 Non-Radiological Releases

3.1.2.1 Airborne Releases

The following hazardous substances at the DPWF have the potential to be released to air and/or water:

- Lead from lead-based paints and lead blocks in the Reactor Building
- Asbestos and asbestos-containing materials (e.g., floor tiles, pipe lagging)
- Mercury from instrument panel switches
- PCBs from fluorescent light ballasts
- Minor hydrocarbon emissions from a small number of old, non-operating air conditioning units

- Minor GHG emissions, carbon dioxide, methane and nitrous oxide from site-wide vehicle usage
- Dust from vehicles travelling on unpaved surfaces onsite

CNL's EVMP at the DPWF includes meeting other federal requirements for reporting of releases of hazardous substances, including:

- an annual review against the [National Pollutant Release Inventory](#) (NPRI) [37] reporting requirements
- an annual review against the GHG emissions reporting requirements (as explained in section 2.4)
- monitoring and reporting of any losses of halocarbon refrigerants and fire suppressants over 10 kilograms, in accordance with the *Federal Halocarbon Regulations* [38]

Hazardous releases have been below the reportable limits for NPRI emissions, GHG emissions and halocarbon emissions for the current licensing period.

3.1.2.2 Waterborne Releases

CNL's EVMP does not include annual monitoring of hazardous substances in releases to surface water via liquid effluents. Effluent sampling at the DPWF was conducted in 2015 for a variety of hazardous substances. As a result of the DPWF effluent sampling results, CNL's 2019 ERA [12] identified that low levels of lead, mercury and PCBs could be released from the DPWF to Lake Huron. CNL also considered the list of hazardous contaminants in surface water (Lake Huron) from Bruce Power's 2017 ERA [13], and assessed whether they could reasonably be expected to be released from the DPWF. CNL conservatively retained barium, manganese, and sulphate for further assessment in their ERA when considering effects on aquatic biota in Lake Huron.

CNL's 2019 ERA used Bruce Power's 2017 ERA results as the bounding case for these hazardous substances in Lake Huron. Bruce Power's 2017 ERA concluded that there is no risk to aquatic biota from hazardous contaminant concentrations in Lake Huron. Therefore, concentrations of lead, mercury, PCBs, barium, manganese and sulphate in Lake Huron adjacent to the Bruce nuclear site are low, and it can be assumed that releases of these hazardous substances from the DPWF are also low and are expected to remain low during the proposed decommissioning activities (see sections 3.2.3 and 3.2.4 below).

3.1.3 Conclusions

Based on staff's review of CNL's EVMP results, CNSC staff conclude that CNL's reported radiological releases to the atmospheric environment and to Lake Huron from the DPWF have remained below CNSC-approved licence limits during the current licensing period. Additionally, CNL continues to verify that hazardous substances emitted to air and water remain low and, in some cases, below reporting thresholds. As decommissioning activities progress, CNSC staff expect CNL to continue to control, monitor and mitigate radiological and hazardous releases to the environment. These releases to the environment are expected to decrease, as the DPWF reaches its eventual end-state.

Based on all of the above, CNSC staff conclude that CNL continues to provide adequate protection of people and the environment.

3.2 Environmental Effects Assessment

CNSC staff carried out an assessment of the potential environmental effects of the licence application's proposed decommissioning activities as part of its environmental review under the NSCA, as well as to meet the requirements of the Federal Lands Review under CEAA 2012 (as explained in section 2.1.1).

The assessment was informed by staff's review of the licensee's DDP, ERA, EER and Annual Compliance Monitoring Reports, and was carried out in a step-wise manner, as follows:

- identify potential environmental and health effects
- determine whether significant adverse environmental effects are likely to occur, after taking into consideration mitigation measures

The first step resulted in the Project-Environment Interaction Matrix that can be found in Appendix 2: Project-Environment Interactions Matrix. While a review was conducted for all environmental components, only a selection of topics is presented in detail in the following sections. The environmental components were selected based on licensing requirements, as well as those that have historically been of interest to the Commission, Indigenous peoples and the public.

3.2.1 Atmospheric Environment

3.2.1.1 Effects on Air Quality and Noise

The atmospheric environment is characterized by climate, air quality and sound quality (noise). Taking into account these environmental subcomponents, the proposed decommissioning activities at the DPWF have the potential to generate minor radiological and hazardous emissions, including dust, as well as increased noise levels onsite. Table 3.3 shows how specific project activities could affect the atmospheric environment at and around the DPWF.

Table 3.3: Potential effects of the project on the atmospheric environment

Project activity	Potential environmental effect		
	Generation of radioactive particulates	Generation of non-radioactive particulates	Noise generation ^[1]
a. Removal of any remaining radioactive liquid or sludge	●		●
b. Removal of asbestos shingles and remnants of asbestos insulation		●	●
c. Removal of lead-based paints		●	●
d. Decontamination of concrete (e.g., scabbling)	●	●	●
e. Dismantlement of concrete buildings and associated structures (e.g., cutting)	●	●	●
f. Removal of contaminated soil, if required	●		●
g. Transportation of wastes to storage/disposal site	●		●

● = Potential project-environment interaction

Blank box = No potential project-environment interaction

[1] Effect assessed as small in magnitude and short in duration for all project activities

All activities identified in table 3.3 have the potential to generate dust and/or radioactive, lead and asbestos particulates, which could decrease the air quality around the DPWF. However, these effects are considered to be intermittent, small in magnitude, short or moderate in duration and localized in their geographic extent. With the exception of lead and asbestos, which will be controlled and mitigated (see next section), no other hazardous substances (i.e., mercury and PCBs) are expected to generate airborne emissions in measurable quantities. Noise from the operation of power tools and heavy machinery will be limited to the areas within or adjacent to the buildings targeted for decommissioning.

3.2.1.2 Mitigation Measures

While the proposed decommissioning activities have a small potential to adversely impact the atmospheric environment, CNL has proposed several mitigation measures that, if properly implemented, would prevent potential effects on air and sound quality or reduce them to negligible levels. These mitigation measures are presented in table 3.5 (in section 3.2.7), and include using standard dust control measures; using fixatives to seal contamination to the surfaces; adhering to procedures for the control of asbestos hazards; using sound barriers as required; and monitoring air quality during decommissioning activities.

CNSC staff will verify that all required mitigation measures are incorporated into the individual DDPs at each planning phase and are effectively implemented before project activities can begin.

3.2.1.3 Conclusion

Based on the assessment of effects on the atmospheric environment, CNSC staff conclude that the proposed decommissioning activities are not likely to cause significant adverse environmental effects on air and sound quality, provided that appropriate mitigation measures are implemented, and that CNL has and will continue to provide adequate protection of people and the environment.

3.2.2 Terrestrial Environment

Bruce County contains a number of large forested areas and wetlands, providing core habitat for a variety of wildlife species. Most of the wildlife habitats occur at the periphery of the Bruce nuclear site (which encompasses the DPWF), specifically in Inverhuron Provincial Park, the Baie du Doré wetland, Lake Huron's shoreline, and the conifer forests near or along the perimeter fence. Vegetation communities within and around the Bruce nuclear site have a long-standing history of human use and anthropogenic modification, such as logging, farming, recreational use, and the present-day industrial use.

3.2.2.1 Effects on Soil Quality

The assessment of soil quality in CNL's 2019 ERA [12] was based on the environmental concentrations in Bruce Power's 2017 ERA [13]. The most recent soil quality data was collected in 2016. These samples, collected from areas considered to represent ecological habitat within the site, were analyzed for radiological and hazardous substances. The areas associated with elevated concentrations were specific to the Bruce Power site (e.g., the construction landfill areas, the former fire training facility and the distribution stations) and not near the DPWF.

The proposed decommissioning activities at the DPWF could have potential interactions on soil quality. These could occur during the removal of buildings and underground services, as well as during site remediation. CNL is proposing to put in place mitigation measures to avoid or minimize any spread of radiological or hazardous contaminants through soil. These are summarized in table 3.5 (in section 3.2.7).

3.2.2.2 Effects on Terrestrial Biota

In 2016 and 2017, Bruce Power completed wildlife habitat and community assessments for their 2017 ERA [13]. Data from these surveys, which are relevant to the DPWF, was used by CNL in their 2019 ERA [12].

The following total numbers of species were reported on and around the Bruce nuclear site:

- 522 vascular plants, including species of trees, shrubs, vines, ferns, and forbs
- 26 species of small and large mammals
- 186 species of birds, including migrants and local breeders, such as the Canada Goose, Barn Swallow and Herring Gull
- 11 species of amphibians, including the Northern Leopard Frog
- 12 species of reptiles, including the Eastern Garter Snake and Midland Painted Turtle

In Ontario, the following legislation applies to species at risk: the provincial *Endangered Species Act* (ESA) [39] and the federal *Species at Risk Act* (SARA) [40]. To comply with these laws, and as part of Bruce Power's 2017 ERA [13], a wildlife survey was conducted to identify the species at risk potentially present on or around the Bruce nuclear site (which encompasses the DPWF).

Table 3.4 lists the eleven terrestrial species at risk that were identified as potentially present around the DPWF. In recent years, none of these species at risk have been observed within the fenced area of the DPWF. However, CNL has identified a "remote potential" for Barn Swallows (a migratory bird and endangered species) to nest in structures or buildings at the DPWF [12].

Table 3.4: Status of species at risk present around the DPWF

Common name	Ontario ESA status [39]	SARA Schedule 1 status [40]
Amphibians and reptiles		
Eastern Foxsnake	Endangered	Endangered
Eastern Ribbonsnake	Special concern	Special concern
Snapping Turtle	Special concern	Special concern
Spotted Turtle	Endangered	Endangered
Birds		
Barn Swallow	Threatened	Threatened
Short-eared Owl	Special concern	Special concern
Mammals		
Little Brown Myotis	Endangered	Endangered
Northern Myotis	Endangered	Endangered
Tri-colored Bat	Endangered	Endangered
Plants		
Butternut Tree	Endangered	Endangered
Dwarf Iris	Special concern	Special concern

Bruce Power's 2017 ERA [13] was used to assess the radiological and hazardous risk to non-human biota from normal operations of the site. The potential exposure pathways for terrestrial biota from radiological and hazardous substances is through external exposure pathways, such as air immersion, groundshine (i.e., external exposure to radiation from radioactive deposits on the ground), and consumption of potentially contaminated soil, vegetation or animals. The results from CNL's 2019 ERA show that there is no undue risk to terrestrial species, including species at risk, from exposure to radiological, hazardous and physical stressors associated with current

conditions at the DPWF [12]. While not all species at risk were specifically assessed in the ERA, the selected ecological receptors had similar feeding habits, and therefore, were used as surrogate species for the species at risk potentially present around the DPWF.

The proposed decommissioning activities at the DPWF are not expected to have effects on the local plants and animals. Waterborne and airborne releases from the DPWF (both radiological and hazardous) due to proposed decommissioning activities are expected to be negligible with the implementation of the proposed mitigation measures outlined in section 3.2.7.

Terrestrial biota could be exposed to physical stressors such as noise, bird strikes and vehicle-wildlife collisions. The results of Bruce Power's 2017 ERA, as applied to the DWMF, concluded that vehicle-wildlife collisions were negligible. No information was available regarding bird strikes at the Bruce nuclear site. Lastly, noise effects on wildlife were not assessed due to a lack of benchmarks. However, the effects assessment carried out for the atmospheric environment indicated that noise from decommissioning work will be localized, small in magnitude and short in duration. As such, it is highly unlikely that noise will pose adverse effects on non-human biota near the DPWF. CNL's 2019 ERA concluded that risks to terrestrial non-human biota due to physical stressors were negligible [12].

3.2.2.3 Mitigation Measures

To avoid or minimize potential effects to soil quality, soil monitoring will be conducted before any excavation activities can be executed to check for contamination and confirm if contamination levels meet the acceptability criteria for unrestricted land use. Any contaminated soil will be removed and stored onsite or transferred to suitable waste management areas at Chalk River Laboratories in accordance with CNL's procedure for the management of waste. Additionally, standard mitigation measures (e.g., using tarps to cover any contaminated soil) will be put in place to prevent contaminants in soil from spreading during excavation or remediation work.

Given the small potential for Barn Swallows (a migratory bird and endangered species) to nest at the DPWF, CNL has committed to monitor for nests prior to removing any structure or building during decommissioning work. In accordance with SARA [40] and the *Migratory Bird Convention Act* [41], if any active Barn Swallow nests were discovered during the proposed decommissioning activities, CNL would be responsible for notifying ECCC and the CNSC in order to jointly develop the most effective strategy to mitigate the impacts of habitat loss. Should Barn Swallow nests be discovered, CNL may also need to obtain a permit under section 73 of SARA to be authorized to continue with the project. In keeping with the precautionary principle, CNSC staff will ensure that CNL considers any preventive measures recommended by ECCC (e.g., using exclusion measures to discourage nesting) for the protection of Barn Swallows, and/or avoids work during the breeding bird period for migratory birds.

CNSC staff will verify that all required mitigation measures are incorporated into the individual DDPs at each planning phase and are effectively implemented before project activities can begin.

3.2.2.4 Conclusions

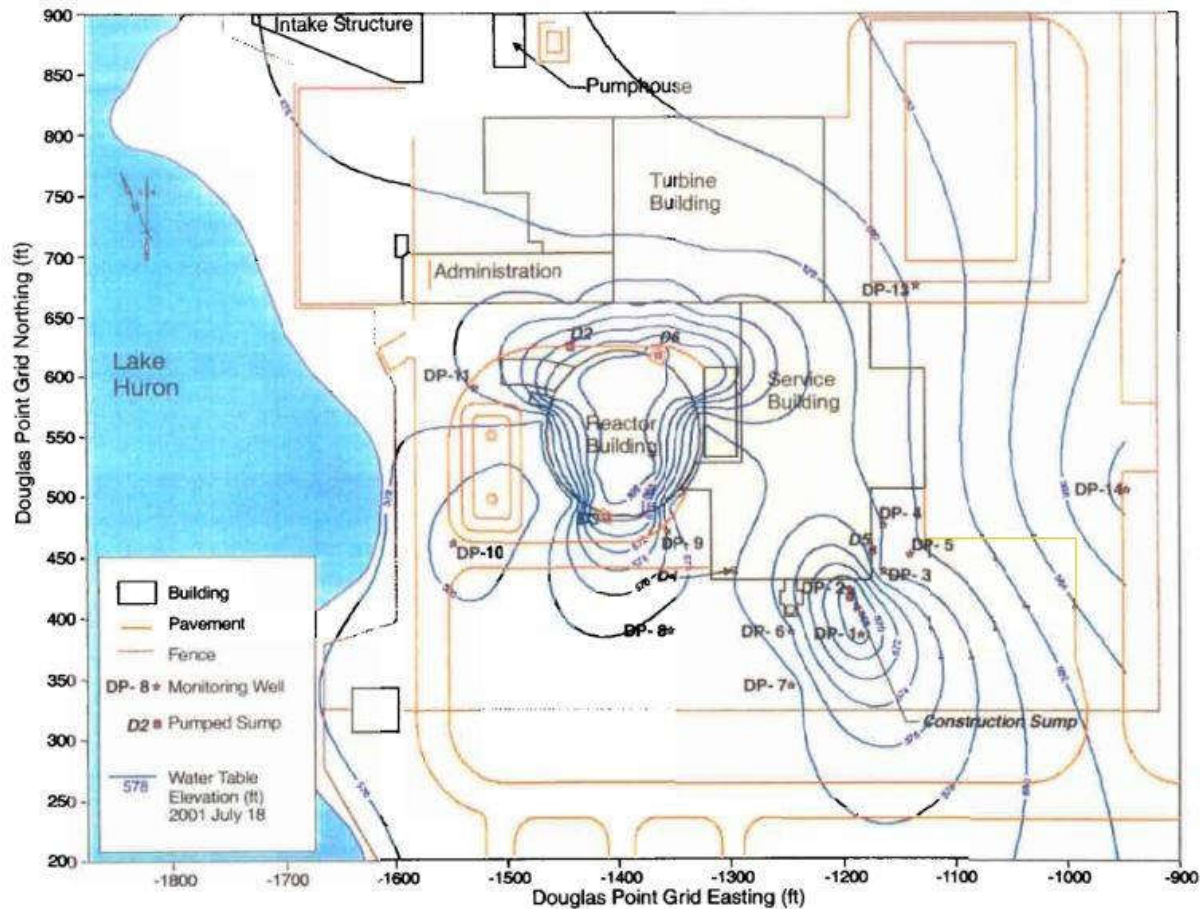
Based on the assessment of effects on the terrestrial environment, CNSC staff conclude that the proposed decommissioning activities are not likely to cause significant adverse environmental effects on soil quality, vegetation and terrestrial biota, including Barn Swallows, a threatened

species under SARA, provided that appropriate mitigation measures are implemented. In addition, CNSC staff conclude that CNL has and will continue to provide adequate protection of people and the environment.

3.2.3 Hydrogeological Environment

While groundwater generally flows towards Lake Huron, the groundwater table near the DPWF is strongly influenced by the operation of the Inactive Drainage System sump pumps that surround the foundations of the Reactor and Service Buildings. Figure 3.3 depicts the water table elevations at the DPWF in July of 2001, as an example.

Figure 3.3: Groundwater table map for the DPWF [42]



3.2.3.1 Effects on Groundwater

The proposed decommissioning activities at the DPWF have the potential to interact with groundwater. Based on CNL's measurements of the groundwater table at the DPWF, some parts of buildings and abandoned services, such as the old circulating water line from the pump house, are slightly below or close to the groundwater table, and therefore, excavation activities during the removal of those underground structures will likely impact groundwater. As a result, there may be groundwater seepage into the working area during removal work that will need to be analysed before being released to the environment (see next section on mitigation measures).

