



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

Record of Decision

In the Matter of

Applicant Canadian Nuclear Laboratories

Subject Application to Amend the Waste Nuclear
Substance Licence for the Port Hope Project

Date of
Decision November 29, 2017

RECORD OF DECISION

Licensee: Canadian Nuclear Laboratories Limited

Address/Location: Port Hope Area Initiative, Management Office, 115
Toronto Road, Port Hope ON, L1A 3S4

Purpose: Application to Amend the Waste Nuclear Substance
Licence for the Port Hope Project

Application received: October 5, 2016

Date of decision: November 29, 2017

Location: Canadian Nuclear Safety Commission (CNSC)
280 Slater St., Ottawa, Ontario

Panel of Commission: M. Binder, President

Licence: Amended

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1.0 INTRODUCTION

1. Canadian Nuclear Laboratories Limited (CNL) has submitted an application to the Canadian Nuclear Safety Commission¹ (CNSC) under subsection 24(2) of the *Nuclear Safety and Control Act*² (NSCA) for an amendment to its Waste Nuclear Substance Licence (WNSL) for the Port Hope Long-Term Low-Level Radioactive Waste Management Project (Port Hope Project) located in Port Hope, Ontario. The current licence, WNSL-W1.2310.01/2022, expires on December 31, 2022.
2. The Port Hope Project is part of the Port Hope Area Initiative (PHAI) which has as its objective to develop and implement a safe, local and long-term management solution for low-level radioactive waste (LLRW) in the municipalities of Port Hope and Clarington, Ontario. The Port Hope Project includes the construction of the Long-Term Waste Management Facility (LTWMF) for LLRW, the remediation of the existing Welcome Waste Management Facility (Welcome WMF) and the remediation of sites containing historic LLRW located within the Municipality of Port Hope.
3. In its application, CNL requested a licence amendment regarding the clean-up criterion of 40 parts per million (ppm) for arsenic as specified in Appendix C of CNL's WNSL. CNL requested that the soil under portions of and in close proximity to the future Cell 1 and Cell 2A/B of the LTWMF be excluded from the clean-up criterion for arsenic.

Issues

4. In considering the application, the Commission considered:
 - a) what environmental assessment review process to apply in relation to this application;
 - b) whether CNL is qualified to carry on the activity that the amended licence would authorize; and
 - c) whether, in carrying on that activity, CNL would 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.

¹ The *Canadian Nuclear Safety Commission* is referred to as the "CNSC" when referring to the organization and its staff in general, and as the "Commission" when referring to the tribunal component.

² Statutes of Canada (S.C.) 1997, chapter (c.) 9.

Hearing

5. Pursuant to section 22 of the NSCA, I established myself as a Panel of one Commission Member to hear the application. The Commission, in conducting a public hearing based on written materials, considered written submissions from CNL (CMD 17-H101.1 and CMD 17-H101.1A) and CNSC staff (CMD 17-H101 and CMD 17-H101.A). The Commission also considered written submissions from two intervenors (see Appendix A for a list of interventions).

2.0 DECISION

6. Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Decision*, the Commission concludes that CNL satisfies the conditions of subsection 24(4) of the NSCA. Therefore,

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, amends the Waste Nuclear Substance Licence WNSL-W1.2310.01/2022 issued to Canadian Nuclear Laboratories Limited for its Port Hope Long-Term Low-Level Radioactive Waste Management Project located in Port Hope, Ontario. The amended licence, WNSL-W1.2310.02/2022, is valid until December 31, 2022.

7. The Commission amends CNL's WNSL to include a footnote to the arsenic clean-up criterion in the table *Clean Up Criteria for Remediation – Phase II* located in Appendix C of WNSL-W1.2310.01/2022 which shall read:

“Soils subject to an alternative management strategy, as delineated in Figure A on page 7, are excluded from the Phase II clean-up criterion for arsenic.”

8. As recommended by CNSC staff, the Commission also includes on page 7 in Appendix C of the amended WNSL “Figure A” which shows the specific location of the LTWMF site to which this amendment relates. To be clear, this amendment only affects the LTWMF site and does not extend to areas outside the LTWMF.
9. In 2014, the Commission approved the transfer of this WNSL from Atomic Energy of Canada Limited to CNL.³ At this time, a licence transfer cover page was added to the licence. The Commission is of the view that this licence transfer cover page is no longer required and, with this amendment, the Commission removes the transfer cover page from the licence, as recommended by CNSC staff.

