



Oral presentation

Exposé oral

Written submission from the City of Ottawa

Mémoire de la Ville d'Ottawa

In the Matter of the

À l'égard des

Canadian Nuclear Laboratories (CNL)

Laboratoires Nucléaires Canadiens (LNC)

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

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

**Commission Public Hearing
Part 2**

**Audience publique de la Commission
Partie 2**

May and June 2022

Mai et juin 2022



March 14th, 2022

Senior Tribunal Officer, Secretariat
Canadian Nuclear Safety Commission
280 Slater Street P.O. Box 1046, Station B
Ottawa, Ontario K1P 5S9

Re: City of Ottawa comments on proposed Near Surface Disposal Facility (NSDF) at Chalk River – IAA Reference Number 80122

Dear Commission Members,

The City of Ottawa appreciates the opportunity to provide comment on the proposed Near Surface Disposal Facility (NSDF) at Chalk River Laboratories. Over the last four years, our technical staff have reviewed information presented in various webinars, EIS Reports, and EA documents associated with the NSDF project. During that time, we have also held meetings with CNL, CNSC, and other stakeholders to improve our understanding of the project. We are pleased to report that we have received open and helpful communication from these various groups to explain the project and its implications to the natural environment. Our primary concern has been, and continues to be, the long-term protection of the Ottawa River, the primary source of drinking water for Ottawa's residents.

Our recommendations and concerns are provided to improve the design and operation of the NSDF, with a particular focus on the ongoing protection of the Ottawa River which in many respects is the lifeblood of our community. The City of Ottawa respectfully asks that the Commission take into consideration the recommendations attached. We trust that our comments will help the Commission in reaching a final decision, and in the drafting of requirements contained in the operating license, if approved.

Finally, we thank the Commission for the opportunity to submit our recommendations and concerns on behalf of the City of Ottawa.

If there are any questions about our comments, please feel free to contact the undersigned.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Ian Douglas".

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A handwritten signature in black ink, appearing to read "Tessa DiIorio".

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City of Ottawa comments on Chalk River Near Surface Disposal Facility (NSDF)
Written submission to Canadian Nuclear Safety Commission
March 14th, 2022

Submitted by:

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Position

In principle, we are supportive of the proposed NSDF as a means of providing improved environmental protection and engineered storage for low-level radioactive waste. We recognize that most (90%) of the waste already exists on the Chalk River Laboratories (CRL) site and is currently located in close proximity to the river. In our opinion, maintaining a viable and active site for scientific work at Chalk River, along with careful regulatory oversight and monitoring, is the best way to ensure environmental stewardship and protection for the long-term. We are interested in science-based risk assessments, and support projects that will minimize risks to the environment. At the same time, we need to be mindful of our resident's concerns and our limitations to treat/remove some of the radioactive substances that might originate from CRL. Therefore, we submit the following comments for the proposed NSDF and its related activities.

- i. **Weather shield system for NSDF** – it is important to minimize the amount of rainfall/snow that mixes with NSDF stored waste which must then be collected, treated, and discharged to the natural environment. The Final EIS Report (Section 3.4.1.9.1) describes a soil/tarp/fixative cover barrier that will be deployed daily to minimize seepage of rain/snow into the facility, which we feel provides only minimal environmental protection. In previous discussions, we had suggested the use of a temporary roof/tarp system to divert rainfall away from the operating face of the facility, as has been done in some European facilities. During technical discussions with CNL during 2021, we learned that there were plans underway to design a weather-shield system that could divert water away from the operating face of the containment mound. While we were encouraged to hear about the weather-shield system, we do not see it described or represented anywhere in the EA or Final EIS Reports. **Recommendation:** that the weather-shield system be included as a requirement of the NSDF operating license to minimize the impact of rain/snow and subsequent collection, treatment, and discharge to the natural environment.

- ii. **Safeguards to protect river during demolition and waste transfer activities** – it is important to protect the river during all activities related to site demolition and waste transfer activities. It is our understanding that a number of standard operating procedures for waste handling would be required as part of licensed activities at the CRL site. However, we recommend that safeguards to specifically protect the river be included in the operating license of the NSDF. For example, misting is often used during demolition to minimize airborne particles that might be radioactive. However, CNL should consider the use of temporary berms, tarps, sumps, etc. to specifically protect the river from any surface run-off from the demolition site until all waste is safely characterized, transferred, and stored. Given the slope of the production site and proximity to the river, we are concerned that substantial rainfall/snowfall could lead to surface and sub-surface run-off that may contain radioactive contaminants. We do not see any such measures noted or referenced in the EIS/EA report. **Recommendation:** that the operating license for the NSDF include safeguards to protect the river from surface and subsurface run-off during all site demolition and waste transfer activities.