3.2.3.2 Mitigation Measures

To avoid or minimize potential groundwater seepage during certain excavation activities, the Inactive Drainage System will continue to direct groundwater away from structures and buildings. Moreover, CNL will conduct further assessments to better understand the current groundwater table conditions and re-evaluate whether there is a need to implement additional measures to better manage this potential seepage. This study will also support CNL's implementation of CSA N288.7-15, *Groundwater protection programs at class I nuclear facilities and uranium mines and mills* [27], which is scheduled for December 31st, 2021. If mitigation measures cannot eliminate the potential for groundwater seepage, CNL shall develop a contingency plan that includes sampling and criteria for discharging seepage water encountered during excavation of nuclear and non-nuclear buildings and structures.

CNSC staff will verify that all required mitigation measures, as well as the contingency plan, if required, are incorporated into the individual DDPs at each planning phase and are effectively implemented before project activities can begin.

3.2.3.3 Conclusion

Based on the assessment of effects on the hydrogeological environment, CNSC staff conclude that the proposed decommissioning activities are not likely to cause significant adverse environmental effects on groundwater provided that appropriate mitigation measures are implemented. In addition, CNSC staff conclude that CNL has and will continue to provide adequate protection of people and the environment.

3.2.4 Aquatic Environment

The DPWF is within the Bruce nuclear site and directly adjacent to Lake Huron. The Bruce nuclear site and its surroundings have aquatic features of natural, physical and cultural significance. These include the Lake Huron shoreline, Lake Huron commercial, recreational and Indigenous fisheries (offshore and nearshore), and the Baie du Doré Provincially Significant Wetland, which is located at the head of Baie du Doré. An overview of physical substrates within and around the Bruce nuclear site and extending into Lake Huron shows that much of the area is comprised of hard substrates, including exposed bedrock and bedrock overlain with pebbles, cobbles and boulders. The Baie du Doré and offshore areas also include pockets of sand interspersed among hard substrates [43].

Despite the overall similarity of the substrates, the nearshore areas of Lake Huron within and around the Bruce nuclear site contain diverse physical habitats that are determined mainly by depth, temperature and current velocities. These features define habitats that are used by a diversity of invertebrate and fish species through a variety of their life stages [43].

3.2.4.1 Effects on Surface Water and Sediment Quality

Any potential releases of radiological and hazardous contaminants (primarily total suspended solids) to Lake Huron were evaluated by CNSC staff and found to be below regulatory limits (as explained in sections 3.1.1.2 and 3.1.2.2). During decommissioning activities at the DPWF, there could be potential effects to surface water quality and sediment quality of Lake Huron from liquid wastes or storm water runoff. These potential effects would, however, be localized, of short duration and small in magnitude given that concentrations of contaminants in waterborne

releases are expected to remain well below the regulatory limit during decommissioning activities. In addition, with the proper implementation of the proposed mitigation measures outlined in section 3.2.4.3, risks to the hydrogeological environment are expected to be negligible.

3.2.4.2 Effects on Aquatic Biota

Emergent aquatic macrophytes occur only sparsely near the shoreline of the Bruce nuclear site and the DPWF, which is consistent with exposed, high-energy environments such as Lake Huron's nearshore. Coarse substrates tend to prevail in high-energy areas (e.g., wave action and ice scour), such that conditions do not exist for plant growth. The presence of periphyton along Lake Huron's shoreline in the Bruce area was confirmed in a 2014 algal growth study [44]. The Baie du Doré hosted higher concentrations of periphyton, because of the warmer water temperatures, limited ice scour and shelter from Lake Huron's wave action. Phytoplankton also exists in Lake Huron, but density and diversity are generally low because of low nutrient availability.

Lake Huron is divided into offshore and nearshore zones from a fish community perspective. The offshore fish community is generally composed of species that use open or deep waters for the majority of their life cycles. These fish make use of the nearshore areas during spawning periods and possibly to feed, but generally prefer cool and deep offshore waters. The nearshore fish community is comprised of those species that prefer shallow, warmer waters. Fish species listed as ecological receptors in CNL's 2019 ERA [12] were Smallmouth Bass, Lake Whitefish, Brook Trout, Lake Trout, Salmon, Spottail Shiner and White Sucker.

Bruce Power's 2017 ERA [13] also noted that Lake Huron's deep offshore habitats support Deepwater Sculpin, a species listed under SARA [40] as *special concern* (Schedule 1), but not listed under the provincial ESA [39]. The *special concern* status is indicative of a species being at risk of becoming threatened or endangered in the future. Under SARA, there is a Management Plan for the Deepwater Sculpin in Canada (Great Lakes – Western St. Lawrence populations). This action-oriented plan identifies the conservation activities and land use measurements needed to ensure, at minimum, that the species does not become threatened or endangered in the future [45].

The proposed decommissioning activities at the DPWF are not expected to have effects on aquatic biota adjacent to the DPWF. The effects assessments in section 3.2.4.1 indicated that potential effects on surface water and sediment quality are likely to be negligible, meaning that contaminants from the DPWF are unlikely to come into contact with aquatic species. Furthermore, as demonstrated in sections 3.1.1.2 and 3.1.2.2, waterborne releases from the DPWF (both radiological and hazardous) have remained well below regulatory limits or toxicological benchmarks, indicating that the sources of contamination have been negligible thus far. This evidence was corroborated by the results of the EcoRA conducted as part of CNL's 2019 ERA [12], which demonstrated that there is no undue risk to aquatic species, including Deepwater Sculpin, from exposure to radiological and hazardous contaminants³ with current conditions at the DPWF [12].

³ Radiological COPCs included tritium and gross beta radionuclides. Chemical COPCs included mercury, lead, PCBs, barium, manganese and sulphate.

3.2.4.3 Mitigation Measures

All liquid wastes are and will continue to be collected in tanks and characterized before being managed in accordance with CNL's procedure for the routine and non-routine discharge of liquids. Disposal methods include transferring wastewater to a waste treatment centre at Chalk River Laboratories; pre-processing wastewater to meet the acceptability criteria; solidifying liquid wastes; and/or dispersing them to the environment (if discharge criteria are met).

To avoid any adverse impacts to Lake Huron during project activities, fixed and/or loose contamination will be removed as a pre-condition to decommissioning. Decontamination of structures and buildings will occur to the point where the criteria for unrestricted land use are fully met, i.e., zero or minimum levels of contamination.

The Inactive Drainage System will continue to direct storm water runoff away from structures and buildings to prevent water contamination through infiltration. Additional barriers, such as berms, dikes and silt fences, will be considered in accordance with CNL's procedure for the management of surface water releases to Lake Huron. Finally, effluents with potential radiological contaminants will continue to be sampled, analysed and monitored for gross beta and tritium, as part of the site's EVMP.

CNSC staff will verify that all required mitigation measures are incorporated into the individual DDPs at each planning phase and are effectively implemented before project activities can begin.

3.2.4.4 Conclusions

Based on the assessment of effects on the aquatic environment, CNSC staff conclude that the proposed decommissioning activities are not likely to cause significant adverse environmental effects on Lake Huron's surface water quality, sediment quality and aquatic biota, including Deepwater Sculpin, a species of special concern under SARA, provided that appropriate mitigation measures are implemented. In addition, CNSC staff conclude that CNL has and will continue to provide adequate protection of people and the environment.

3.2.5 Human Environment

The human environment is characterized by members of the public living in the vicinity of the DPWF, as well as onsite workers. An assessment of potential effects on the human environment consists of assessing whether radiological and hazardous contaminants could have an impact on human health. Occupational exposure to radiation and conventional hazards is covered under section 3.3 of CMD 20-H4 [1]. However, in the context of the Federal Lands Review, potential impacts to workers are briefly mentioned in section 3.2.5.2, with the associated mitigation measures being presented in section 3.2.5.3.

3.2.5.1 Effects on Public Health

The proposed decommissioning activities at the DPWF are not expected to have effects on the health of persons residing near the DPWF.

Bruce Power's 2017 ERA evaluated the risk to off-site receptors from releases (radiological and hazardous) from the Bruce nuclear site, including the DWMF. As outlined in sections 3.1.1 and 3.1.2, waterborne and airborne releases from the DPWF (both radiological and hazardous) have remained well below regulatory limits, indicating that the sources of contamination have been

negligible thus far, and are not expected beyond the DPWF footprint. The results of the HHRA conducted as part of CNL's 2019 ERA [12] concluded that there is no undue risk to off-site human receptors from exposure to radiological and hazardous contaminants⁴ resulting from current conditions at the DPWF.

3.2.5.2 Effects on Workers' Health

The proposed decommissioning activities at the DPWF have the potential to expose workers to conventional and radiological hazards (e.g., noise, exposure to small quantities of hazardous materials and radioactive particulates). More information on CNSC's regulatory oversight of radiation protection and conventional health and safety is provided in CNSC staff's CMD 20-H4 [1].

3.2.5.3 Mitigation measures

Regarding effects on public health, no mitigation measures are needed given that the proposed decommissioning activities are not expected to have effects on the health of persons residing near the DPWF.

Regarding effects on workers' health, CNL commits to keeping radiation doses to workers ALARA and below regulatory limits through adherence to the Radiation Protection Program implemented at the DPWF. Risks to workers from conventional/industrial hazards and hazardous material are to be minimized through adherence to CNL's Occupational Health and Safety Program.

CNL has measures in place to mitigate potential effects on workers' health through operational and administrative controls, including the use of personal protective equipment, ventilation of enclosures, and dust suppression. These mitigation measures are summarized in table 3.5 (in section 3.2.7).

CNSC staff will verify that all required mitigation measures are incorporated into the individual DDPs at each planning phase and are effectively implemented before project activities can begin.

3.2.5.4 Conclusion

Based on the assessment of effects on the human environment, CNSC staff conclude that the proposed decommissioning activities are not likely to cause significant adverse effects on the health of workers and members of the public provided that appropriate mitigation measures are implemented. In addition, CNSC staff conclude that CNL has and will continue to provide adequate protection of people and the environment.

3.2.6 Environmental Effects with Respect to Indigenous Peoples

An assessment of potential effects on Indigenous peoples consists of assessing whether the proposed decommissioning activities could result in environmental effects, in accordance with section 5 of CEAA 2012 [15], from any change that may be caused to the environment on:

⁴ Radiological COPCs included tritiated water (HTO), noble gases, C-14, mixed fission product iodines, gross alpha radionuclides and gross beta/gamma radionuclides. No chemical COPCs were screened in because they were either not detected in the environment or were below federal or provincial guidelines/standards.

- health and socio-economic conditions
- physical and cultural heritage
- the current use of lands and resources for traditional purposes
- any structure, site or thing that is of historical, archaeological, paleontological or architectural significance

While CNSC's Indigenous consultation process for this licence application is described in section 4.1 of CMD 20-H4 [1] and summarized in Appendix 1: Environmental Effects Evaluation Form, this section of the report assesses the above-listed potential environmental effects in relation to Indigenous peoples (together referred to as Indigenous interests) in the context of the Federal Lands Review (see section 2.1.1).

The DPWF lies within traditional territory of the following Indigenous groups:

- Chippewas of Nawash Unceded First Nation and Saugeen First Nation, who together form Saugeen Ojibway Nation (SON)
- Métis Nation of Ontario (MNO)
- Historic Saugeen Métis (HSM)

3.2.6.1 Effects with respect to Indigenous peoples

CNSC staff's effects assessments conducted for previous environmental components (sections 3.2.1 to 3.2.3) indicate that the receiving environment (air, surface water, sediment, groundwater and soil) near the DPWF remains safe to use by Indigenous groups and community members or citizens for traditional purposes (e.g., hunting, fishing, trapping) near the DPWF. All potential impacts, if any, are expected to occur within the fenced and controlled Bruce nuclear site, which restricts access to the land. As demonstrated in sections 3.1.1 and 3.1.2, waterborne and airborne releases from the DPWF (both radiological and hazardous) have remained well below regulatory limits between 2014 and 2018, during which time CNL performed authorized hazard reduction activities (e.g., removal of hazardous materials, removal of some non-nuclear structures and buildings, etc.). This indicates that the sources of contamination have been negligible thus far, and are not expected beyond the DPWF footprint for the proposed decommissioning activities, given that they are similar in nature to the previously completed hazard reduction work.

Furthermore, the implementation of mitigation measures proposed by CNL for the environmental components described in earlier sections of this report, will ensure that any potential adverse environmental effects, while negligible, are avoided or further reduced and controlled. Therefore, the proposed decommissioning activities at the DPWF are not expected to have environmental effects with respect to rights and interests of Indigenous peoples in the vicinity of the DPWF.

3.2.6.2 Mitigation measures

No mitigation measures are proposed given that the proposed decommissioning activities are not expected to have any potential environmental effects, as defined by CEAA [15], with respect to the rights and interests of Indigenous peoples in the vicinity of the DPWF. CNSC staff continue to consult and engage with identified Indigenous groups to ensure that any concerns raised with respect to the proposed decommissioning activities are adequately addressed on a continuous basis.

3.2.6.3 Conclusion

CNSC staff conclude that the proposed decommissioning activities are not likely to cause significant adverse environmental effects on the health and socio-economic conditions of Indigenous peoples, their physical and cultural heritage, and current traditional land and resource use, as well as any structure, site or thing that is of historical, archaeological, paleontological or architectural significance. For more information on CNSC's approach to consultation and engagement with regards to this licence amendment application, please see section 4.1 of CMD 20-H4 [1] and Appendix 1: Environmental Effects Evaluation Form.

3.2.7 Summary of Mitigation Measures

Table 3.5 summarizes all mitigation measures that CNL has proposed or committed to in order to avoid, minimize or control any of the potential adverse environmental effects presented in sections 3.2.1 to 3.2.6. CNSC staff will verify that all necessary mitigation measures are incorporated into the individual DDPs at each planning phase and are adequately implemented through CNL's programs, before project activities can begin.

Taking into account all proposed mitigation measures and their proper implementation, CNSC staff conclude that the proposed decommissioning activities are not likely to cause significant adverse effects on the environment and the people at or around the DPWF.

Table 3.5: Proposed mitigation measures per environmental component

Environmental component	Potential environmental effect	Proposed mitigation measure
Atmospheric environment Air quality	Generation of radioactive and hazardous particulates from the removal of equipment and hazards, and the dismantlement of buildings	Use of standard dust control measures (e.g., dust suppression, isolation of work areas, use of enclosures and air filtration units)
		Use of fixatives to seal contamination to surfaces
		Adherence to CNL’s procedure for controlling asbestos hazards
		Continue with radiological air monitoring to verify contamination levels ^[1] Note: this measure applies to the two effects below as well
	Generation of radioactive particulates from the removal of contaminated soil	Use of dust suppression measures, such as limiting work during high winds and using a water mist system to control airborne particulates
	Generation of radioactive particulates from the transportation of wastes to storage/disposal sites	Use of dust suppression measures, such as covering soil loads with tarps and using CNSC-approved packages and containers for transportation
		Adherence to CNL’s Waste Management Plan for packaging requirements
Atmospheric environment Noise	Noise generation (all activities)	Adherence to appropriate hearing protection standards for onsite staff
		Use of sound barriers, as required

Environmental component	Potential environmental effect	Proposed mitigation measure
Hydrological environment Surface water quality and sediment quality	Release of radioactive and hazardous contaminants to Lake Huron via suspended solids in storm water runoff	Removal of fixed and/or loose contamination before the dismantlement of buildings and structures (to the point where the criteria for unrestricted land use are fully met)
		Continue with diversion of storm water runoff away from buildings and structures to prevent water contamination through infiltration (as part of the Inactive Drainage System)
		Consideration of additional barriers, such as berms, dikes and silt fences, in accordance with CNL's procedure for the management of land, habitat and wildlife
		Continue with radiological effluent monitoring to verify contamination levels ^[1]
Hydrogeological environment Groundwater quality	Spread of radioactive and hazardous contaminants via groundwater and surface water due to groundwater seepage during removal of underground services	Continue with diversion of groundwater ingress away from structures and buildings to prevent water contamination through infiltration (as part of the Inactive Drainage System)
		Conduct of supplementary assessments to better understand the current water table conditions and re-evaluate the need for additional measures to better manage potential groundwater seepage (as part of the planned implementation of CSA N288.7-15)
Terrestrial environment Soil quality	Spread of radioactive and hazardous contaminants from contaminated soil encountered during excavation and remediation work	Conduct of soil monitoring prior to excavation activities to check for contamination and confirm levels meet the acceptability criteria for unrestricted land use
		Removal of contaminated soil and selection of appropriate disposal method in accordance with CNL's Waste Management Plan
		Use of standard mitigation measures (e.g., tarps to cover any contaminated soil), as required
Terrestrial environment Species at risk	Loss of nesting sites for Barn Swallows	Conduct of surveys to check for Barn Swallow nests prior to removing any building or structure during decommissioning work
		Consideration of any preventive measures recommended by ECCC (e.g., use of exclusive measures to discourage nesting) for the protection of Barns Swallows following the <i>2017 Best Management Practices for Excluding Barn Swallows and Chimney Swifts from Buildings and Structures</i> from the Ontario Ministry of Natural Resources and Forestry [46]

Environmental component	Potential environmental effect	Proposed mitigation measure
		If active Barn Swallow nests are detected, follow ECCC's advice to avoid harm to migratory birds [47]
Human health environment Workers health	Exposure to conventional hazards and contamination from radioactive and hazardous materials	Adherence to CNL's Occupational Health and Safety Program
		Adherence to CNL's Radiation Protection Program
		Use of operational control measures (e.g., dust suppression, air sampling, ventilation of enclosures, fixatives)
		Continue with monitoring of radiation doses to workers

[1] CNSC staff will evaluate whether the existing effluent monitoring plan (that is part of the EVMP for the DPWF) needs to be enhanced, before any decommissioning activities can begin.

4.0 CNSC INDEPENDENT ENVIRONMENTAL MONITORING PROGRAM

The CNSC has implemented its IEMP to verify that the public and the environment around licensed nuclear facilities are protected. It is separate from, but complementary to the CNSC's ongoing compliance verification program. The IEMP involves taking samples from public areas around the facilities, and measuring and analyzing the amount of radiological and hazardous contaminant substances in those samples. CNSC staff collect the samples and send them to the CNSC's laboratory for testing and analysis.