³ Canadian Nuclear Safety Commission *Record of Proceedings, Including Reasons for Decision – Atomic Energy of Canada Limited, Request for Five Licence Transfers to, and Request for Two Specific Exemptions for, Canadian Nuclear Laboratories Limited*, October 2014.

10. The Commission notes that CNSC staff plans to undertake licence modernization activities at the time of the next licence amendment or renewal at which time the licence would be updated to be in the standard format and use the standard licence conditions, as well as licence conditions handbook, applicable to this type of facility.

3.0 ISSUES AND COMMISSION FINDINGS

3.1 Application of *Environmental Assessment Act, 2012*

11. In coming to its decision, the Commission was first required to determine whether an Environmental Assessment (EA) under the *Canadian Environmental Assessment Act, 2012*⁴ (CEAA 2012) was required.
12. In its application, CNL submitted a request to amend the clean-up criterion for arsenic, as provided for by Appendix C of its WNSL-W1.2310.01/2022, below the future Cell 1 and Cell 2A/B of the LTWMF. The Commission notes that the proposed change is not a designated project under CEAA 2012 and that Section 67 does not apply to the activities that would be covered under the amended licence.
13. The Commission considered the completeness and adequacy of the EA that CNSC staff conducted under the NSCA for this licence amendment. CNSC staff's conclusions included:
 - CNL has provided sufficient documentation and evidence showing that the in-situ management of the arsenic contaminated soils within the LTWMF site was not expected to produce environmental releases off-site.
 - CNL has and will continue to maintain adequate environmental protection programs that meet CNSC requirements.
14. Based on the information examined and provided on the record for this hearing, the Commission is satisfied that an EA under CEAA 2012 was not required in this matter. The Commission concludes that an EA conducted under the NSCA and its regulations was appropriate for CNL's licence amendment application. Further, the Commission is satisfied that CNL has made, and will continue to make, adequate provision for the protection of the environment and the health of persons in relation to the licensed activities throughout the licence period.

3.2 Matters for Consideration

15. The Commission notes that the Port Hope Project is in Phase II which includes the construction of a LTWMF, the integration of waste from the existing Welcome WMF into the future Cell 1 of the LTWMF, and the clean-up and remediation of off-site historic LLRW in the community of Port Hope.

⁴ S.C. 2012, c. 19.

16. CNL's current licence, WNSL-W1-2310.01/2022, includes a table with soil remediation clean-up criteria for Phase II of the Port Hope Project. The table specifies clean-up criteria for the 21 contaminants of primary concern (COPC) including arsenic, for which the clean-up criterion at the LTWMF site was 40 ppm.
17. CNL submitted that the arsenic remediation objective could not be met under the location of the future Cell 1 and Cell 2A/B of the LTWMF due to a continuous influx of arsenic-contaminated groundwater which re-contaminated the soil. CNL submitted that the Welcome WMF was the source of the arsenic plume. CNSC staff confirmed that the plume of arsenic-contaminated water was flowing under the location of the future Cell 1 and Cell 2A/B, where the Welcome WMF was planned to be relocated, eventually eliminating the arsenic plume source. CNSC staff further submitted that it had reviewed data from CNL and confirmed CNL's assessment in regard to the arsenic plume.
18. CNL submitted to the Commission that, since the source of the arsenic plume was the Welcome WMF and Cell 1 was the intended new repository for the waste in the Welcome WMF, the source of the arsenic plume could not be eliminated until Cell 1 was constructed. Further, CNL submitted that the arsenic-contaminated soil under Cell 1 and Cell 2A/B could not be excavated following construction and that, for this reason, CNL was requesting to manage the arsenic in-situ. CNSC staff confirmed the information provided by CNL and submitted that its review of CNL's data showed that the concentration of arsenic in soil under the future Cell 1 and Cell 2A/B of the LTWMF would typically remain at less than 60 ppm. CNSC staff noted that the majority of borehole samples from soil characterization campaigns had an arsenic concentration in soil of less than 60 ppm, with the maximum concentration measured at 130 ppm.
19. The Commission notes that an intervenor, John D. Morand, expressed concerns about whether sufficient boreholes were included in the soil characterization campaign. CNL submitted information to the Commission regarding the three sampling and characterization campaigns that were carried out at the LTWMF site, noting that 47 boreholes had been drilled and characterized since 2014, not five as suggested in the intervention. CNSC staff confirmed the information provided by CNL. The Commission is satisfied that CNL carried out appropriate soil characterization activities in regard to this licence amendment request.
20. CNL submitted to the Commission that the arsenic-contaminated groundwater plume from the Welcome WMF would continue to be captured by the on-site groundwater collection system and treated by the on-site waste water treatment plant (WWTP), thus not escaping to the environment beyond the LTWMF site. CNSC staff confirmed to the Commission's satisfaction that the groundwater would continue to be collected and treated, as per the site's original design. CNSC staff also confirmed CNL's assessment that, once the source of arsenic was removed, the groundwater would gradually flush the arsenic out of the soil and that CNL's modelling demonstrated that the soil would meet the arsenic clean-up criterion of 40 ppm through natural attenuation within approximately 80 years.