- iii. **Criteria for water discharge from NSDF wastewater treatment plant** –the Final EIS Report Table 3.4.2-2 *Radionuclide Concentrations in Wastewater and Effluent Discharge Targets* specifies that the wastewater treatment effluent will meet Canadian Drinking Water Quality Guidelines (CDWQG) or CCME Aquatic Guidelines prior to discharge. From a drinking water risk perspective, we support the application of these criteria since they will ensure that radionuclide concentrations are well within acceptable limits in the Ottawa River. The WWTP design appears to be robust and capable of removing almost all radionuclide substances. However, we would like to see the criteria specified in the operating license, including the sample location, test frequency, reporting requirements, and regulatory oversight for test results. It is our understanding that wastewater treatment will be carried out on a batch basis once a sufficient volume has been collected and stored. We expect that the release of wastewater effluent requires that individual batch test results meet the discharge criteria prior to release, rather than the use of a long-term average concentration (eg. quarterly, annual). **Recommendations:** that the operating licence for NSDF clearly state the criteria in Table 3.4.2-2 for discharge of treated wastewater including requirements for sampling, testing, reporting, and regulatory oversight. For tritium specifically, the discharge criteria should be modified to meet the Health Canada drinking water guideline of 7,000 Bq/L at all times in the NSDF wastewater effluent discharge. Lastly, chemical and radiological test results for the WWTP discharge should be included as part of CRL’s routine environmental monitoring reports to demonstrate compliance with effluent discharge criteria.
- iv. **Additional measures to minimize H3-Tritium and Cobalt-60 in NSDF wastewater** – the Final EIS Report Table 3.4.2-2 *Radionuclide Concentrations in Wastewater and Effluent Discharge Targets* shows predicted radionuclide maximum concentrations in the NSDF wastewater treatment influent, all of which are expected to meet drinking water standards except for three radionuclides that will require treatment:

Radionuclide	Maximum concentration in wastewater influent prior to treatment (Bq/L)	Effluent target concentration after treatment (Bq/L)	*Drinking Water Guideline Maximum Acceptable Concentration (Bq/L)
Cobalt-60	1,300	40	40
Strontium-90	9.6	5	5
Tritium- ³ H	140,000	360,000	7,000

**Guidelines for Canadian Drinking Water Quality, Radiological Parameters (Health Canada, 2009)*

The tritium concentration is estimated to be 140,000 Bq/L in the wastewater influent, with an allowable discharge limit of 360,000 Bq/L. Both of these concentrations greatly exceed the Canadian Drinking Water Guideline of 7,000 Bq/L, by 20 to 50 times respectively. Once in the water phase, tritium is highly mobile in the natural environment and cannot be removed through treatment, either in the wastewater treatment system or in any of the water treatment plants located further downstream from Chalk River. Since the NSDF only accepts low-level solid waste, there should be design measures that can be taken to minimize water contact and leaching such that the tritium drinking water guideline of 7,000 Bq/L can be achieved at all times in the NSDF effluent discharge.

A similar comment is made for Cobalt-60 levels estimated to be a maximum of 1,300 Bq/L in the NSDF wastewater collected. Although the treatment system is robust for the removal of most radionuclides, efforts should be made to ensure that Cobalt-60 materials remain in the solid-phase and be well shielded from water contact and/or leaching while in safe storage. **Recommendation:** that measures be taken to immobilize radionuclides and ensure “dry” storage conditions to minimize/eliminate leaching of radionuclides into the NSDF wastewater stream. As an example, this might require the use of secondary containment vessels and/or operation of the weather-shield system – see item (i) above. Such requirements should be incorporated into the operating license for the NSDF.