4.1 IEMP at the Bruce Nuclear Site

CNSC staff conducted IEMP sampling around the Bruce nuclear site, which encompasses the DPWF, in 2013, 2015, 2016 and 2019. Staff developed site-specific sampling plans focused on radiological and hazardous contaminants, and based on Bruce Power's site-wide EMP and CNSC's regulatory knowledge of the site.

In 2019, for the most recent campaign, CNSC staff collected the following samples in publicly accessible areas outside the perimeter of the Bruce nuclear site:

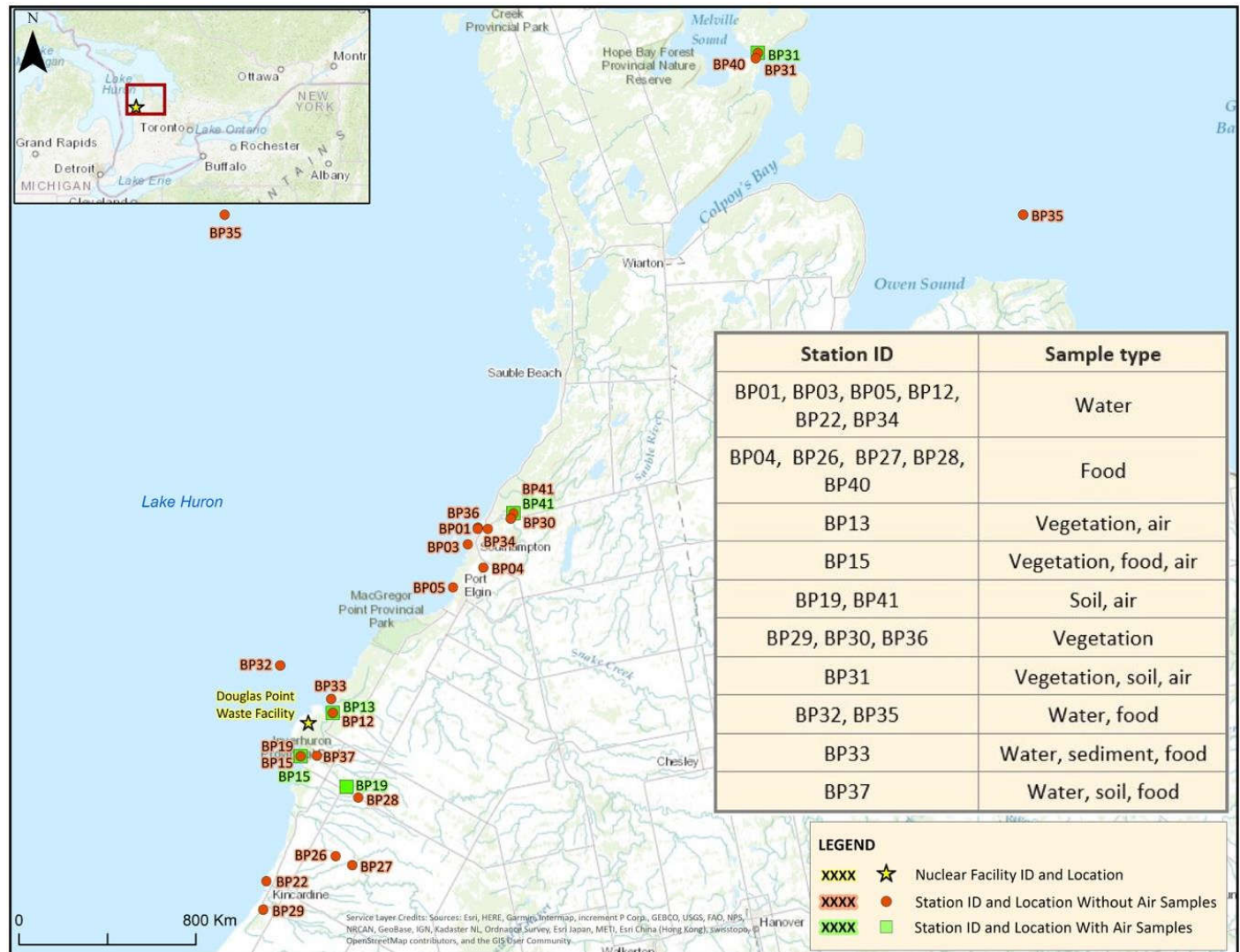
- air (5 locations)
- water (10 locations)
- soil and sediment (5 locations)
- grass and wild vegetation (7 locations)
- food (12 locations)

Samples collected were analyzed by qualified laboratory specialists in the CNSC's laboratory in Ottawa, using appropriate protocols. CNSC staff measured radioactive particulates, including

cesium-137, cobalt-60, organically bound tritium, tritiated water, gross alpha and gross beta, in the collected samples.

Figure 4.1 provides an overview of the sampling locations for the 2019 IEMP sampling campaign at the Bruce nuclear site. The IEMP results are published on the [CNSC's website](#) [48].

Figure 4.1: Overview of the 2019 sampling locations [48]



4.2 Participation of Indigenous Peoples in the IEMP

It is a priority for the CNSC that IEMP sampling reflects Indigenous traditional land use, values and knowledge, where possible. In addition to routine IEMP sampling activities, the CNSC collaborated with three local Indigenous groups in 2019: SON, HSM and MNO.

In advance of sampling, notification emails were sent to all Indigenous groups near the Bruce nuclear site, inviting suggestions for locations, species of interest or valued components. Upon receipt of each group's list of suggestions, the following four medicinal plants were chosen as

they were commonly identified by all three groups: plantain, eastern white cedar, balsam fir and cat tails. These four plants were sampled at locations near the Bruce nuclear site, as well as at a reference location nearby.

CNSC staff shared community-specific information in advance of publishing the 2019 results on the IEMP website and will notify communities of such publication. CNSC staff are also discussing the results at community meetings.

The following sections summarize CNSC staff's collaboration with each Indigenous group during the 2019 sampling campaign.

4.2.1 Sampling with the Saugeen Ojibway Nation

CNSC staff held community meetings in both Saugeen and Nawash to hear the concerns of the communities, as well as request assistance with fish sampling. To this effect, two local fishermen were selected from the community by the SON's acting Environment Office Manager.

CNSC's Participant Funding Program was used to support fish, water and sediment sampling at four locations (refer to figure 4.1 for a visual representation):

- Lake Huron, offshore from the Bruce nuclear site (BP32)
- Lake Huron, Baie du Doré (BP33)
- Saugeen River (BP34)
- Lake Huron, "Twelfth Fathom Bank", offshore from Nawash to the East (BP35)

CNSC staff accompanied the SON fishermen to assist with fish sampling and ensure that proper sampling procedures and chain-of-custody were used. While no fish were caught in the Saugeen River, CNSC staff were told that this was typical for this river given the time of year.

Air, soil and traditional plants were also sampled in each community (Nawash and Saugeen). Community members were invited to visit the air sampling station to ask questions and observe how CNSC staff used the equipment.

In August 2019, CNSC staff also participated in a hike with a SON elder and the building of a friendship fire.

4.2.2 Sampling with the Historic Saugeen Métis

The HSM provided CNSC staff with a list of species of interest. CNSC staff met with HSM representatives to discuss the IEMP, as well as to select plants to sample and discuss locations. HSM representatives offered CNSC staff a tour of their traditional medicine garden located at a residence of historical significance in Southampton. CNSC staff took samples of the four medicinal plants (referenced above) near the Bruce nuclear site and at a reference location nearby. Cedar was also sampled at the traditional medicine garden. The HSM were also interested in the samples taken at a local farm, as it is where many members of the community purchase their produce. Sampling of wild leek was also considered, but HSM representatives decided against it since the required harvesting would not be sustainable (i.e., the amount present in the wild is quite small and sampling required picking a large amount of the available wild leek).

CNSC staff demonstrated to HSM community members how sampling of cedar is carried out and walked them through the chain-of-custody process at the local garden. The HSM participants had many questions on sampling and lab procedures, which CNSC staff addressed during the visit.

4.2.3 Sampling with the Métis Nation of Ontario

CNSC staff consulted the valued components report provided by the MNO to include traditional plants of significance to them into the sampling campaign. CNSC staff took samples of the four medicinal plants (referenced above) near the Bruce nuclear site and at a reference location. Furthermore, two MNO community members accompanied CNSC staff for a half-day sampling trip, mainly at Baie du Doré. The MNO participants assisted CNSC staff with species identification and observed CNSC sampling procedures.

4.3 Summary of Results

The levels of radioactivity in all 2013, 2015, 2016 and 2019 samples were below available guidelines and CNSC screening levels. The 2013, 2015 and 2016 results are available on [CNSC's website](#) [48], with the 2019 results expected to be available before the Commission hearing.

The IEMP results indicate that the public and the environment in the vicinity of the Bruce nuclear site, including the DPWF, are protected and that there are no expected health impacts. These results are consistent with those submitted by CNL, demonstrating that the licensee's EP program protects the health and safety of people and the environment.

5.0 HEALTH STUDIES

The following section draws from the results of regional health studies, reports and other studies to provide further independent verification that the health of people living near the DPWF is protected. The health of populations around the Bruce nuclear site (encompassing the DPWF, Bruce Power Nuclear Generation Stations and Western Waste Management Facility) are monitored by various organizations and institutions in Ontario. Disease rates are also compared to those of other populations to detect any potential health outcomes that may be of concern.

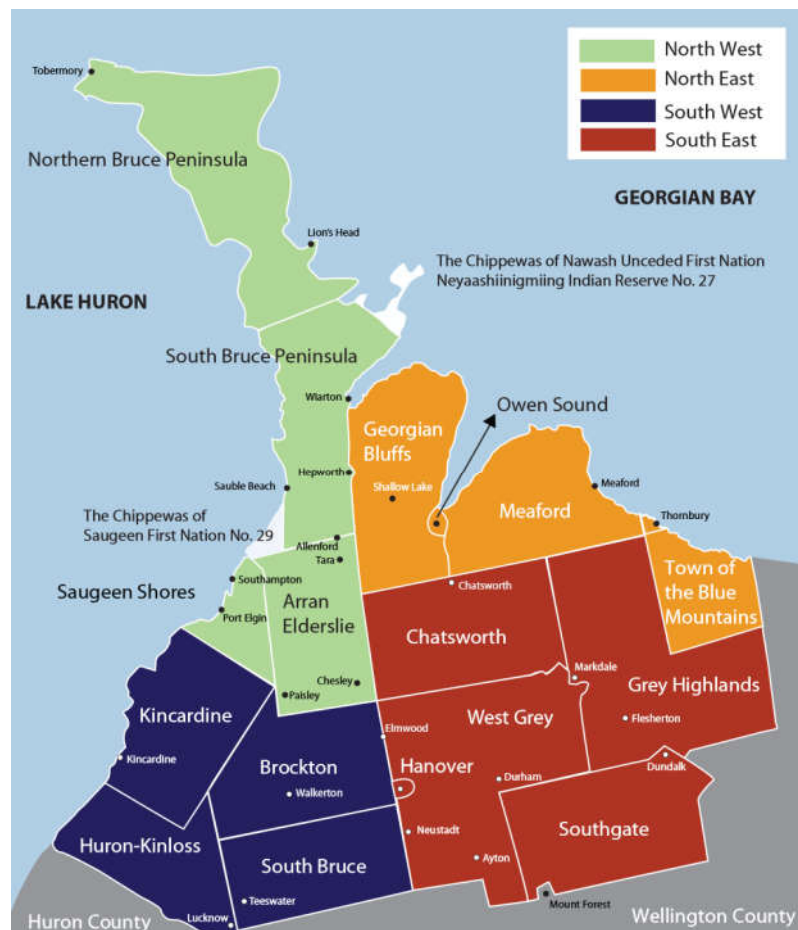
CNSC staff carefully monitor and conduct health studies to ensure the protection of human health. CNSC staff also keep abreast of any new publications related to the health of populations living near nuclear facilities. Additional information on health studies related to nuclear facilities is available on [CNSC's Health Studies webpage](#) [49].

The following sections provide a list of health studies and reports carried out in the region where the DPWF is located, as well as other relevant studies.

5.1 Population and Community Health Studies and Reports

5.1.1 Grey Bruce Health Unit Reports

The Grey Bruce region encompasses the Bruce nuclear site, which includes the DPWF. It is comprised of the Grey and Bruce counties, which include the Bruce Peninsula and its surrounding area, as illustrated in figure 5.1.

Figure 5.1: Map of the Grey Bruce region [50]

5.1.1.1 Grey Bruce Healthy Community Picture – 2014 Supplement

The Grey Bruce Health Unit publishes [reports](#), which examine health outcomes and factors that affect the health of people living in areas serviced by the Grey Bruce Health Unit [51]. According to the [Grey Bruce Healthy Community Picture – 2014 Supplement](#), the leading causes of death in 2005 were cardiovascular disease and cancer representing 58.9% of all deaths [52]. This is consistent with the rest of Ontario for the same time period where cancer and heart disease accounted for 58% of deaths [53]. The age-standardized death rate in 2005 for Grey Bruce was significantly higher than that of Ontario. The rates for cardiovascular disease, cerebrovascular disease (e.g., stroke), colorectal cancer, unintentional injuries and self-inflicted injuries were statistically significantly higher than that of the rest of Ontario.

This report also summarizes data on risk factors for health outcomes, including cancer. According to the report, the rate of overweight in 2011/2012 was 37% or 1 in 3 people, which is significantly higher than that of Canada (34%); whereas the rate of obesity was higher than that of Ontario and Canada, but not significantly. Overweight and obesity are well-known risk factors for cardiovascular disease, stroke, colorectal cancer and other diseases and the prevalence of these and other risk factors in the community may explain the higher rates of cardiovascular disease, cerebrovascular disease, and colorectal cancer.

5.1.1.2 The Cancer in Grey Bruce Report (2014)

The [Cancer in Grey Bruce Report](#) (2014) provides an overview of cancer incidence and mortality [54]. The most diagnosed cancers in Grey Bruce from 2000 to 2009 are prostate (34% in males), lung (13%), colorectal (13%) and breast cancer (25.6% in females), which is consistent with the most prevalent cancers in Ontario [55]. The overall Grey Bruce cancer incidence rate has not changed significantly between the periods of 1990 to 1999 and 2000 to 2009 for either sex, and is not significantly different among males between Grey Bruce and Ontario. However, the cancer incidence rate for Grey Bruce females is significantly lower (352.7 per 100 000 population with a 95% confidence interval (CI) of 341.1 to 364.7) than the rate for Ontario females (365.4 per 100 000 population with a 95% CI of 364.0 to 366.8). The cancer incidence rate for Bruce County is 8% higher than that of Grey County for the period of 2000 to 2009.

The Grey Bruce cancer mortality rate for both sexes decreased from the period of 1990 to 1999 to the period of 2000 to 2009 due to the decreasing male rate. Despite this reduction, the Grey Bruce area has a 6% higher mortality rate compared to Ontario, which is driven predominantly by the 10% higher female rate. The cancer mortality rate for males in Grey Bruce is 32% higher than for females. The cancer mortality rate for Bruce County is 17% higher than that of Grey County.

5.1.1.3 Canadian Community Health Survey Indicators for Grey Bruce (2015-2016)

In 2018, the Grey Bruce Health Unit published the [Canadian Community Health Survey Indicators for Grey Bruce 2015/16](#), which summarizes data from the Canadian Community Health Survey [56]. It reports on health indicators, such as general health, chronic conditions (e.g., body mass index, diabetes), risk and protective behaviour (e.g., smoking and alcohol consumption), nutrition, early childhood and contact with medical services.

Chronic Conditions

Grey Bruce residents have significantly higher rates of hypertension (21% with a 95% CI of 17.7 to 24.6) compared to Canadians (17.3% with a 95% CI of 17.0 to 17.6), but have similar rates of hypertension as Ontario (18.2% with a 95% CI of 17.6 to 18.8). They are no more or less likely to be overweight than Ontarians and Canadians; however, they are more likely than Ontarians and Canadians to be obese.

Smoking, Alcohol and Physical Activity

Grey Bruce residents were no more or less likely to be current smokers or daily smokers than Canadians and Ontarians (see table 5.1). They are more likely to be heavy drinkers than Ontarians, especially males and residents aged 35 to 49 (see table 5.1). They are also no more or less likely to meet physical activity guidelines than Ontarians or Canadians, with the exception of those aged 35 to 49, who are more likely to meet these guidelines. Caution is recommended when interpreting these rates since small sample sizes can result in less precise CIs.

Table 5.1: Select risk behaviour rates for the Grey Bruce Health Unit, in Ontario and Canada [56]

Risk behaviour	Grey Bruce Health Unit [95% CI]	Ontario [95 % CI]	Canada [95 % CI]
Current smokers	17.0% [14.0-20.6]	16.7% [16.0-17.5]	17.4% [17.0-17.7]
Daily smokers	13.7% [11.2-16.8]	11.9% [11.3-12.5]	12.4% [12.0-12.7]
Heavy drinkers	21.5% [18.7-24.6]	18.2% [17.5-18.9]	19.1% [18.7-19.5]
Male heavy drinkers	29.9% [25.4-34.8]	23.3% [22.2-24.4]	21.4% [20.6-22.3]
Heavy drinkers aged 35 to 49	29.4% [22.5-37.4]	19.0% [17.5-20.6]	21.4% [20.6-22.3]

5.1.2 Public Health Ontario Data

Public Health Ontario publishes interactive map-based [dashboards](#), which display how key public health indicators like cancer incidence and mortality vary across the province over the years [57].

Cancer incidence for the Grey Bruce Health Unit in 2014 was higher, but not significantly, than the provincial average. The cancer mortality rate was not significantly different than that of Ontario from 2014 to 2015.

Overall, the mortality rate for cardiovascular disease within Grey Bruce was significantly higher than the Ontario rate from 2003 to 2015. However, overall rates were similar to sparsely populated urban-rural mix and mainly rural populations. This may be the result of a higher frequency of cardiovascular disease risk factors observed in rural areas (e.g., smoking, obesity, physical inactivity, diabetes, hypertension or high cholesterol) [58][59][60][61].