21. CNSC staff recommended to the Commission that the following footnote for the arsenic remediation criterion be added to the table *Clean-up Criteria for Remediation – Phase II* located in Appendix C of the current WNSL:

“Soils subject to an alternative management strategy, as delineated in Figure A on page 7, are excluded from the Phase II clean-up criterion for arsenic.”

CNSC staff proposed that this footnote be included in the WNSL to ensure clarity and transparency in regard to the arsenic concentration that would be present in some areas after completion of Phase II of the Port Hope Project. CNSC staff also recommended to the Commission that a map showing the location of the arsenic clean-up criterion excluded areas be included as Figure A on page 7 of the amended licence.

22. In response to the recommendation from the Municipality of Port Hope to include a maximum arsenic concentration for the soil under Cell 1 and Cell 2A/B, CNSC staff submitted to the Commission that the decision to not set an upper bound was a risk-informed decision. CNSC staff further submitted that excavation below the LTWMF mound presented soil stability issues and that, due to the existing arsenic plume, any clean fill placed in that area would be re-contaminated. The Commission is satisfied the risk-informed approach taken in regard to this issue is appropriate and that an upper bound for arsenic concentration in the soils considered in this matter is not required.
23. The Commission notes that, in its written intervention, the Municipality of Port Hope indicated that it had no objection to CNL’s licence amendment request. However, the Commission notes the Municipality’s concern that the proposed footnote in the amended licence would not specify that the amended arsenic clean-up criterion would not apply to Highland Drive Landfill. CNL submitted to the Commission that its amendment request was limited to the LTWMF site and that the amended arsenic clean-up criterion was not intended to apply to the Highland Drive Landfill. CNSC staff submitted that Figure A on page 7 of the proposed amended licence clearly indicated the location to which the amendment applied and that there was no ambiguity in this regard. The Commission is satisfied with the information submitted in this regard and agrees that Figure A, as proposed, is sufficient to delineate the area of the LTWMF site to which this amendment would apply.

Arsenic Migration

24. CNL reported to the Commission that the arsenic-contaminated groundwater was contained in a sand layer between the surface of the soil and a till layer with low hydraulic conductivity, limiting the migration of arsenic beyond the upper sand layer. CNL also submitted that, based on its monitoring data, CNL found that there were no exposure pathways for the arsenic plume that would cause an impact on human health or the environment. However, CNL reported that sentinel wells would be used to identify if the arsenic plume bypassed the interceptor ditch.

25. CNSC staff confirmed the information provided by CNL and reported that, following its review of monitoring data provided by CNL, CNSC staff was of the opinion that the groundwater in the upper sand unit was fully captured by the interceptor ditches and sent for treatment to the Port Hope Project WWTP. CNSC staff also submitted that the arsenic-contaminated soil would be beneath the LTWMF burial mound which provided a physical barrier between the arsenic contaminated soil and receptors. CNSC further confirmed to the Commission that its reviews showed that there were no anticipated off-site impacts from this alternate management strategy for arsenic contamination at the site.
26. CNSC staff informed the Commission that its regulatory oversight would ensure that CNL continued groundwater treatment until impacts from the arsenic plume on the groundwater were no longer observed. CNSC staff also informed the Commission that, through the CNSC Independent Environmental Monitoring Program, sampling of the environment around the LTWMF site would continue to be carried out to verify that the public and the environment remained protected.
27. In its intervention, the Municipality of Port Hope recommended that additional groundwater monitoring be implemented at the LTWMF site to ensure early detection of increased arsenic concentrations or unexpected arsenic migration. CNL submitted information to the Commission regarding the adequacy of its sentinel wells which ensured the detection of arsenic at the LTWMF site boundary. CNSC staff confirmed the information provided by CNL and indicated that the current monitoring threshold of 50% of the Ontario Provincial Water Quality Objectives⁵ that CNL used for the sentinel wells was protective of human health and the environment. The Commission is satisfied that CNL has adequate systems in place to monitor arsenic migration at the LTWMF site.
28. With reference to the written submission from John D. Morand, the Commission notes the intervenor's concern regarding the WWTP not having sufficient capacity to manage the contaminated groundwater. CNSC staff explained that, based on its review of data submitted by CNL, the WWTP did not require a design modification to be able to manage the contaminated groundwater and that its operating life was sufficient to cover the duration of time required for the arsenic concentration to naturally attenuate. The Commission is satisfied with the information submitted in this regard.
29. The Commission notes that the interventions received in this matter from the Municipality of Port Hope and John D. Morand expressed concerns about additional COPCs, such as lead, in the Welcome WMF plume. CNSC staff submitted that CNL's licence amendment request was only in respect of the arsenic clean-up criterion and that other COPCs would be remediated as provided for by CNL's licence. The Commission is satisfied that this is the case and that this amendment has no effect on any other COPCs.