- v. **Trace organic substances in NSDF wastewater** – the Final EIS Report *Table 3.4.2-3* notes several organic substances that would exceed drinking water or aquatic discharge guidelines in the WWTP influent: *anthracene, chloroform, chrysene, ethylene dibromide, and fluoranthene*. While the WWTP is designed to remove these substances during treatment, efforts should be made to minimize these chemical substances during waste transfer and storage. **Recommendation:** that low-level waste materials containing these chemical substances be modified to minimize or eliminate leaching into the WWTP influent. As an example, this might require the use of secondary containment vessels and/or operation of the weather-shield system.
- vi. **WWTP discharge to Perch Lake vs. subsurface** – the EIS Report notes two options for discharge of treated wastewater effluent: (i) injection into subsurface groundwater through an exfiltration gallery, or (ii) direct discharge to Perch Lake, which in turn discharges to the Ottawa River via Perch Creek. We recommend that the WWTP effluent, once confirmed to meet acceptable discharge criteria, be released to Perch Lake. Discharging the effluent into the subsurface aquifer will only add to the burden of radionuclides (eg. tritium) already present in the groundwater. Further, a subsurface discharge represents a less controlled release that is more difficult to monitor, and its environmental effect deferred into future decades. Lastly, operating the NSDF to meet CDWQG criteria maintains the operational focus on optimizing treatment and waste handling at its source. **Recommendation:** design and operate the NSDF to minimize leaching of radionuclides such that the final WWTP effluent concentrations meet Health Canada guidelines for drinking water at the point of discharge into Perch Lake rather than discharge into the subsurface aquifer.
- vii. **Import of radioactive waste from external AECL sites** – the EIS report states that 5% of material to be stored in the NSDF is expected to originate from other AECL sites outside of the watershed. The City of Ottawa does not support the import of radioactive waste from external sites (eg. Manitoba, Quebec) since it increases risk to the Ottawa River ecosystem, albeit incrementally. While it may be cost-effective and advantageous to CNL to do so, given the length of time for design/approval of waste storage facilities, it is counter to the principle of managing waste within the localized area of its generation. For the same reason, we would not recommend to export waste from the Chalk River site to another watershed even if the risk increases only incrementally. **Recommendation:** that the stored waste directed to the NSDF be limited only to on-site legacy waste (90%) and expected contract waste (5%) from the Ottawa area (hospitals, research, etc.).
- viii. **Prompt notification of spill or release to river for NSDF** – since the City of Ottawa and many other communities rely on the Ottawa River as their primary source of drinking water, it is imperative that municipalities be promptly notified of any spill or unexpected release that might affect river water quality. Such notification would allow the City of Ottawa to form an immediate risk assessment and response plan, noting that contaminants would reach our treatment plant intakes within 5 - 25 days depending on river flow. Depending on the severity of the release, City response plans might include additional water quality sampling, treatment adjustments, provision of alternate drinking water, public health communications, etc. We presume that notification procedures are already in place for CNL through environmental regulations and oversight by the CNSC. **Recommendation:** that spill notification protocols be confirmed with downstream municipalities using the Ottawa River as a source of drinking water. The notification protocol and contact list should be tested annually. This recommendation applies to the NSDF and all related demolition/transfer activities as well as the CRL site in general.
- ix. **Timely access to water quality data for Ottawa River** – for over 30 years, the City of Ottawa has conducted routine monitoring of radioactivity at both water treatment plants, based on daily samples. The results for the last 15 years have shown consistently low or background levels for alpha, beta, and tritium radioactivity. We are aware that CNL conducts routine environmental monitoring including samples taken from the Ottawa River, upstream and downstream of the site. We would appreciate receiving such test results on regular basis (eg. quarterly) to compare with levels observed at our treatment plants, and to respond to any deviations observed. In a reciprocal manner, the City of Ottawa would be pleased to share ongoing test results of our routine radiological monitoring with CNL or CNSC if desired. **Recommendation:** that radiological test results for the Ottawa River upstream

and downstream of the Chalk River site be published or shared in a timely manner (eg. quarterly) with downstream municipalities, for the purposes of data comparison and environmental trending.

- x. **Environmental risk comparison for design alternatives** – during our review of the NSDF documents, we did not find satisfactory explanation to demonstrate the relative risk comparison for various waste management options. The *Final EIS Report (Section 2.5)* describes several options that were evaluated during the early phase of the project, prior to selecting the NSDF design. We recommend that the onus should be on the applicant to demonstrate that the selected option represents the best environmental protection in terms of air, soil, and water quality – even in the face of higher capital and operating costs. Long-term protection of the natural environment including the Ottawa River should be paramount in the risk ranking of alternatives. **Recommendation:** that all future environmental projects include a transparent risk ranking of alternatives with a public commenting period prior to selecting the preferred design option. It is possible that the revised Impact Assessment Act (IAA, 2019) already incorporates this step in the consultation and approval process.

In summary, the City of Ottawa respectfully request that the Commission take into consideration these recommendations. We trust that our comments will help the Commission in reaching a final decision, and in the drafting of requirements contained in the operating license, if approved. Our recommendations and concerns are provided to improve the design and operation of the NSDF, with a particular focus on the ongoing protection of the Ottawa River which in many respects is the lifeblood of our community as our primary source of drinking water.

Finally, we thank the Commission for the opportunity to submit our recommendations and concerns on behalf of the City of Ottawa.