5.1.3 Cancer Care Ontario Data

In 2018, Cancer Care Ontario published [cancer incidence and mortality statistics](#) by public health unit for the years between 2011 and 2013 [55]. The cancer incidence rate for colorectal and lung cancers in males in Grey Bruce was significantly higher than that of the rate in the general Ontario population. The cancer mortality rate for all cancers combined for males is significantly higher compared to the general Ontario population, including the mortality rate for lung cancer.

5.2 Studies of Radiation Health Effects – Living Near or Working in Nuclear Facilities

The current scientific knowledge about the sources, effects and risks of ionizing radiation is reviewed and published by the international experts that make up the United Nations Scientific Committee on the effects of Atomic Radiation (UNSCEAR). This knowledge in turn informs the recommendations of the International Commission on Radiological Protection (ICRP), which are focused on the protection of human health. The epidemiological evidence of radiation-related health effects comes from several main research populations. These include the atomic bomb survivors, people involved in the Chernobyl disaster, patients treated with radio-therapy for cancer and non-cancer diseases, miners exposed to radon and radon decay products and nuclear

energy workers. Two major findings of these studies are: 1) the excess risk of cancer increases as the radiation dose increases, and 2) statistically significant population effects are only observed at doses above 100 mSv, which are much higher than the natural background (as a reference, the annual Canadian average background is 1.8 mSv [62]).

Although focused on nuclear power plants, the following health studies are relevant to the DPWF given that it houses the permanently closed and defueled Douglas Point Nuclear Generating Station (which operated from 1968 to 1984), and is surrounded by the Bruce A and B Nuclear Generating Stations.

5.2.1 RADICON

The Radiation and Incidence of Cancer Around Ontario Nuclear Power Plants from 1990 to 2008 study (or the [RADICON](#) study), conducted by the CNSC, determined the radiation doses to members of the public living within 25 kilometers of the Pickering, Darlington and Bruce nuclear power plants, and compared cancer cases among these people with the general population of Ontario from 1990 to 2008 [63].

The study mainly found that there was no evidence of childhood leukemia clusters around the three Ontario nuclear power plants, and no consistent pattern of cancer across the populations in question. Some types of cancer were higher than expected, but in other cases they were lower or no different. Although this study detected variations in all cancers combined and radiosensitive cancers, the pattern was found to be within the natural variation of cancer in Ontario.

5.2.2 Nuclear Workers

Many studies have looked at the health of nuclear workers. An analysis of 42 228 Canadian nuclear workers provided no evidence of increased risk of cancer mortality between 1964 and 1994. Canadian workers had lower all-cause and solid cancer mortality compared to the general Canadian population [64]. INWORKS, a multinational cohort study, assessed cancer mortality from 1943 to 2005 in 308 297 workers from the nuclear industry in France, the United Kingdom and the United States [65]. The study found non-significant associations within a range of 100 mSv for solid cancer and 300 mSv for non-chronic lymphocytic leukaemia. The results were consistent with one of the assumptions underlying the current radiation protection system, whereby the risk is proportional to dose.

5.2.3 Other Types of Evidence

In addition to epidemiological evidence, radiobiological evidence is also analyzed to provide biological plausibility to the epidemiology, and inform how the CNSC regulates. In 2017, CNSC staff produced a CMD entitled *Biological mechanisms acting at low doses of radiation* [66] and published its findings in the peer-reviewed scientific literature [67]. Its main finding was that the experimental evidence reviewed (e.g., cell and animal studies) did not support a deviation from the current radiation protection framework with regards to the risks associated with low doses of radiation.

For more information on radiation health effects, please visit [CNSC's website](#) [68].

5.3 Summary of Health Studies

Reviewing and conducting health studies and reports is an important component of ensuring that the people living near or working in nuclear facilities are protected. The population and community health studies and reports indicate that common causes of death among the Grey Bruce populations include heart disease and cancer.

This is similar to the rest of Canada, where heart disease and cancers are the two leading causes of death [53]. Major health risk factors, such as smoking, poor diet and physical inactivity, may account for the occurrence of these diseases within the Grey Bruce populations. The higher rates of cardiovascular disease, cerebrovascular disease and colorectal cancer may be the result of differences in lifestyle.

"Colorectal cancer is associated with high meat - red meat and processed meat and high salt diets". – Dr. Hazel Lynn, Medical Officer of Health for Grey-Bruce Health Unit (2013) [69].

Some of the above-mentioned health studies are descriptive studies, meaning that they compare the occurrence of health outcomes within a population at a certain time in a given geographical area to the “expected” occurrence of the disease in a stable reference population (such as the general population of the province or country). Descriptive studies have some limitations. For example, the results are averaged over a group and do not look at the individual level, or individual exposures are unknown, and therefore, they cannot be used to determine the cause of a health outcome. Descriptive studies are still used to generate hypotheses regarding potential risk factors for health outcomes. Further information regarding the advantages and disadvantages of health study designs are available in CNSC’s publication titled: [*Setting radiation requirements on the basis of sound science: the role of epidemiology*](#) [70].

Other studies can be experimental, meaning that potential health effects are assessed by exploring their underlying biological mechanisms. These types of studies also come with limitations. For example, the results from animal or cell studies cannot be easily extrapolated to humans, or the circumstances of the study are unrealistic (e.g., cell cultures may not be representative of a particular tissue in an organism). Experimental studies are nevertheless very informative.

The health studies and reports presented in this section provide a snapshot of the health of people living near the DPWF. Based on the assessed exposure and health data, CNSC staff have not observed and do not expect to observe any adverse health outcomes attributable to the DPWF.

6.0 OTHER REGIONAL MONITORING PROGRAMS

Several regional monitoring programs are carried out by other levels or bodies of government, and are reviewed by CNSC staff to confirm that the environment and the health of persons around the facility in question are protected. A summary of the findings of these programs is provided below.

6.1 Health Canada's Canadian Radiological Monitoring Network and Fixed Point Surveillance Program

The Radiation Protection Bureau of Health Canada manages the [Canadian Radiological Monitoring Network \(CRMN\)](#) [71]. The CRMN routinely collects drinking water, precipitation, atmospheric water vapour, air particulate, and external gamma dose for radioactivity analysis at 26 monitoring locations. The closest CRMN monitoring location to the DPWF is in Toronto. The results at the Toronto station for 2019 are consistent with data from previous years and are well below the public dose limit of 1 mSv per year.

In addition, Health Canada has complemented the CRMN with a [Fixed Point Surveillance \(FPS\)](#) system [71]. The FPS functions as a real-time radiation detection system designed to monitor public dose from radioactive materials in the air, including atmospheric emissions associated with nuclear facilities and activities both nationally and internationally. Monitoring stations continuously measure gamma radioactivity levels from ground-deposited (ground-shine) and airborne contaminants.

Health Canada measures the radiation dose rate as Air KERMA (Kinetic Energy Released in unit Mass of Material) reported as nanogray per hour (nGy/h) of absorbed dose. These measurements are conducted every 15 minutes at 79 sites of its FPS network across the country. Air KERMA is also measured for three radioactive noble gases associated with nuclear fission, which may escape into the atmosphere during normal operation of nuclear facilities. These three noble gases are argon-41, xenon-133 and xenon-135. CNSC staff converted the absorbed dose rate to an effective dose, reported in mSv per year, which allows for comparison to annual background dose estimates and the regulatory public dose limit.

The 2019 total external gamma doses reported for the FPS network at the eight locations near the DPWF are similar to the Canadian average for natural background from gamma (the range is 0.007 to 0.027 mSv per year). These results indicate that total external gamma dose at these stations is not significantly influenced by activities at the DPWF. Further evidence of this is provided by the extremely low activity levels reported for the noble gases, as outlined in table 6.1. All of the results are significantly below the public dose limit of 1 mSv per year.

There were several months of data that were not collected at the Scott Point, Kincardine and Port Elgin stations due to a problem with the equipment or data transfer. Since these stations are located far away from the site's boundary, which is the closest monitoring location to the DPWF, it is expected that the actual total external gamma dose is less than 0.014 mSv per year and within background levels.

Table 6.1: Annual external gamma doses (mSv/year^[1]) for 2019 at the FPS network monitoring stations near the DPWF [72]

Monitoring stations near DPWF	External gamma dose (mSv/year)			
	All gamma sources	Monitored noble gases (fission products)		
		Argon-41	Xenon-133	Xenon-135
Site boundary	0.014	0.0000004	*	*
Scott Point ^[2]	0.009	*	*	*
Kincardine ^[3]	0.007	*	*	*
Inverhuron	0.011	*	*	*
Port Elgin ^[4]	0.006	*	*	*
Infocentre	0.017	*	*	*
Tiverton ^[2]	0.014	*	*	*
Shore Road	0.011	*	*	*

* No data is reported when results were below the minimum detectable dose.

[1] Assumptions: Adult located at monitoring station for 24 hours a day, 365 days per year. Air KERMA in nanoGray corrected. Total Dose: 0.69 Sv for every Gray of absorbed dose measured. Argon-41: 0.74; Xenon-133: 0.75; Xenon-135: 0.67.

[2] March 2019 data was not collected at the Scott Point station due to a problem with the equipment or data transfer.

[3] January, February, March, April, and June 2019 data were not collected at the Kincardine station due to a problem with the equipment or data transfer.

[4] May, June, July, August, and September 2019 data were not collected at the Port Elgin station due to a problem with the equipment or data transfer.

6.2 Municipal Drinking Water Systems

The Province of Ontario, through ECCC, regulates municipal drinking water systems to ensure water safety and quality. Provincial standards require that municipalities test many parameters, including radiological substances and chemicals, which may be related to the nuclear industry. Municipalities are required to report the results annually. CNCS staff reviewed the 2018 annual report results from [Saugeen Shores drinking water system](#) [73] and the [municipality of Kincardine drinking water system](#) (i.e., Armow, Kincardine, Scott Point, Tiverton, and Underwood) [74], and concluded that the results are below drinking water guidelines.

7.0 RECOMMENDATIONS AND CONCLUSIONS

CNSC staff reviewed CNL's licence application and the documents submitted in support of the application, such as the DDP, EER, ERA and Annual Compliance Monitoring Reports. CNSC staff conclude that the licence application and supporting documents submitted in support of the application are satisfactory and meet CNSC's regulatory requirements, with respect to EP.

This EPR focused on items of current public and regulatory interest, including airborne and waterborne releases from ongoing activities and from the proposed decommissioning activities at the DPWF. Taking into account all proposed mitigation measures and their proper implementation, CNSC staff conclude that the potential risk from physical stressors and radiological and hazardous releases to the atmospheric, terrestrial, hydrogeological, aquatic and human environments are low to negligible.

The EPR conducted for the licence application to amend CNL's WFDL for the DPWF concludes that CNL has and will continue to make adequate provision for the protection of the environment and the health of persons. CNSC staff will continue to verify and ensure that, through ongoing licensing and compliance activities and reviews, the environment and the health of persons are protected and will continue to be protected over the proposed licence period.

In addition, CNSC staff reviewed the results from regional monitoring programs conducted by other levels or bodies of government. CNSC staff also conducted IEMP sampling around the Bruce nuclear site, which encompasses the DPWF, in 2013, 2015, 2016 and 2019. Both the regional monitoring results and IEMP results confirm that the public and the environment around the DPWF are protected and that there are no health impacts as a result of ongoing activities. These results are consistent with the results submitted by CNL, demonstrating that the licensee's EP program protects the health of persons and the environment.

CNSC staff's expectation is that CNL implement the mitigation measures summarized in section 3.2.7 of this EPR Report. As part of CNSC staff's compliance reviews, staff will verify that all required mitigation measures are incorporated into the individual DDPs at each planning phase and are effectively implemented before project activities can begin.

CNSC staff have also determined and recommend to the Commission, in accordance with section 67 of CEAA 2012, that the carrying out of the proposed project is not likely to cause significant adverse environmental effects provided that appropriate mitigation measures are implemented.

The information provided in this EPR Report supports the recommendation by CNSC staff in CMD 20-H4 [1] to amend CNL's WFDL for the DPWF (WFDL-W4-332.02/2034).

ACRONYMS

Acronym	Term
AECL	Atomic Energy Canada Limited
ALARA	As Low As Reasonably Achievable
Bq/yr	Becquerels per year
C-14	Carbon-14
CANDU	Canada deuterium uranium
CEAA	<i>Canadian Environmental Assessment Act</i>
CEPA	<i>Canadian Environmental Protection Act</i>
CI	Confidence interval
CMD	Commission Member Document
CNL	Canadian Nuclear Laboratories
CNSC	Canadian Nuclear Safety Commission
CO ₂ e	CO ₂ equivalent
COPC	Contaminant of potential concern
CRMN	Canadian Radiological Monitoring Network
DDP	Detailed Decommissioning Plan
DPWF	Douglas Point Waste Facility
DRL	Derived release limit
EA	Environmental Assessment
ECCC	Environment and Climate Change Canada
EcoRA	Ecological Risk Assessment
EER	Environmental Effects Review
EMP	Environmental Monitoring Program
EP	Environmental protection

EPR	Environmental Protection Review
ERA	Environmental Risk Assessment
ESA	<i>Endangered Species Act</i>
EVMP	Effluent Verification Monitoring Program
FPS	Fixed Point Surveillance
GHG	Greenhouse gas
Go-Co	Government-owned, Contractor-operated
HHRA	Human Health Risk Assessment
HLW	High-level waste
HTO	Tritiated water
HSM	Historic Saugeen Métis
IA	Impact Assessment
IAA	<i>Impact Assessment Act of Canada</i>
IEMP	Independent Environmental Monitoring Program
ILW	Intermediate-level waste
LCH	Licence Condition Handbook
LLW	Low-level waste
m ³	Cubic meter
MNO	Métis Nation of Ontario
mSv	Millisievert
MT	Metric ton
nGy/h	Nanogray per hour
NPRI	National Pollutant Release Inventory
NSCA	<i>Nuclear Safety and Control Act</i>
PCB	Polychlorinated biphenyl

SARA	<i>Species at Risk Act</i>
SON	Saugeen Ojibway Nation
WFDL	Waste Facility Decommissioning Licence

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- [2] CNSC, WFDL-W4-332.02/2034, *Waste Facility Decommissioning Licence – Douglas Point Waste Facility*, February 8, 2019, [e-doc 5730798](#)
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Appendix 1: Environmental Effects Evaluation Form

Section A: Project identification	
Project title	Phase 3 Decommissioning of the Douglas Point Waste Facility (DPWF)
Project proponent	Canadian Nuclear Laboratories (CNL)
Project location	DPWF, located within the Bruce nuclear site, in Tiverton, Ontario
Lead authority	Canadian Nuclear Safety Commission (CNSC)
Other authorities (if applicable)	Atomic Energy of Canada Ltd. (AECL) is also a federal authority, but CNL on the behalf, is conducting a separate federal lands review for this project
	Environment and Climate Change Canada (ECCC) was consulted for their federal expertise on species at risk

Section B: Description of the environment
<p>The DPWF is located in Tiverton (Bruce County, Ontario), midway between Kincardine and Port Elgin, on the eastern shore of Lake Huron. The DPWF covers an area of 5 hectares and is entirely located within the Bruce nuclear site, which also encompasses Bruce A and B Nuclear Generating Stations.</p> <p>The regional air quality around the Bruce nuclear site is similar to the general air quality for Southern Ontario. Existing noise levels in the area surrounding the site are reflective of a rural sound environment (sound levels are generally less than 50 dBA) and are typically characterized by the sound of nature.</p> <p>The DPWF rests on a geological setting characterized by glacial sediments of varying depths overlying carbonate bedrock laid down on top of the Canadian shield. The land surface is mostly flat with an overburden consisting of beach shingle formed in a series of beaches, sand dunes and gravel, interspersed with some swampy areas. Further inland, the ground rises fairly sharply to a gentle rolling till (clay) plain. Along the Lake Huron shoreline, only a thin layer of glacial sediments exists (beach sand).</p> <p>While groundwater generally flows towards Lake Huron, the groundwater table near the DPWF is strongly influenced by the operation of the Inactive Drainage System sump pumps that surround the foundations of the Reactor and Service Buildings.</p> <p>Land use in the immediate vicinity of the Bruce nuclear site consists primarily of agriculture, recreation and rural residential development. Bruce County contains a number of large forested areas and wetlands, providing core habitat for a variety of wildlife species. Most of the wildlife habitats occur at the periphery of the Bruce nuclear site, specifically in Inverhuron Provincial Park, the Baie du Doré wetland, Lake Huron and its shoreline, and the conifer forests near or along the perimeter fence. Vegetation communities within and around the Bruce nuclear site have a long-standing history of human use and anthropogenic modification, such as logging, farming, recreational use, and the present-day industrial use. The Bruce nuclear site and its surroundings are home to a number of terrestrial and aquatic animals, including mammals, fish, birds, soil invertebrates, reptiles and amphibians. Examples include frogs, turtles, snakes, wild turkeys, gulls, shrews, deer, zebra mussels, bass and whitefish.</p>

Section C: Project description

The Douglas Point site was established in the 1960s in order to operate Canada's first commercial-scale nuclear generating station, the Douglas Point Nuclear Generating Station. This power reactor was commissioned in 1968 and permanently shut down in 1984. Shortly after, spent fuel was transferred from wet storage in the reactor pool to an onsite and dedicated dry storage facility. In 1987, the Douglas Point Nuclear Generating Station was relicensed as a waste management facility and became the DPWF in 2014. CNL took over management of the DPWF in 2015, and although AECL remains the site owner, operations are managed by CNL under a government-owned, contractor-operated model. The facility is currently in the *storage with surveillance* phase of a deferred decommissioning program.