⁵ Ontario Provincial Water Quality Objectives, <https://www.ontario.ca/page/water-management-policies-guidelines-provincial-water-quality-objectives#section-2>, Province of Ontario, 1994.

30. Based on the information considered for this hearing, the Commission is satisfied that, over time, the soil under the future Cell 1 and Cell 2A/B will meet the 40 ppm clean-up criterion for arsenic. The Commission is also satisfied that the public and the environment will be protected in the interim through the measures in place to treat the groundwater and detect any unexpected arsenic plume migration.

Public Engagement


31. In its intervention, the Municipality of Port Hope expressed concerns about the level of public and stakeholder engagement that CNL carried out in respect of this licence amendment request. The Municipality of Port Hope further submitted that CNL and CNSC staff should consider the Municipality's role as a primary stakeholder in the Port Hope Project, should future amendments to the WNSL be requested. CNL submitted to the Commission information regarding its consultation and engagement with the Municipality of Port Hope, including protocols that CNL had with the Municipality as both a stakeholder and the property owner of a large number of the impacted areas in the PHAI. CNSC staff noted that licence condition 2.4 of CNL's WNSL required CNL to maintain a public information and disclosure program (PIDP) and that, following its review, CNSC staff was satisfied that CNL's PIDP and consultation carried out in regard to this licence amendment met CNSC expectations and licensing requirements. Based on the information examined for this hearing, the Commission is satisfied that CNL appropriately consulted stakeholders in regard to this licence amendment application. The Commission acknowledges the existence of additional consultation protocols and agreements that CNL has with the Municipality of Port Hope. Although it is not within the Commission's mandate to enforce these protocols and agreements, the Commission hopes that CNL will abide by them in good faith.
32. In response to the Municipality of Port Hope's intervention which indicated that it was not provided with adequate documentation or time to comment on CNL's licence amendment request, CNSC staff provided the Commission with information regarding the documentation that was provided to this intervenor. The Commission notes that all technical enclosures for CNL's application were available upon request to the CNSC in this matter. The Commission also notes that the 30-day intervention period that was provided in this matter was in line with the *Canadian Nuclear Safety Commission Rules of Procedure*.⁶ On this basis, the Commission is satisfied that the public was provided with adequate opportunity and documentation to submit interventions in this matter.

⁶ SOR/2000-211.

4.0 CONCLUSIONS

33. The Commission has considered the information and submissions from CNL and CNSC staff, as well as from intervenors.
34. The Commission considers the environmental review that was conducted by CNSC staff under the NSCA to be acceptable and thorough. The Commission is satisfied that an EA under CEAA 2012 was not required for the CNL licence renewal application. The Commission further notes that the NSCA and its regulations provide for the protection of the environment and the health and safety of persons, and is satisfied that CNL will continue to adequately provide these protections.
35. On the basis of the Commission's conclusions, the Commission amends Appendix C of WNSL-W1.2310.01/2022 as recommended by CNSC staff in CMD 17-H101 to include a footnote to the arsenic clean-up criterion in the table *Clean Up Criteria for Remediation – Phase II* which shall read:

“Soils subject to an alternative management strategy, as delineated in Figure A on page 7, are excluded from the Phase II clean-up criterion for arsenic.”
36. The Commission includes in Appendix C of the amended WNSL “Figure A” as recommended by CNSC staff. Figure A shows the specific location of the LTWMF site to which this amendment relates.
37. The Commission also amends WNSL-W1.2310.01/2022 to remove the transfer cover page from the licence.



Michael Binder
President
Canadian Nuclear Safety Commission

NOV 29 2017

Date

Appendix A – Intervenors

Municipality of Port Hope	17-H101.2
John D. Morand	17-H101.3