CNL is requesting a licence amendment to begin *phase 3 decommissioning*. The proposed activities include the dismantlement, demolition, waste disposal and site restoration for all non-nuclear buildings and structures (i.e., Turbine Building, Administration Building, Ancillary Facilities, and Steam Bridge), as well as some nuclear buildings and structures (i.e., Purification Building, Service Building, Weld Test Shop, Resin Storage Tanks and Vault). The project also includes clearing-out the Reactor Building. However, the Reactor Building and Spent Fuel Canister Area will not be decommissioned within the requested licence period. Therefore, the proponent is only expected to deal with low-level radioactive waste, hazardous waste, and mixed waste during this proposed project (i.e., no intermediate-level or high-level radioactive waste).

Project phase	Project activities / components
Planning Envelope A: Non-nuclear area	Removal of equipment and systems; dismantlement and/or demolition of buildings and structures, including removal of underground structures to a minimum of one meter below grade; waste segregation, compaction and disposal; site restoration, including grouting to fill the gaps/voids, backfilling and landscaping with clean soil; radiation survey and close-out documentation
Planning Envelope B: Parts of nuclear area (Purification Building, Service Building, and Resin Storage Tanks and Vault)	Decontamination and removal of non-structural components; dismantlement and/or demolition of buildings and structures, including removal of underground structures to a minimum of one meter below grade; waste segregation, compaction and disposal; site restoration, including grouting to fill the gaps/voids, backfilling and landscaping with clean soil; radiation survey and close-out documentation
Planning Envelope C: Reactor Building clear-out	Decontamination, dismantlement and removal of equipment and structures, except the reactor core and its components (e.g., calandria, bio-shield); removal of chemical contaminants, such as asbestos, mercury and polychlorinated biphenyls (PCBs); radiation survey and close-out documentation

Section D: Potential environmental effects

The federal guidance document titled [*Making a determination under section 67 of the Canadian Environmental Assessment Act, 2012*](#) (p. 17) defines “effective and established mitigation measures” (EEMM) as those that meet the following criteria:

- have been implemented before in similar situations
- are well understood and considered reliable
- are ‘avoid’ and ‘reduce’ type mitigation measures (which are different from the ‘repair’ and ‘compensate’ mitigation measures)

Any mitigation measure that does not meet this definition falls under the category “other mitigation measure (MM)” and requires closer analysis and planning.

Biophysical effects			
Does the project have the potential to:	No	Yes, and can be managed through EEMM	Yes, but must be managed through other MM
Harmfully alter, disturb, or destroy vulnerable natural features?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Release a polluting substance into the land, water, or air?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Alter landscape features (e.g., resource extraction, deforestation, clearing of vegetation)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Affect birds and wildlife (flora and fauna), including species at risk and its critical habitat?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Result in alteration of water level, quality, flow or management regime in a water body, or result in other important changes to surface or groundwater resources (including well-water)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cause sensory disturbances, such as noise and/or vibrations?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cause any other change to the environment on federal lands or incidental to a federal decision? If so, specify: N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Indirect effects – Indigenous peoples			
Does the project have the potential to result in changes to the environment that may impact Indigenous peoples, specifically:	No	Yes, and can be managed through EEMM	Yes, but must be managed through other MM
Health and socio-economic conditions (e.g., impact to an Indigenous fishery resulting from a change in fish population)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical and cultural heritage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The current use of lands and resources for traditional purposes (e.g., hunting and gathering)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section E: Mitigation measures	
Section E1: Mitigation measure requirement	
Mitigation measures are required. <i>Proceed to section E2.</i>	<input checked="" type="checkbox"/>
No mitigation measures are required as one or more of the following conditions apply. <i>Skip sections E2 and E3.</i>	<input type="checkbox"/>
Potential impacts are limited to the interior of a facility.	<input type="checkbox"/>
There are no potential adverse biophysical and/or socio-economic effects.	<input type="checkbox"/>

Section G2: Established and effective mitigation measures (EEMM)

The following table summarizes the potential adverse environmental effects, as well as any corresponding EEMM, which will be implemented should the project proceed.

Environmental effect	EEMM
<p>Atmospheric environment – Air quality</p> <p>Generation of radioactive and hazardous particulates from the removal of equipment and hazards, the dismantlement of buildings, the removal of contaminated soil, and the transportation of wastes to storage/disposal sites</p>	<ul style="list-style-type: none"> • Use of standard dust control measures (e.g., dust suppression, isolation of work areas, use of enclosures and air filtration units) • Use fixatives to seal contamination to surfaces • Adherence to CNL's procedure for controlling asbestos hazards • Radiological air monitoring to verify contamination levels • Use of dust suppression measures, such as limiting work during high winds and using a water mist system to control airborne particulates • Use of dust suppression measures, such as covering soil loads with tarps and using CNSC-approved packages and containers for transportation • Adherence to CNL's Waste Management Plan for packaging requirements
<p>Atmospheric environment – Noise</p> <p>Noise generation (all activities)</p>	<ul style="list-style-type: none"> • Adherence to appropriate hearing protection standards for onsite staff • Use of sound barriers, as required
<p>Hydrological environment – Surface water quality and sediment quality</p> <p>Release of radioactive and hazardous contaminants to Lake Huron via suspended solids in storm water runoff</p>	<ul style="list-style-type: none"> • Removal of fixed and/or loose contamination before the dismantlement of buildings and structures (to the point where the criteria for unrestricted land use are fully met) • Diversion of storm water runoff away from buildings and structures to prevent water contamination through infiltration (as part of the Inactive Drainage System) • Consideration of additional barriers, such as berms, dikes and silt fences, in accordance with CNL's procedure for the management of land, habitat and wildlife • Radiological effluent monitoring to verify contamination levels
<p>Hydrogeological environment – Groundwater quality</p> <p>Spread of radioactive and hazardous contaminants via groundwater and surface water due to groundwater seepage during removal of underground services</p>	<ul style="list-style-type: none"> • Diversion of groundwater ingress away from structures and buildings to prevent water contamination through infiltration (as part of the Inactive Drainage System) • Conduct of supplementary assessments to better understand the current water table conditions and re-evaluate the need for additional measures to better manage potential groundwater seepage (as part of the planned implementation of CSA N288.7-15)

Geological environment – Soil quality Spread of radioactive and hazardous contaminants from contaminated soil encountered during excavation and remediation work	<ul style="list-style-type: none"> • Conduct of soil monitoring prior to excavation activities to check for contamination and confirm levels meet the acceptability criteria for unrestricted land use • Removal of contaminated soil and selection of appropriate disposal method in accordance with CNL's Waste Management Plan • Use of standard mitigation measures (e.g., tarps to cover any contaminated soil), as required
Terrestrial and aquatic environment – Species at risk	<ul style="list-style-type: none"> • Conduct of surveys to check for Barn Swallow nests prior to removing any building or structure during decommissioning work • Consideration of any preventive measures recommended by ECCC (e.g., use of exclusive measures to discourage nesting) for the protection of Barn Swallows and their habitat • If active Barn Swallow nests are detected, follow ECCC's advice to avoid harm to migratory birds
Human health environment – Workers health	<ul style="list-style-type: none"> • Adherence to CNL's Occupational Health and Safety Program • Adherence to CNL's Radiation Protection Program • Use of operational control measures (e.g., dust suppression, air sampling, ventilation of enclosures, fixatives) • Monitoring of radiation doses to workers
Section E3: Other mitigation measures	
This section is empty as there are no potential environmental effects associated with mitigation measures that do not meet the definition of 'effective and established' (as explained in section D).	

Section F: Public and Indigenous consultation and engagement

Is the public being engaged? ☒ Yes ☐ No

(If yes, describe the process below and summarize any concerns with the project.)

The public, Indigenous groups and other stakeholders were invited to participate in the regulatory process for the licence amendment application. The CNSC made funding available through its Participant Funding Program (PFP) to Indigenous peoples, members of the public and stakeholders in providing value-added information to the Commission through informed and topic-specific interventions. This funding was offered to review CNL's application and associated documents, as well as CNSC staff's documents (e.g., the Environmental Protection Review Report) and to prepare for and participate in the Commission's public hearing.

Other public participation opportunities, such as webinars, will likely be offered prior to the public hearing to allow for members of the public, Indigenous groups and other stakeholders to gain a better understanding of the process and the project, and have their questions responded to by CNSC staff.

Are Indigenous peoples being engaged /consulted? ☒ Yes ☐ No

(If yes, describe the process below and summarize any concerns with the project.)

The Douglas Point site lies within traditional territory of the following Indigenous groups:

- Chippewas of Nawash Unceded First Nation and Saugeen First Nation who together form Saugeen Ojibway Nation (SON)
- Métis Nation of Ontario (MNO)
- Historic Saugeen Métis (HSM)

The CNSC ensures that all of its licensing decisions under the *Nuclear Safety and Control Act* (NSCA) and the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) uphold the honour of the Crown and consider the broader interests of Indigenous peoples who exercise Indigenous and/or treaty rights in proximity to CNSC-regulated activities or facilities. Although the risks of potential impacts on the environment and Indigenous and/or treaty rights and interests are low, the CNSC has conducted and will continue to engage in consultation activities with the identified Indigenous groups to ensure their full participation in the regulatory process and to ensure their concerns are heard and addressed in a meaningful way.

CNSC staff sent letters of notification in October 2019 and an email update in February 2020 to the Indigenous groups identified above, providing information regarding the proposed licence amendment application, the availability of participant funding to facilitate participation in the regulatory process, and details on how to participate in the Commission's public hearing process. Follow-up phone calls were conducted with the identified groups in February 2020 to ensure they had received the letters and to answer any questions about the licence amendment application.

CNSC staff held introductory discussions about the DPWF site and licence amendment application at in-person meetings with HSM (July 2019), MNO (October 2019), and the SON (November 2019). In March 2020, CNSC staff met with MNO and HSM in Southampton to provide more information on the proposed project and consultation activities, as well as to listen to any specific concerns these groups may have with the proposed decommissioning activities. A meeting with the SON leadership was originally scheduled for March 2020, but is currently being rescheduled in light of the ongoing COVID-19 pandemic.

Throughout the pandemic, CNSC staff have maintained open lines of communication and moved to conducting consultation activities virtually with communities. Updates to Commission hearing dates and corresponding participation timelines were communicated to all groups via email in March, May, and June 2020. The DPWF application has been further discussed via videoconference at monthly meetings with the SON Environment Office (April to August) and at a biannual meeting with HSM in August.

Some of the key themes and concerns raised and responded to by CNSC staff to date (as of August 2020) include:

- the guidelines (federal and/or provincial) that CNL follow to ensure workers' health and safety
- transport of radioactive wastes
- other hazardous waste on site, such as lead and asbestos
- current and future decommissioning plans and facility/land end state
- archaeology
- the need for CNL and CNSC staff to continuously communicate with interested Indigenous groups with regards to current and future activities related to the DPWF site, so that they can keep their citizens and members informed

To date, no specific concerns have been raised with regards to potential impacts on Indigenous and/or treaty rights or interests as a result of the proposed project. However, CNSC staff continue to communicate and engage with all identified Indigenous groups to share information and will work to address any concerns they may have with

regards to the licence amendment application and hearing process. CNSC staff will continue to be flexible and adapt its approach and processes in response to the pandemic and to the needs of each Indigenous group.

All of the identified Indigenous groups have been awarded funding through the CNSC's PFP and plan to participate in the regulatory review process and in the public hearing to advise the Commission directly of any concerns they may have in relation to this licence application. CNSC staff are committed to ongoing consultation and engagement with the identified Indigenous groups regarding CNL's proposed licence amendment and ongoing activities in relation to the DPWF.

CNSC staff will provide additional information with regards to ongoing consultation activities, including any other concerns expressed by Indigenous groups and how they were addressed, to the Commission and the public in CNSC staff's presentation to the Commission or a supplemental Commission Member Document (CMD), where appropriate.

Are other experts/ jurisdictions being consulted? ☒ Yes ☐ No
(If yes, explain which ones and why.)

ECCC was consulted for their federal expertise on species at risk.

Section G: Resources

The following resources were consulted to complete this form.

- Canadian Environmental Assessment Agency, *Guide for Projects on Federal Lands, Making a determination under section 67 of the Canadian Environmental Assessment Act, 2012*, December 2014, https://www.ceaa-acee.gc.ca/Content/6/E/0/6E01A733-ABE2-4375-A466-5E71B967ED7D/CEAA_2012_s67_Determination_Approach_INTERIM-eng.pdf
- CNL, *Douglas Point Waste Facility Detailed Decommissioning Plan Volume 1: Program Overview*, 22-00960-DDP-001, Revision 1, December 2019, [e-doc 6094058](#)
- CNL, *Environmental Effects Review – Environmental Review for Douglas Point Waste Facility - Phase 3 Decommissioning*, 22-03710-ENA-001, Revision 3, August 2020, [e-doc 6362345](#)
- CNL, *Environmental Risk Assessment for Douglas Point*, 22-07000-ASD-001, Revision 0, March 2019, [e-doc 5956321](#)
- CNL, *Plan – Douglas Point Waste Facility Effluent Monitoring Plan*, 22-07220-PLA-001, Revision 0, April 2016, [e-doc 4994826](#)
- CNL, *2019 Annual Compliance Monitoring Report for Douglas Point and Gentilly-1 Waste Facilities*, 22-00521-ACMR-2019, Revision 0, May 2020, [e-doc 6307609](#)
- CNL, *2018 Annual Compliance Monitoring Report for Douglas Point and Gentilly-1 Waste Facilities*, 3640-00521-ACMR-2018, Revision 0, May 2019, [e-doc 5912084](#)
- CNSC, *Environmental Assessment Report: Bruce Power Inc. – Bruce Nuclear Generating Station A and B – PROL 18.00/2020 Licence Renewal*, February 2018, [e-doc 5401045](#)
- CNSC, *Regulatory Document, REGDOC 2.9.1, Environmental Principles, Assessments and Protection Measures*, version 1.1, 2017, <http://nuclearsafety.gc.ca/eng/pdfs/REGDOCS/REGDOC-2-9-1-Environmental-Principles-Assessments-and-Protection-Measures-eng.pdf>
- Government of Canada, *Canadian Environmental Assessment Act, 2012*, <https://laws-lois.justice.gc.ca/eng/acts/c-15.21/20170622/P1TT3xt3.html>

- Government of Canada, Species at Risk Registry, <https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10>, December 2019

Section H: Determination	
Taking into account implementation of mitigation measures outlined in the analysis, this project is <u>not likely to</u> cause significant adverse environmental effects.	<input checked="" type="checkbox"/>
Taking into account implementation of mitigation measures outlined in the analysis, this project is <u>likely to</u> cause significant adverse environmental effects.	<input type="checkbox"/>

Appendix 2: Project-Environment Interactions Matrix

Physical works and activities	Atmospheric environment				Aquatic environment				Geological and hydrogeological environment			Terrestrial environment		Human health					Environmental effects with respect to Indigenous peoples			
	Air quality – radiological	Air quality – non-radiological	Dust	Noise	Surface hydrology	Surface water quality – radiological	Surface water quality – non-radiological	Aquatic biota & habitat	Hydrogeology	Groundwater quality – radiological	Groundwater quality – non-radiological	Soil quality	Terrestrial biota and habitat	Workplace hazards	Worker exposure – radiological	Worker exposure – non-radiological	Public exposure – radiological	Public exposure – non-radiological	Health and socio-economic conditions	Physical and cultural heritage	Current traditional land and resource uses	Archaeological, paleontological or architectural site
Planning envelope A: Non-nuclear structures and buildings																						
Removal of equipment and non-structural components	•	•	•	•										•		•						
Dismantle and/or demolish building structures and removal of underground structures	•	•	•	•		•	•					•		•	•	•						
Backfill and landscape	•	•	•	•																		
Waste packaging, transport and disposal	•	•	•	•										•		•						
Planning envelope B: Nuclear area structures and buildings																						
Decontamination and removal of equipment and non-structural components	•	•	•	•										•	•	•						
Dismantle and/or demolish building structures and removal of underground structures	•	•	•	•		•	•							•	•	•						

Physical works and activities	Atmospheric environment				Aquatic environment				Geological and hydrogeological environment			Terrestrial environment		Human health					Environmental effects with respect to Indigenous peoples			
	Air quality – radiological	Air quality – non-radiological	Dust	Noise	Surface hydrology	Surface water quality – radiological	Surface water quality – non-radiological	Aquatic biota & habitat	Hydrogeology	Groundwater quality – radiological	Groundwater quality – non-radiological	Soil quality	Terrestrial biota and habitat	Workplace hazards	Worker exposure – radiological	Worker exposure – non-radiological	Public exposure – radiological	Public exposure – non-radiological	Health and socio-economic conditions	Physical and cultural heritage	Current traditional land and resource uses	Archaeological, palaeontological or architectural site
Demolish concrete slabs	•	•	•	•		•	•					•										
Backfill and landscape	•	•	•	•										•	•	•						
Waste packaging, transport and disposal	•	•	•	•										•	•	•						
Planning envelope C: Reactor Building clear-out																						
Decontamination and removal of equipment and non-structural components	•	•	•	•										•	•	•						

• = Potential project-environment interaction

Blank box = No potential project-environment interaction

PART TWO

Part Two provides all relevant information pertaining directly to the licence, including:

1. Any proposed changes to the conditions, licensing period, or formatting of an existing licence;
2. The proposed licence;
3. The draft licence conditions handbook; and
4. The current licence.

PROPOSED LICENCE CHANGES

Overview

CNL currently operates the DPWF under the Waste Facility Decommissioning Licence, WFDL-W4-332.02/2034 [9]. The proposed licence incorporates the standard licence conditions and standard format.

Licence Conditions

The proposed licence incorporates the standard licence conditions applicable to DPWF.

Licence Format

The proposed licence uses the standard format.

Licence Period

CNL has not requested any change to the licence period. The current licence expires on December 31, 2034. Unless the licence period is revised the licence would remain in effect for approximately 15 years. The current licence solely authorizes activities associated with continued storage with surveillance.

CNSC staff recommendations regarding licence periods reflect the level of risk, licensee performance history, and facility planning cycles. Licence periods should be commensurate with the licensed activity, the hazards associated with the activity, and the predicted impacts of the activity.

CNSC staff noted the following in making their recommendation:

- The hazards associated with the proposed licensed activities are well characterized and documented in the EER, ERA, and Program Overview DDP.
- CNL has had a satisfactory performance history at the DPWF during the current licence period.
- The current licence request is to perform activities associated with PEs A, B, and C of phase 3 decommissioning. Table 10-1 of the Program Overview DDP provided by CNL in support of its application indicates that these activities will be completed by the end of 2030.
- Decommissioning of nuclear buildings and structures represents an increase in risk compared to the SWS activities currently being performed at the DPWF. While the overall risk of the site remains low, this change merits considering a shorter licence period.

Given the considerations above, CNSC staff recommend that the licence period be aligned with the proposed activities by revising the expiration date of the licence to December 31, 2030. CNSC staff propose that this reduced licence term is more appropriate for a facility undergoing active decommissioning.

PROPOSED LICENCE

The proposed Licence is provided on the following pages of the document.

e-Doc 5961711(WORD)

e-Doc 6255130 (PDF)



WASTE FACILITY DECOMMISSIONING LICENCE

DOUGLAS POINT WASTE FACILITY

- I) **LICENCE NUMBER:** **WFDL-W4-322.03/2030**
- II) **LICENSEE:** Pursuant to section 24 of the *Nuclear Safety and Control Act*, this licence is issued to
- Canadian Nuclear Laboratories Ltd.**
Laboratoires Nucléaires Canadiens Ltée
286 Plant Road
Chalk River, Ontario
K0J 1J0
- III) **LICENCE PERIOD:** This licence is valid from the date signed and remains in effect until December 31, 2030 unless otherwise suspended, amended, revoked or replaced.
- IV) **LICENSED ACTIVITIES:**
- This licence authorizes the licensee to:
- a) decommission the Douglas Point Waste Facility (hereinafter “DPWF”) located in Tiverton, Province of Ontario,
 - b) produce, possess, process, transfer, use, package, manage, and store the nuclear substances that are required for, associated with or arise from the activities described in a),
 - c) possess, use, produce and transfer prescribed equipment that is required for, associated with, or arises from the activities described in a),
 - d) possess, use and transfer prescribed information that is required for, associated with, or arises from the activities described in a).

V) EXPLANATORY NOTES:

- (i) Nothing in this licence shall be construed to authorize non-compliance with any other applicable legal obligation or restriction.
- (ii) Unless otherwise provided for in this licence, words and expressions used in this licence have the same meaning as in the *Nuclear Safety and Control Act* and associated Regulations.
- (iii) The Douglas Point Waste Facility Licence Conditions Handbook (LCH) provides compliance verification criteria used to verify compliance with the conditions set out in this licence, including information regarding delegation of authority and applicable versions of documents and a process for version control of codes, standards or other documents that are used as compliance verification criteria.

VI) CONDITIONS:

G GENERAL

- G.1 The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:
- (i) the regulatory requirements set out in the applicable laws and regulations;
 - (ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence; and
 - (iii) the safety and control measures described in the licence application and the documents needed to support that licence application;
- unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").
- G.2 The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.
- G.3 The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.
- G.4 The licensee shall implement and maintain a public information and disclosure program.

1 MANAGEMENT SYSTEM

- 1.1 The licensee shall implement and maintain a management system.

2 HUMAN PERFORMANCE MANAGEMENT

- 2.1 The licensee shall implement and maintain a human performance program.
- 2.2 The licensee shall implement and maintain a training program.

3 OPERATING PERFORMANCE

- 3.1 The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

4 SAFETY ANALYSIS

- 4.1 The licensee shall implement and maintain a safety analysis program.

5 PHYSICAL DESIGN

- 5.1 The licensee shall implement and maintain a design program.

6 FITNESS FOR SERVICE

- 6.1 The licensee shall implement and maintain a fitness for service program.

7 RADIATION PROTECTION

- 7.1 The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

8 CONVENTIONAL HEALTH AND SAFETY

- 8.1 The licensee shall implement and maintain a conventional health and safety program.

9 ENVIRONMENTAL PROTECTION

- 9.1 The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

10 EMERGENCY MANAGEMENT AND FIRE PROTECTION

- 10.1 The licensee shall implement and maintain an emergency preparedness program.
- 10.2 The licensee shall implement and maintain a fire protection program.

11 WASTE MANAGEMENT

- 11.1 The licensee shall implement and maintain a waste management program.
- 11.2 The licensee shall implement and maintain a decommissioning plan.

12 SECURITY

- 12.1 The licensee shall implement and maintain a security program.

13 SAFEGUARDS AND NON-PROLIFERATION

- 13.1 The licensee shall implement and maintain a safeguards program.

14 PACKAGING AND TRANSPORT

- 14.1 The licensee shall implement and maintain a packaging and transport program.

SIGNED at OTTAWA, _____.

Rumina Velshi, President
on behalf of the Canadian Nuclear Safety Commission

DRAFT LICENCE CONDITIONS HANDBOOK

The draft Licence Conditions Handbook is provided on the following pages of the document.

e-Doc 5962126 (WORD)

e-Doc 6282053 (PDF)



e-Doc 6282053 (PDF)
e-Doc 5962126 (Word)

LICENCE CONDITIONS HANDBOOK WFDL-LCH-W4-332.03/2030

PROTOTYPE WASTE FACILITIES – WASTE FACILITY DECOMMISSIONING LICENCE

DOUGLAS POINT WASTE FACILITY

WFDL-W4-332.03/2030

Revision 1



DRAFT

**Licence Conditions Handbook
(WFDL-LCH-W4-332.03/2030,
Revision 1)**

Effective: December 2020

**Prototype Waste Facilities – Waste Facility
Decommissioning Licence
Douglas Point Waste Facility
WFDL-W4-332.03/2030 (Effective: December 2020)**

SIGNED at OTTAWA this _____ day of _____, 2020

Candida Cianci, Director

**Canadian Nuclear Laboratories Regulatory Program Division
Directorate of Nuclear Cycle and Facilities Regulations
Canadian Nuclear Safety Commission**

REVISION HISTORY:

Effective Date	Rev. #	e-Doc #	Description	CAF e-Doc #
July 25, 2014	0	4463228	Original Document	N/A
June 14, 2019	1	5734992	Split prototype reactor waste facilities LCH into three separate LCHs. Update format and contents of LCH.	5894235
December XX, 2020	2	5962126	Licence Amendment to proceed with active decommissioning	

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INTRODUCTION

The general purpose of the Licence Conditions Handbook (LCH) is to identify and clarify the relevant parts of the licensing basis for each licence condition. This will help ensure that the licensee performs the licensed activities at the Douglas Point Waste Facility (DPWF) in accordance with the licensing basis for the DPWF and the intent of the DPWF licence. The LCH should be read in conjunction with the licence.

The LCH typically has three parts under each licence condition: the Preamble, Compliance Verification Criteria (CVC), and Guidance. The Preamble explains, as needed, the regulatory context, background, and/or history related to the licence condition. CVC are criteria used by Canadian Nuclear Safety Commission (CNSC) staff to verify and oversee compliance with the licence condition. Guidance is non-mandatory information, including direction, on how to comply with the licence condition.

The documents referenced in the LCH by e-Access numbers are not publicly available. The links provided in the LCH are references to the internal CNSC electronic filing system, and those documents cannot be opened from outside of the CNSC network.

Current versions of the licensing basis publications, licensee documents that require notification of change, and guidance documents referenced in the LCH are tracked in the document *Licensing Documents for DPWF* (e-Doc [5794953](#)) and *CNL Company-Wide* (e-Doc [5507946](#)), which are controlled by the Canadian Nuclear Laboratories Regulatory Program Division and are available to the licensee upon request.

Most CNSC documents referenced in the LCH are available through the CNSC public website. Documents listed on the CNSC website may contain prescribed information as defined by the *General Nuclear Safety and Control Regulations*. Information in these documents will be made available only to stakeholders with appropriate security clearance on a valid need to know basis.

The licensee documents referenced in the LCH are not publicly available; they contain proprietary information or prescribed information as defined by the *General Nuclear Safety and Control Regulations*.

Domestic and international standards (in particular consensus standards produced by the CSA Group) are an important component of the CNSC's regulatory framework. Standards support the regulatory requirements established through the *Nuclear Safety and Control Act* (NSCA), its regulations and licences by setting out the necessary elements for acceptable design and performance at a regulated facility or a regulated activity. Standards are one of the tools used by the CNSC to evaluate whether licensees are qualified to carry out licensed activities.

The CNSC offers complimentary access to the CSA Group [suite of nuclear standards](#) through the CNSC website. This access platform allows interested stakeholders to view these standards online through any device that can access the Internet. Standards applicable to the licensees are documented in the CVC or guidance as appropriate.

Appendix A to the LCH provides definitions of terms and a list of acronyms used throughout it.

More information on the LCH is available in the CNSC document titled *How to Write a Licence Conditions Handbook* (LCH) (e-Doc [4967591](#)).

G. GENERAL

Licence Condition G.1: Licensing Basis

The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

- (i) the regulatory requirements set out in the applicable laws and regulations;
- (ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence; and
- (iii) the safety and control measures described in the licence application and the documents needed to support that licence application;

unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").

Preamble:

The licensing basis sets the boundary conditions for acceptable performance at a regulated facility or activity, and thus establishes the basis for the CNSC's compliance program in respect of that regulated facility or activity. The degree to which the regulatory requirements are applied to DPWF facilities and activities should reflect their importance to health and safety of persons, environment, national security, international obligations to which Canada has agreed, licensee's quality and economic expectations, the complexity of facility or activity, and the possible consequences if accidents occur or the activity is carried out incorrectly.

Where the licence condition requires the licensee to implement and maintain a particular program, the licensee documents that describe and implement the program are part of the licensing basis. Programs required by licence conditions or referred to in the LCH may or may not be health, safety, security, environment, and quality programs as defined in the Canadian Nuclear Laboratories Ltd. (CNL)'s management system.

Regulatory document *REGDOC-3.5.3, Regulatory Fundamentals*, outlines the CNSC's regulatory philosophy and approach to applying the NSCA. It provides information about the licensing basis which sets the boundary conditions for a regulated activity, and establishes the basis for the CNSC's compliance program for that regulated activity.

The DPWF is located at the Bruce Power Site, which is midway between Kincardine and Port Elgin, Ontario, on the eastern shore of Lake Huron. It comprises parts of Lots 15 and 16 in Lake Range, in the Township of Bruce in the County of Bruce. This area is primarily rural and there is no single major urban centre in this region. Access can only be obtained by entering the Bruce Power Site through Bruce Power Security Main Gatehouse. The location within the Bruce Power Site is shown in Figure 2-2 of the Safety Analysis Report for the Douglas Point Waste Facility; 22-03610-SAR-001.

Compliance Verification Criteria:

Regulatory Role of the Licensing Basis

The licensing basis is established when the Commission renders its decision regarding the licence application.

Licence condition G.1 requires the licensee to conduct the licensed activities in accordance with the licensing basis. For activities that are found to be not in accordance with the licensing basis, the licensee shall take action as soon as practicable to return to a state consistent with the licensing basis, taking into account the risk significance of the situation.

CNSC Staff's Approach to Assessing the Licensing Basis

The licence condition G.1 is not intended to unduly inhibit the ongoing management and operation of the facility or the licensee's ability to adapt to changing circumstances and continuously improve, in accordance with its management system. Where the licensing basis refers to specific configurations, methods, solutions, designs, etc., the licensee is free to propose alternate approaches as long as they remain, overall, in accordance with the licensing basis and have a neutral or positive impact on health, safety, the environment, security, and safeguards. However, the licensee shall assess changes to confirm that operations remain in accordance with the licensing basis. The assessment shall be documented and made available to CNSC staff upon request.

For any proposed activity to be carried out on the DPWF, CNSC staff will review the information submitted by CNL to independently determine if the proposed activity remains within the licensing basis. CNSC staff assess a proposed activity as being within the licensing basis based on the hazard and risk of the change, and its impact on the overall safety of DPWF.

CNSC staff will submit to the Commission for consideration any proposed activity which CNSC staff consider to be outside the licensing basis. If the Commission grants approval to such an activity, it will become part of the licensing basis for DPWF and reflected in updates to LCH as appropriate.

Documentation

Applicable licensee documents are listed in the LCH under the heading "Licensee Documents that Require Notification of Change". Applicable CNSC regulatory documents, Compliance Verification Criteria (CSA) standards and other documents are listed in the LCH under the heading "Licensing Basis Publications". The licensee documents listed in the LCH could cite other documents that also contain safety and control measures (i.e., there may be safety and control measures in "nested" references in the application). The licensee documents listed in the LCH and their "nested" references define the licensing basis for the programs required by the DPWF licence as long as they include safety and control measures.

Activities Included in the Licensing Basis

Conduct of licensed activities at the DPWF include:

- a) decommission the Douglas Point Waste Facility (hereinafter "DPWF") located in Tiverton, Province of Ontario,
- b) produce, possess, process, transfer, use, package, manage, and store the nuclear substances that are required for, associated with or arise from the activities described in a),

- c) possess, use, produce and transfer prescribed equipment that is required for, associated with, or arises from the activities described in a),
- d) possess, use and transfer prescribed information that is required for, associated with, or arises from the activities described in a).

Licence Application Documents and Supporting Documents

Document Number	Document Title	e-Doc
22-CNNO-19-0008-L	Application for Licence Amendment to Proceed with Phase 3 Decommissioning at Douglas Point Waste Facility	5956292
140-CNNO-18-0003-L	CNL request to separate the Waste Facility Decommissioning Licence for Prototype Waste Facilities, WFDL-W4-332.01/2034 into three separate licences for the Douglas Point (DP), Gentilly-1 (G-1) and Nuclear Power Demonstration (NPD) Waste Facilities	5618549
3640-ACNO-14-0004-L	Application to Replace Waste Facility Operating Licences for Atomic Energy of Canada Limited (AECL) Prototype Reactor Waste Management Facilities: NPD, DP and G-1	5794953
145-ACNO-14-0021-L	AECL Transfer of Commission Licences to the Canadian Nuclear Laboratories Limited and Associated Applications for Exemption from Regulations	5794953

Guidance:

When the licensee becomes aware that a proposed change or activity might be outside the licensing basis, it should first seek direction from CNSC staff regarding the potential acceptability of this change or activity. The licensee should take into account that certain types of proposed changes might require significant lead times before CNSC staff can make recommendations and/or the Commission can properly consider them.

Guidance Documents

Document Number	Document Title	Version
REGDOC-3.5.3	Regulatory Fundamentals	2018

Licence Condition G.2: Notification of Changes

The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

Preamble:

Most changes to DPWF and its facilities are captured as changes to corresponding licensee's documents. The LCH identifies licensee documents that require written notification of changes to the CNSC.

Compliance Verification Criteria:

The licensee shall, as a minimum, notify CNSC staff of changes to licensee's documents identified in the LCH. The written notification of change shall include a copy of the revised document and a description of the change.

CNL program requirements documents (PRDs) and program description documents (PDDs) are accompanied by governing document indices (GDIs). The licensee shall provide updated versions of PDDs quarterly and GDIs annually or upon request from CNSC.

Licensee documents listed in the LCH are subdivided into groups having different requirements for notification of change: documents that require prior written notification of changes and those that require written notification only. If the licensee document, or some part of it, also requires CNSC acceptance of change, a footnote has been added to the table. Such a requirement may be established in the document itself, in another licence condition (LC), or in a licensing basis publication.

Prior Notification Requirement	Definition
Requires prior notification	<p>The licensee shall submit the revised document to the CNSC as far in advance of planned implementation as practicable, but not less than 30 days prior to planned implementation. The licensee shall allow sufficient time for the CNSC to review the change proportionate to its complexity and the importance of the safety and control measures being affected. This is denoted by a Y in the column "prior notification".</p> <p>Where a document or some part of it requires acceptance by CNSC staff prior to implementation, a footnote has been added to the notification column.</p>
Requires notification at time of implementation	<p>The licensee shall notify the CNSC at the time of implementing a revised document. This is denoted by a N in the column "prior notification".</p>

Changes that may affect the licensing basis, including any change that is not captured as a change to a document listed in the LCH (e.g., construction of new facilities/buildings, transitioning any facility/building from one phase of its life cycle to another, or infrastructure improvements at DPWF), requires written prior notification to the CNSC to verify they are in accordance with the licensing basis.

Guidance:

For proposed changes that would not be in accordance with the licensing basis, the guidance for licence condition G.1 applies.

Licence Condition G.3: Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

Preamble:

The *General Nuclear Safety and Control Regulations* requires that a licence application contains “a description of any proposed financial guarantee relating to the activity to be licensed”.

The financial guarantee for DPWF is in the form of an expressed commitment from AECL which is a Schedule III, Part 1 Crown Corporation under the *Financial Administration Act* and an agent of Her Majesty in Right of Canada. As an agent of Her Majesty in Right of Canada, AECL’s liabilities are ultimately liabilities of Her Majesty in Right of Canada. While the restructuring of AECL has seen the ownership of Canadian Nuclear Laboratories Ltd. (CNL) transferred to a private-sector contractor, the Canadian National Energy Alliance (CNEA), AECL retains ownership of the lands, assets and liabilities associated with CNL’s licences. These liabilities have been officially recognized by the Minister of Natural Resources in a letter dated July 31, 2015 (e-Doc [4803454](#), [4815508](#)).

Compliance Verification Criteria:

None provided.

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
145-NRCANNO-15-0.001	Relating to Provision of Financial Guarantees for AECL Sites	5794303	N/A
145-CNNO-20-0028-L	Submission of Information Regarding Financial Guarantees for all Atomic Energy of Canada Limited Sites Operated by Canadian Nuclear Laboratories	6373440	N/A

Guidance:

Guidance Documents

Document Number	Document Title	Version
G-206	Financial Guarantee for the Decommissioning of Licensed Activities	2000

Licence Condition G.4: Public Information and Disclosure Program

The licensee shall implement and maintain a public information and disclosure program.

Preamble:

Class I Nuclear Facilities Regulations require that an application for a licence shall contain the proposed program to inform persons living in the vicinity of the site of the general nature and characteristics of the anticipated effects on the environment and the health and safety of persons that may result from the activity to be licensed.

The primary goal of the public information program, as it relates to the licensed activities, is to ensure that information related to the health, safety and security of persons and the environment, and other issues associated with the lifecycle of nuclear facilities are effectively communicated to the public. The public information program includes a public disclosure protocol describing the information and the medium of disclosure in regard to information and reports of interest to the public.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
RD/GD-99.3	Public Information and Disclosure	2012	July 25, 2014

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
CW-513430-REPT-001	Public Information Program for Canadian Nuclear Laboratories (CNL)	5507946	N

Guidance:

None provided.

1. SCA - MANAGEMENT SYSTEM

Licence Condition 1.1: Management System

The licensee shall implement and maintain a management system.

Preamble:

Safe and reliable operation of nuclear facilities requires a commitment and adherence to a set of management system principles and, consistent with those principles, the implementation of planned and systematic processes that achieve expected results. The management system focuses on safety in all business activities and supports the safe conduct of licensed activities at CNL.

The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain the proposed management system for the activity to be licensed, including measures to promote and support safety culture.

The *General Nuclear Safety and Control Regulations* require that a licence application contain the applicant's organizational management structure, including the internal allocation of functions, responsibilities and authority.

The management system is in place to satisfy the requirements set out in the NSCA, regulations made pursuant to the NSCA, the licence and the measures necessary to ensure that safety is of paramount consideration in the implementation of the management system. The management system promotes and supports a healthy safety culture by integrating the characteristics of a healthy safety culture:

- Safety is a clearly recognized value;
- Accountability for safety is clear;
- Safety is integrated into all activities;
- A safety leadership process exists; and
- Safety culture is learning driven.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N286-12	Management system requirements for nuclear facilities	2012 (R2017)	February 8, 2019
REGDOC-2.1.2	Safety Culture	2018	May 31, 2019

MANAGEMENT SYSTEM

Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-514100-MAN-001	CNL Management System Manual	5507946	Y
900-514200-PDD-001	Quality	5507946	N
900-514300-LST-001	Site Licences, Certificates, Permits, Building / Facility Contacts & Licence Representatives	5507946	N
900-514100-LST-002	Codes, Regulations, Standards, and other Documents	5507946	N

Guidance:

The licensee should conduct self-assessments of safety culture periodically. The assessment method should be documented and the framework should include links to the safety culture characteristics: safety is a clearly recognized value, leadership is clear, accountability is clear, safety is integrated into all activities, safety is learning-driven and the work environment is safety conscious.

Guidance Documents

Document Number	Document Title	Version
CSA N286.0.1	Commentary on N286-12, Management system requirements for nuclear facilities	2014

MANAGEMENT SYSTEM

2. SCA – HUMAN PERFORMANCE MANAGEMENT

Licence Condition 2.1: Human Performance Program

The licensee shall implement and maintain a human performance program.

Preamble:

Human performance is the outcome of human behaviours, functions and actions in a specified environment, reflecting the ability of workers and management to meet the system's defined performance under the conditions in which the system will be employed.

Human factors are factors that influence human performance as it relates to the safety of a nuclear facility or activity over all the phases, including design, operation, maintenance, and decommissioning. These factors may include the characteristics of the person, task, equipment, organization, environment, and training. The application of human factors to issues such as interface design, training, procedures, organization and job design may affect the reliability of humans performing tasks under various conditions.

The human performance program addresses and integrates the range of human factors that influence human performance, including but not limited to:

- The provision of qualified workers;
- The reduction of human error;
- Organizational support for safe work activities;
- The continuous improvement of human performance; and
- Monitoring hours of work.

The *General Nuclear Safety and Control Regulations* require the licensee to: ensure the presence of sufficient number of qualified staff; train the workers; and ensure the workers follow procedures and safe work practices.

The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain the proposed human performance program for the activity to be licensed, including measures that ensure workers fitness for duty.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.2.4	Fitness for Duty: Managing Worker Fatigue	2017	December 31, 2019
REGDOC-2.2.4	Fitness for Duty, Volume II: Managing Alcohol and Drug Use, version 2	2017	TBD

HUMAN PERFORMANCE MANAGEMENT

REGDOC 2.2.4	Fitness for Duty, Volume III: Nuclear Security Officer Medical, Physical, and Psychological Fitness	2017	TBD
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Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-514000-PDD-001	Performance Assurance	5507946	N
900-514000-PRD-001	Performance Assurance	5507946	Y

Guidance:

The licensee should continuously monitor human performance, take steps to identify human performance weaknesses, improve human performance and reduce the likelihood of nuclear safety events with human performance-related causes and root causes.

Guidance Documents

Document Number	Document Title	Version
REGDOC-2.2.5	Minimum Staff Complement	2019

Licence Condition 2.2: Training Program

The licensee shall implement and maintain a training program.

Preamble:

This licence condition requires the licensee to develop and implement training programs for workers.

It also provides the requirements regarding the program and processes necessary to support responsibilities of, qualifications and requalification training of persons at the nuclear facility.

As defined by the *General Nuclear Safety and Control Regulations*, a worker is a person who performs work that is referred to in a licence. This includes contractors and temporary employees. Training requirements apply equally to these types of workers as to the licensee's own employees.

The *General Nuclear Safety and Control Regulations* require that licensees ensure that there are a sufficient number of properly trained and qualified workers to safely conduct the licensed activities.

The *Class I Nuclear Facilities Regulations* require that applicants for a Class I facility licence describe the training programs which have been implemented, and that licence applications include the proposed responsibilities, qualification requirements, training program and requalification program for workers; along with the results that have been achieved in implementing the program for recruiting, training and qualifying workers.

HUMAN PERFORMANCE MANAGEMENT

Compliance Verification Criteria:

The licensee shall ensure that all workers are qualified to perform the duties and tasks required of their position.

All training programs related to workers in positions where the consequence of human error poses a risk to the environment, the health and safety of persons, or to the security of the nuclear facilities and licensed activities, are evaluated against the criteria for a systematic approach to training (SAT).

Although contractors may perform certain licensed activities in these circumstances, the licensee retains the responsibility that the facility remains compliant with the licence. As such, the licensee is accountable to the CNSC to provide the required assurances that the health, safety, and security of the public and workers, and the environment are protected. This accountability to the CNSC cannot be delegated through contractual arrangements.

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.2.2	Personnel Training, version 2	2016	June 1, 2020

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Notification
900-510200-PDD-001	Training and Development	5507946	N
900-510200-PRD-001	Training and Development	5507946	Y

Guidance:

None provided.

3. SCA – OPERATING PERFORMANCE

Licence Condition 3.1: Reporting Requirements

The licensee shall implement and maintain a process for reporting to the Commission or a person authorized by the Commission that includes reporting of all events required by the *Nuclear Safety and Control Act* and its Regulations.

Preamble:

This requirement provides information to the CNSC on the results of its operations, its decommissioning activities, the results of the monitoring programs, any changes made to procedures, equipment, or structures, and a summary of any reports made pursuant to sections 29 and 30 of the *General Nuclear Safety and Control Regulations*.

Compliance Verification Criteria:

The licensee shall submit an annual report to CNSC staff within 60 days of the end of the fiscal year.

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-3.1.2	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	2018	January 1, 2019

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-514300-MCP-006	CNL Reporting to Regulatory Agencies	5507946	N

Guidance:

None provided.

OPERATING PERFORMANCE

4. SCA – SAFETY ANALYSIS

Licence Condition 4.1: Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

Preamble:

All event sequences which can occur in a nuclear facility must be analyzed to ensure safe operation. A deterministic safety analysis evaluates the facility's responses to such events by using predetermined rules and assumptions. The objectives of the deterministic safety analysis are stated in CSA N292.0. See LCH Section 11.1 for version control of CSA N292.0.

The *General Nuclear Safety and Control Regulations* require that a licence application contain a description and the results of any analyses performed.

The *Class I Nuclear Facilities Regulations* require, amongst other requirements, that an application for a licence to operate a Class I nuclear facility contains a final safety analysis report, and additional supporting information.

The licensee holds the responsibility for ensuring that the safety analysis is accurate and meets the regulatory requirements, and shall maintain adequate capability to perform or procure safety analysis and to train safety analysts.

Compliance Verification Criteria:

Every 5 years, the licensee shall review and revise, if necessary, the safety analysis report for the facility to confirm that the document accurately captures the condition of the facility and that the radiological consequences of accident scenarios do not exceed public dose limits. The safety analysis report review shall be submitted to CNSC staff.

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
22-03610-SAR-001	Safety Analysis Report for the Douglas Point Waste Management Facility	5794953	Y
900-508770-PDD-001	Safety Analysis	5507946	N
900-508770-PRD-001	Safety Analysis	5507946	Y

Guidance:

Guidance Documents

Document Number	Document Title	Version
IAEA SSR-4	Safety of Nuclear Fuel Cycle Facilities	2017
IAEA GSR Part 4, Rev. 1	Safety Assessment for Facilities and Activities	2016

SAFETY ANALYSIS

5. SCA – PHYSICAL DESIGN

Licence Condition 5.1: Design Program

The licensee shall implement and maintain a design program.

Preamble:

The *Class I Nuclear Facilities Regulations* require that a licence application contain a description of the structures, systems and components (SSCs), and relevant documentation of the facility design.

A design program ensures that the facility design is managed using a well-defined systematic approach.

Implementing and maintaining a design program confirms that safety-related SSCs and any modifications to them continue to meet their design basis given new information arising over time and taking changes in the external environment into account. It also confirms that SSCs continue to be able to perform their safety functions under all facility states. An important cross-cutting element of a design program is design basis management.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
	<i>National Building Code of Canada</i> ¹	2015	February 8, 2019

¹ Changes to the facility structure shall be in compliance with NBCC

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-508120-PDD-001	Design Authority and Design Engineering	5507946	N
900-508120-PRD-001	Design Authority and Design Engineering	5507946	Y
22-01603-722-005	Description of the Static State Douglas Point Waste Management Facility	5794953	N

PHYSICAL DESIGN

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC 2.5.1	General Design Considerations: Human Factors	2019

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PHYSICAL DESIGN

6. SCA – FITNESS FOR SERVICE

Licence Condition 6.1: Fitness for Service Program

The licensee shall implement and maintain a fitness for service program.

Preamble:

The *Class I Nuclear Facilities Regulations* requires that a licence application contain the proposed measures, policies, methods and procedures to maintain the nuclear facility.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version
REGDOC-2.6.3	Aging Management	2014

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
22-20000-680-001	Life Management Program for Douglas Point Structures	5794953	Y
22-00960-SWS-002	Douglas Point Waste Facility Storage with Surveillance Activities and Schedules	5794953	Y
900-508230-PDD-001	Maintenance and Work Management	5507946	N
900-508230-PRD-001	Maintenance and Work Management	5507946	Y

Guidance:

None provided.

7. SCA – RADIATION PROTECTION

Licence Condition 7.1: Radiation Protection Program

The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

Preamble:

The *Radiation Protection Regulations* (RPR) require that the licensee implement a radiation protection program and also ascertain and record doses for each person who performs any duties in connection with any activity that is authorized by the NSCA or is present at a place where that activity is carried out. This program must ensure that doses to persons do not exceed prescribed dose limits and are kept as low as reasonably achievable (ALARA), social and economic factors being taken into account. Also, the program must ensure that occupational exposures are ascertained and recorded in accordance with the RPR through the establishment of dosimetry requirements. The regulatory dose limits to workers and the public are explicitly provided in the RPR. The RPR also specifies the requirements related to action levels (ALs) and indicate that the licence will be used to identify their notification timeframes. ALs relate to the parameters of dose to workers.

ALs are designed to alert licensees before regulatory dose limits are reached. By definition, if an AL is reached, a loss of control of some part of the associated radiation protection program may have occurred, and specific action is required, as defined in the RPR and the licence. ALs are not intended to be static and are to reflect operating conditions at the DPWF site.

Compliance Verification Criteria:

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-508740-PDD-001	Radiation Protection Program	5507946	N
900-508740-PRD-001	Radiation Protection Program	5507946	Y
900-508740-MCP-006	Action Levels for Internal and External Exposure	5507946	Y
900-508740-MCP-007	Dose Control Points	5507946	N
900-508740-MCP-026	ALARA Review and Assessment – Planning and Control of Radiation Work	5507946	N
900-508740-STD-005	Design and Modification Considerations	5507946	N
900-508740-STD-012	Contamination Limits	5507946	N

RADIATION PROTECTION

Guidance:

The licensee should conduct a documented review and, if necessary, revise the ALs at least once every five years in order to validate their effectiveness. The results of such reviews should be provided to CNSC staff.

Guidance Documents

Document Number	Document Title	Version
G-129, Rev. 1	Keeping Radiation Exposures and Doses “As Low as Reasonably Achievable (ALARA)”	2004
G-228	Developing and Using Action Levels	2001

8. SCA – CONVENTIONAL HEALTH AND SAFETY

Licence Condition 8.1: Conventional Health and Safety Program

The licensee shall implement and maintain a conventional health and safety program.

Preamble:

The *Class I Nuclear Facilities Regulations* requires that a licence application contain the proposed worker health and safety policies and procedures.

Federally regulated sites are also subject to the requirements of *Canada Labour Code* and *Canada Occupational Health and Safety Regulations*.

Compliance Verification Criteria:

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-510400-PDD-001	Occupational Safety and Health	5507946	N
900-510400-PRD-001	Occupational Safety and Health	5507946	Y

Guidance:

None provided.

9. SCA – ENVIRONMENTAL PROTECTION

Licence Condition 9.1: Environmental Protection Program

The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

Preamble:

The *Class I Nuclear Facilities Regulations* requires that a licence application contain information related to environmental protection. The *General Nuclear Safety and Control Regulations* (GNSCR) requires every licensee to take all reasonable precautions to protect the environment. The *Radiation Protection Regulations* prescribe the radiation dose limits for the general public of 1 mSv per calendar year.

The *Radiation Protection Regulations* specify requirements related to “Action Levels” and indicate that the licence will be used to identify the action levels and the notification timeframes.

The release of hazardous substances is regulated by Environment Canada and Climate Change through various acts and regulations, as well as by the CNSC.

The environmental protection Safety and Control Area (SCA) includes the following:

- Effluent and emissions control (releases);
- Environmental management system;
- Assessment and monitoring;
- Protection of the public; and
- Environmental Risk Assessment

Compliance Verification Criteria:

Licensing Basis Publications

The licensee shall implement and maintain programs to ensure environmental protection as set out in licensing basis (LCH Section G.1).

The CSA N286-12 defines other specific requirements needed to adequately address environmental protection. See LCH Section 1.1 for version control of CSA N286.

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
Effluent and Emissions Control (Releases)			
CSA N288.5	Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills	2011 (R2016)	2016
CSA N288.8	Establishing and implementing action levels to control releases to the environment from nuclear facilities	2017	April 1, 2020
Environmental Management System			
REGDOC-2.9.1	REGDOC-2.9.1, Environmental Protection: Environmental Protection Policies, Programs and Procedures (2013)	2013	2017
REGDOC-2.9.1	Environmental Protection: Environmental Principles, Assessments and Protection Measures, version 1.1	2017	December, 2021
Assessment and Monitoring			
CSA N288.4	Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills ¹	2010 (R2015)	April 1, 2019
CSA N288.7	Groundwater protection programs at Class I nuclear facilities and uranium mines and mills	2015	December, 2021
Environmental Risk Assessment			
CSA N288.6	Environmental risk assessment at Class I nuclear facilities and uranium mines and mills	2012 (R2017)	April 1, 2019

¹CNL's Environmental Monitoring at DPWF is limited to only effluent monitoring.

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
22-03480-NSN-002	Derived Release Limits for CNL's Douglas Point Waste Facility	5794953	Y ¹
22-07220-PLA-001	DPWF Effluent Monitoring Plan	5794953	Y ¹
900-509200-PDD-001	Environmental Protection Program	5507946	N
900-509200-PRD-001	Environmental Protection Program	5507946	Y
22-07000-ASD-001	Environmental Risk Assessment for Douglas Point	5794953	Y
22-03710-ENA-001	Environmental Review for Douglas Point Waste Facility - Phase 3 Decommissioning	5794953	Y

¹ Requires CNSC acceptance

Guidance:

Guidance Documents

Document Number	Document Title	Version
G-228	Developing and Using Action Levels	2001
CSA N288.1	Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities	2014
G-129	Keeping Radiation Exposures and Doses "As Low As Reasonably Achievable (ALARA)"	2004

ENVIRONMENTAL PROTECTION

10. SCA – EMERGENCY MANAGEMENT AND FIRE PROTECTION

Licence Condition 10.1: Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness and response program.

Preamble:

The *Class I Nuclear Facilities Regulations* requires measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous substances on the environment, the health and safety of persons and the maintenance of national security, including measures to assist, notify, report to offsite authorities including the testing of the implementation of these measures.

This licence condition requires the licensee to establish an emergency preparedness program to prepare for, to respond to, and to recover from the effects of accidental radiological/nuclear and/or hazardous substance release. As part of the emergency preparedness program, the licensee establishes an onsite emergency response plan and an emergency response organization and makes arrangements for coordinating offsite activities and cooperating with external response organizations throughout all phases of an emergency.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.10.1	Nuclear Emergency Preparedness and Response, Version 2	2016	July 1, 2020

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
22-08620-021-000-0001	Douglas Point Emergency Response Service Agreement	5794953	Y
900-508730-PRD-001	Emergency Preparedness	5507946	Y
900-508730-PDD-001	Emergency Preparedness	5507946	N

Guidance:

None provided.

EMERGENCY MANAGEMENT AND FIRE PROTECTION

Licence Condition 10.2: Fire Protection Program

The licensee shall implement and maintain a fire protection program.

Preamble:

Licensees require a comprehensive fire protection program (the set of planned, coordinated, controlled and documented activities) to ensure the licensed activities do not result in unreasonable risk to the health and safety of persons and to the environment due to fire and to ensure that the licensee is able to efficiently and effectively respond to emergency fire situations.

Fire protection provisions, including response, are required for the design, construction, commissioning, operation, and decommissioning of nuclear facilities, including structures, systems, and components (SSCs) that directly support the plant and the protected area.

The *National Fire Code of Canada* sets out technical provisions regulating (a) activities related to the construction, use or demolition of buildings and facilities; (b) the condition of specific elements of buildings and facilities; (c) the design or construction of specific elements of facilities related to certain hazards; and (d) protection measures for the current or intended use of buildings.

Compliance Verification Criteria:

The licensee shall, prior to implementation of any proposed modifications of the facility with the potential to negatively impact protection from fire, determine the need for a third party review based on a risk based approach using the fire protection screening process.

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N393	Fire protection for facilities that process, handle, or store nuclear substances	2013 (R2016)	July 25, 2014
	<i>National Fire Code of Canada</i>	2015	February 8, 2019

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
22-08951-FHA-002	Douglas Point Waste Management Facility Fire Hazard Assessment	5794953	Y
900-508720-PDD-001	Fire Protection	5507946	N
900-508720-PRD-001	Fire Protection	5507946	Y

EMERGENCY MANAGEMENT AND FIRE PROTECTION

Guidance:

Where CSA N393 does not address a fire protection topic or issue in whole, or where additional guidance is beneficial, the standards and recommended practices set out by the National Fire Protection Act (NFPA) are used as guidance by CNSC staff in determining the adequacy of a fire protection measure.

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11. SCA – WASTE MANAGEMENT

Licence Condition 11.1: Waste Management Program

The licensee shall implement and maintain a waste management program.

Preamble:

The “waste management” safety and control area covers internal waste-related programs that form part of the facility’s operations up to the point where the waste is removed from the facility to a separate waste management facility. Topics include waste management, waste characterization, waste minimization and waste management practices.

Compliance Verification Criteria:

CNL shall characterize its waste streams and minimize the production of wastes taking into consideration the health and safety of workers and the environment, integrate waste management programs as a key element of the facility’s safety culture, and regularly audit its program to maximize its efficiency.

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N292.0	General principles for the management of radioactive waste and irradiated fuel	2014	April 1, 2018
CSA N292.2	Interim dry storage of irradiated fuel	2013 (R2015)	January 1, 2020
CSA N292.3	Management of low- and intermediate-level radioactive waste	2014	April 1, 2018

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-508600-PDD-001	Waste Management	5507946	N
900-508600-PRD-001	Waste Management	5507946	Y
CW-508600-PLA-002	CNL Integrated Waste Strategy	5507946	N

WASTE MANAGEMENT

Guidance:

Guidance Documents

Document Number	Document Title	Version
CSA N292.5	Guideline for the exemption or clearance from regulatory control of materials that contain, or potentially contain, nuclear substances	2011 (R2016)
CSA N292.6	Long-Term Management of Radioactive Waste and Irradiated Fuel	2018
REGDOC-2.11.1	Waste Management, Volume III: Assessing the Long-Term Safety of Radioactive Waste Management	May 2018

Licence Condition 11.2: Decommissioning Plan

The licensee shall implement and maintain a decommissioning plan.

Preamble:

Class I Nuclear Facilities Regulations requires that a licence application contain the proposed plan for decommissioning of the nuclear facility or of the site. The decommissioning plan for DPWF site is documented in the Douglas Point Waste Facility Detailed Decommissioning Plan – Volume 1 – Program Overview and the associated cost estimate.

DPWF is undergoing decommissioning in a staged manner. Consequently, it is noted that not all volumes of the detailed decommissioning plan have been developed, as they are developed when so required by CNL. For volumes not yet developed, decommissioning activities cannot proceed without CNSC concurrence.

Compliance Verification Criteria:

Facilities under Decommissioning

The licensee shall conduct decommissioning activities in accordance with Volumes 1 to 6 of the Douglas Point Waste Facility Detailed Decommissioning Plan. Decommissioning plans are reviewed by CNSC staff and decommissioning activities cannot proceed without CNSC concurrence.

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N294	Decommissioning of facilities containing nuclear substances	2009 (R2014)	July 25, 2014

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
22-00960-DDP-001	Douglas Point Waste Facility Detailed Decommissioning Plan Volume 1 - Program Overview	5794953	Y ¹
	Douglas Point Waste Facility Detailed Decommissioning Plan Volume 2 - Turbine Building, Administration Building, Ancillary Facilities (Carpenter's Shop, Water Treatment Area, Garage, Storage Area, and the Diesel Room), and Steam Bridge		Y ¹
	Douglas Point Waste Facility Detailed Decommissioning Plan Volume 3 - Purification Building, Service Building (including Ventilation Stack, Fuel Bays, and Active Liquid Handling System), Weld Test Shop Resin Storage Tanks and Vault		Y ¹
	Douglas Point Waste Facility Detailed Decommissioning Plan Volume 4 – Reactor Building Cleanout		Y ¹
	Douglas Point Waste Facility Detailed Decommissioning Plan Volume 5 – Spent Fuel Canister Area		Y ¹
	Douglas Point Waste Facility Detailed Decommissioning Plan Volume 6 - Reactor Building D&D (calandria, dome and the containment)		Y ¹
900-508300-PDD-001	Decommissioning and Demolition	5507946	N
900-508300-PRD-001	Decommissioning and Demolition	5507946	Y

¹ DDPs are to be reviewed and accepted by the CNSC in accordance with the requirements in CSA N294.

Guidance:

Guidance Documents

Document Number	Document Title	Version
G-219	Decommissioning Planning for Licensed Activities	2000

DRAFT

12. SCA – SECURITY

Licence Condition 12.1: Security Program

The licensee shall implement and maintain a security program.

Preamble:

The *General Nuclear Safety and Control Regulations* requires that a licence application contain information related to site access control and measures to prevent loss or illegal use, possession or removal of the nuclear substance, prescribed equipment or prescribed information.

The *Class I Nuclear Facilities Regulations* requires that a licence application contain the proposed measures to prevent acts of sabotage or attempted sabotage at the nuclear facility.

The *Nuclear Security Regulations* (NSR) require that a licence application contain specific information related to nuclear security, stipulates the requirements for high-security sites, and contains specific requirements pertaining to the transportation of Category I, II or III nuclear material.

The *Nuclear Security Regulations* requires that a licensee of a high-security site:

- maintain at all times a qualified onsite nuclear response force;
- obtain the applicable certifications, before issuing an authorization to a nuclear security officer;
- prevent and detect unauthorized entry into a protected area or inner area; and
- prevent unauthorized entry of weapons and explosive substances into a protected area or inner area.

Compliance Verification Criteria:

DPWF is a high-security site. The licensee shall implement a security program commensurate with the risk presented by the facility to prevent loss or illegal use, possession or removal of the nuclear substance, prescribed equipment or prescribed information.

The licensee shall submit the proposed security arrangements and measures for any modifications to the protected area that may be associated with the dismantlement activities.

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-508710-PDD-001	Security	5507946	N
900-508710-PRD-001	Security	5507946	Y
900-511400-PDD-001	Cyber Security	5507946	N
900-511400-PRD-001	Cyber Security	5507946	Y
EPS-1400-RPT-19	Douglas Point Site Security Report	5794953	Y

SECURITY

Guidance:

Guidance Documents

Document Number	Document Title	Version
RD-321	Criteria for Physical Protection Systems and Devices at High-Security Sites	2010
G-274	Security Programs for Category I or II Nuclear Material or Certain Nuclear Facilities	2003
REGDOC-2.12.2	Site Access Security Clearance	2013
REGDOC-2.12.3	Security of Nuclear Substances – Sealed Sources	2013
CSA N290.7	Cyber security for nuclear power plants and small reactor facilities	2014

13. SCA – SAFEGUARDS AND NON-PROLIFERATION

Licence Condition 13.1: Safeguards Program

The licensee shall implement and maintain a safeguards program.

Preamble:

The *General Nuclear Safety and Control Regulations* requires the licensee to take all necessary measures to facilitate Canada's compliance with any applicable safeguards agreement.

The *Class I Nuclear Facilities Regulations* requires that a licence application contain information on the licensee's proposed measures to facilitate Canada's compliance with any applicable safeguards agreement.

Canada has entered into a safeguards agreement with the International Atomic Energy Agency (IAEA) pursuant to its obligations under the Treaty on the Non-Proliferation of Nuclear Weapons. The objective of the Canada/IAEA Safeguards Agreement is for the IAEA to provide assurance on an annual basis to Canada and to the international community that all declared nuclear materials are in peaceful, non-explosive uses and that there is no indication of undeclared nuclear materials or activities. This conclusion confirms that Canada is in compliance with its obligations under the following Canada/IAEA Safeguards Agreement:

- [*Treaty on the Non-Proliferation of Nuclear Weapons*](#);
- [*Agreement Between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*](#); and
- [*Protocol Additional to the Agreement Between Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*](#).

These are reproduced in information circulars INFCIRC/140, INFCIRC/164, and INFCIRC/164/Add. 1.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.13.1	Safeguards and Nuclear Material Accountancy	2018	February 8, 2019

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-508510-PDD-001	Nuclear Materials and Safeguards Management	5507946	N
900-508510-PRD-001	Nuclear Materials and Safeguards Management	5507946	Y

Guidance:

None provided.

14. SCA – PACKAGING AND TRANSPORT

Licence Condition 14.1: Packaging and Transport Program

The licensee shall implement and maintain a packaging and transport program.

Preamble:

The *Class I Nuclear Facilities Regulations* requires that a licence application contain information on the proposed procedures for transporting nuclear substances.

Every person who transports radioactive material, or requires it to be transported, shall act in accordance with the requirements of the *Transportation of Dangerous Goods Regulations* (TDGR) and the *Packaging and Transport of Nuclear Substances Regulations*, 2015 (PTNSR).

The PTNSR and the TDGR provide specific requirements for the design of transport packages, the packaging, marking and labeling of packages and the handling and transport of nuclear substances.

Compliance Verification Criteria:

The licensee shall implement and maintain a packaging and transport program that will ensure compliance with the requirements of the TDGR and the PTNSR.

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-508520-PDD-001	Transportation of Dangerous Goods	5507946	N
900-508520-PRD-001	Transportation of Dangerous Goods	5507946	Y

Guidance:

Not applicable to this LC.

APPENDIX A: DEFINITIONS AND ACRONYMS

1. DEFINITIONS

Terms and expressions used in the LCH are consistent with the definitions provided in the NSCA, the regulations made pursuant to the NSCA, or in the CNSC regulatory document REGDOC-3.6 *Glossary of CNSC Terminology*.

2. ACRONYMS LIST

Acronym	Definition
AECL	Atomic Energy of Canada Limited
AL	Action Level
ALARA	As Low As Reasonably Achievable
CNEA	Canadian Nuclear Energy Alliance
CNL	Canadian Nuclear Laboratories
CNSC	Canadian Nuclear Safety Commission
CSA	Canadian Standards Association
CVC	Compliance Verification Criteria
DP	Douglas Point
DPWF	Douglas Point Waste Facility
G-1	Gentilly-1
GDI	Governing Document Indices
GNSCR	<i>The General Nuclear Safety and Control Regulations</i>
IAEA	International Atomic Energy Agency
INFCIRC	Information Circular
LC	Licence Condition
LCH	Licence Conditions Handbook
mSv	Millisievert
NBCC	National Building Code of Canada
NFPA	National Fire Protection Act
NPD	Nuclear Power Demonstration
NSR	<i>The Nuclear Security Regulations</i>
NSCA	<i>Nuclear Safety and Control Act</i>
PDD	Program Description Document
PRD	Program Requirements Document
PTNSR	<i>The Packaging and Transport of Nuclear Substances Regulations</i>
RP	Radiation Protection
RPR	<i>The Radiation Protection Regulations</i>
SAT	Systematic Approach to Training
SCA	Safety and Control Area
SSC	Structures, systems, and components
TDGR	<i>The Transportation of Dangerous Goods Regulations</i>
WFDL	Waste Facility Decommissioning Licence

APPENDIX A: DEFINITIONS AND ACRONYMS

CURRENT LICENCE

The current licence is provided on the following pages of the document.

e-Doc 5631490 (WORD)

e-Doc 5730798 (PDF)



WASTE FACILITY DECOMMISSIONING LICENCE

DOUGLAS POINT WASTE FACILITY

- I) LICENCE NUMBER:** WFDL-W4-332.02/2034
- II) LICENSEE:** Pursuant to section 24 of the *Nuclear Safety and Control Act*, this licence is issued to:
- Canadian Nuclear Laboratories Limited**
Laboratoires nucléaires canadiens limitée
286 Plant Road
Chalk River, Ontario
K0J 1J0
- III) LICENCE PERIOD:** This licence is valid from the date signed and remains in effect until **December 31, 2034**, unless otherwise suspended, amended, revoked, or replaced.
- IV) LICENSED ACTIVITIES:**
- This licence authorizes the licensee to:
- a) decommission the Douglas Point Waste Facility, as further described and located on the sites defined in the Licence Conditions Handbook associated with WFDL-W4-332.02/2034.
 - b) possess, transfer, use, process, package, manage, and store nuclear substances that are required for, associated with or arise from the activities described in a);
 - c) possess and use prescribed equipment and prescribed information that are required for, associated with or arise from the activities described in a) and b)

V) EXPLANATORY NOTES:

- (i) Nothing in this licence shall be construed to authorize non-compliance with any other applicable legal obligation or restriction.
- (ii) Unless otherwise provided for in this licence, words and expressions used in this licence have the same meaning as in the *Nuclear Safety and Control Act* and associated Regulations.
- (iii) The WFDL-W4-332.02/2034 Licence Conditions Handbook (LCH) identifies the criteria that will be used by Canadian Nuclear Safety Commission (CNSC) staff to assess the licensee's compliance with the conditions listed in the licence. The LCH also provides information regarding delegation of authority and applicable version control of documents.

VI) CONDITIONS:

1 GENERAL

- 1.1 The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis.
- 1.2 The licensee shall, in the event of any conflict or inconsistency between licence conditions, codes or standards or regulatory documents referenced in this licence, direct the conflict or inconsistency to the Commission, or a person authorized by the Commission, for resolution.
- 1.3 The licensee shall implement and maintain decommissioning policies, programs and procedures.
- 1.4 The licensee shall not make modifications to, or deviate from the design, operating conditions, purposes, methods, procedures or limits described in the safety analysis reports and/or operational limits and conditions documents that would result in an impact on health, safety or the environment that is different in nature or greater in magnitude or probability than that described in those documents without prior approval of the Commission or a person authorized by the Commission.
- 1.5 The licensee shall ensure that every contractor working at the facility complies with this licence.
- 1.6 The licensee shall implement and maintain a public information program and disclosure program.

2 DECOMMISSIONING

- 2.1 The licensee shall submit a Detailed Decommissioning Plan for acceptance by the Commission or a person authorized by the Commission prior to the commencement of dismantlement activities described in paragraph a) of Part IV of this licence.
- 2.2 The licensee shall provide a financial guarantee that remains valid, in effect and adequate to fund the future decommissioning of the facility as described in condition 13.2 of this licence that shall be reviewed and updated every 5 years, or when requested by the Commission or a person authorized by the Commission.

3 MANAGEMENT SYSTEM

- 3.1 The licensee shall implement and maintain a management system.

4 HUMAN PERFORMANCE MANAGEMENT

- 4.1 The licensee shall implement and maintain a human performance program.
- 4.2 The licensee shall implement and maintain a training program.

5 OPERATING PERFORMANCE

- 5.1 The licensee shall implement and maintain a process for reporting to the Commission or a person authorized by the Commission that includes reporting of all events required by the *Nuclear Safety and Control Act* and its Regulations.

6 SAFETY ANALYSIS

- 6.1 The licensee shall maintain a safety report for the facility.

7 PHYSICAL DESIGN

- 7.1 The licensee shall not make any change to the design or equipment that would result in impact on health, safety, or the environment that is different in nature or greater in magnitude than those considered by the safety report, without the prior written approval of the Commission or a person authorized by the Commission.

8 FITNESS FOR SERVICE

- 8.1 The licensee shall implement and maintain an aging management plan for the maintenance of systems, components and structures for the facility.

9 RADIATION PROTECTION

- 9.1 The licensee shall implement and maintain a radiation protection program.
- 9.2 The licensee shall provide the Commission or a person authorized by the Commission with notification within 7 calendar days of determining that an action level has been reached or exceeded and within 60 days submit a summary written report.

10 CONVENTIONAL HEALTH AND SAFETY

- 10.1 The licensee shall implement and maintain a conventional health and safety program.

11 ENVIRONMENTAL PROTECTION

- 11.1 The licensee shall implement and maintain an environmental protection program.

12 EMERGENCY MANAGEMENT AND FIRE PROTECTION

- 12.1 The licensee shall implement and maintain an emergency preparedness and response program.
- 12.2 The licensee shall implement and maintain a fire protection program.

13 WASTE MANAGEMENT

- 13.1 The licensee shall implement and maintain a waste management program.
- 13.2 The licensee shall maintain a preliminary decommissioning plan and cost estimate.

14 SECURITY

- 14.1 The licensee shall implement and maintain a security program.
- 14.2 The licensee shall not carry out the activities referred to in paragraph a) of Part IV of this licence that result in the modifications to the protected area until a submission of the proposed security arrangements and measures has been accepted by the Commission or a person authorized by the Commission.

15 SAFEGUARDS AND NON-PROLIFERATION

- 15.1 The licensee shall implement and maintain a safeguards program and undertake all measures required to ensure safeguards implementation.

16 PACKAGING AND TRANSPORT

- 16.1 The licensee shall implement and maintain a packaging and transportation program.

SIGNED at OTTAWA, this 8 day of Feb, 2019



Rumina Velshi, President
On behalf of the Canadian Nuclear Safety Commission