



Supplementary Information

Presentation from Anna Tilman

In the Matter of the

Canadian Nuclear Laboratories

Application to renew its waste nuclear
substance licence for the Port Hope Project

Commission Public Hearing

November 22, 2022

Renseignements supplémentaires

Présentation d' Anna Tilman

À l'égard de

Laboratoires Nucléaires Canadiens

Demande concernant le renouvellement du
permis de déchets de substances nucléaires
pour le projet de Port Hope

Audience publique de la Commission

22 novembre 2022

Presentation to the Canadian Nuclear Safety Commission (CNSC)

**Canadian Nuclear Laboratories (CNL)
Application for Renewal of its Waste Nuclear
Substance Licence for a 10-year period.**

November 22, 2022

Anna Tilman

Port Hope Area Initiative (PHAI) Background and Overview

PHAI: A federal government initiative - includes the Port Hope Long-Term Waste Management Project (Port Hope Project) and Port Granby Long-Term Waste Management Project (Port Granby Project).

This commitment involves the clean-up and long-term safe management of the historic low-level radioactive wastes in the Port Hope area resulting from activities of Eldorado Nuclear (a former federal Crown Corporation) and its private sector predecessors.

CNL's current licence activities – re PHAI

- Port Hope Project (PHP): involves the construction and operation of a long-term waste management facility (LTWMF), a Wastewater Treatment Plant (WWTP) and supporting infrastructure for the long-term management of approximately 1.2 million cubic metres of historic low-level radioactive waste;
- Port Granby Project (PGP): involves the construction and operation of a LTWMF, a WWTP and supporting infrastructure for the long-term management of approximately 1.3 million tonnes of historic low-level radioactive waste
- The Pine Street Extension Temporary Storage Site (PSETSS) and the Port Hope Radioactive Waste Management Facility (PHRWMF) - small temporary storage sites primarily used for short-term storage of soils contaminated with low-level radioactive waste.

CNL's Licence Renewal Request

CNL's Waste Nuclear Substance Licence (WNSL) expires December 31, 2022. It has applied to CNSC to:

1. Renew the PHP WNSL and consolidate the PHP licence with three other WNSLs associated with the PHAI into a single WNSL for a 10-year licence term.
2. Incorporate effluent release limits for the PHP WWTP into the licensing basis.
3. Meet the applicable requirements of the CNSC's waste management and decommissioning regulatory documents for the PHAI.

CNSC's Staff Conclusion: CNL's renewal application has provided "adequate provision for the protection of the environment and health and safety of persons"

CNSC Staff's Conclusion

CNL's licence renewal application has provided "adequate provision for the protection of the environment and health and safety of persons".

However,

This "conclusion" fails to consider the potential for unknown or unanticipated circumstances that could arise over a 10-year licence period – e.g., limitations and delays in clean-up operations, workplace safety, the capacity to transport and store all the historic waste safely.

It could result in CNL requesting changes in clean-up criteria and effluent release limits for specific substances.

PORT HOPE – THE HISTORY AND LEGACY OF WASTES

- Eldorado Gold Mines Ltd. opened its radium refinery in Port Hope in 1932 in the middle of the town's waterfront, looming over the harbour. It is the oldest nuclear facility in the world.
- The federal government took ownership of the refinery in the 1940s, and began dismantling facilities that had been used for the production of radium.
- From 1939 until 1948, these residues were taken to several locations, schoolyards, homes, etc., in and around town, and in dumps, the harbour, and incorporated into building materials.
- Consequently, many sites in the Port Hope area became contaminated. No warning was given to the people who used these discarded materials.

PORT HOPE – THE FATE OF THE WASTES

- In 1975, extraordinarily high levels of radon gas were detected at St. Mary's elementary school, built a decade earlier over radioactive fill from the plant.
- By 1982, about 100,000 tonnes of severely contaminated soil and materials were removed from hundreds of homes and gardens in town and transported to AECL's Chalk River facility.
- Chalk River ran out of capacity. No other community wanted the waste. The "cleanup" ceased abruptly.
- In 2004, radioactive contamination from radon was discovered at Dr. L.B. Powers Public School. AECL traced the contamination back to 1978.
- Approximately 1.2 million m³ of uranium-and radium-contaminated soil reside in and around Port Hope, in roadbeds, ravines and parks, the municipal landfill, private homes, schoolyards, farm fields, the public beach, and the local harbour.

THE LEGACY WASTES

- In 1982, responsibility for this waste was placed under the federal government's newly created Low-Level Radioactive Waste Management Office (LLWMO).
 - **The Welcome facility:** designed to house all the designated contaminated waste from Port Hope and waste from the previous storage facility at that site. Remediation of residential properties commenced in early 2018. Once complete, the storage mound is to be sealed, covered with grass, and become a park.
 - **The Port Granby site:** intended to store the radioactive waste that lies in the old site which is officially capped and closed. Approval has been given to alter the legal agreement (which did not permit transfers from one municipality to another) and now allow for hundreds of truckloads of sludge from there to the Port Hope temporary storage facility over the next 3 years.¹

¹ <http://www.phai.ca/en/porthope/phases.html>

<http://www.nuclearsafety.gc.ca/eng/commission/pdf/2011-09-27-Decision-PortGranby-e-Edocs3846017.pdf>

Clean –Up Criteria Change: Uranium and Arsenic

CNL's original licence application, March 2020: Request for a change in clean-up criteria for arsenic and uranium:

- Arsenic level increase from 18 ppm to 56 ppm.
- Remove the current uranium criterion of 23 ppm.

The current criteria would leave soil levels of uranium up to 23 ppm, exceeding the Ontario Ministry of Environment (MOE) soil standard (2011) of 2.5 ppm. (The MOE soil standard for arsenic of 18 ppm would be met.)

Resolution?

CNSC staff and Health Canada determined that there was insufficient evidence to support the selection or use of the proposed arsenic clean-up criteria.

- On March 4, 2022, CNL submitted an amendment to its application, removing its request for changes to the clean-up criteria.

Port Hope Harbour & Centre Pier

The Port Hope Harbour site:

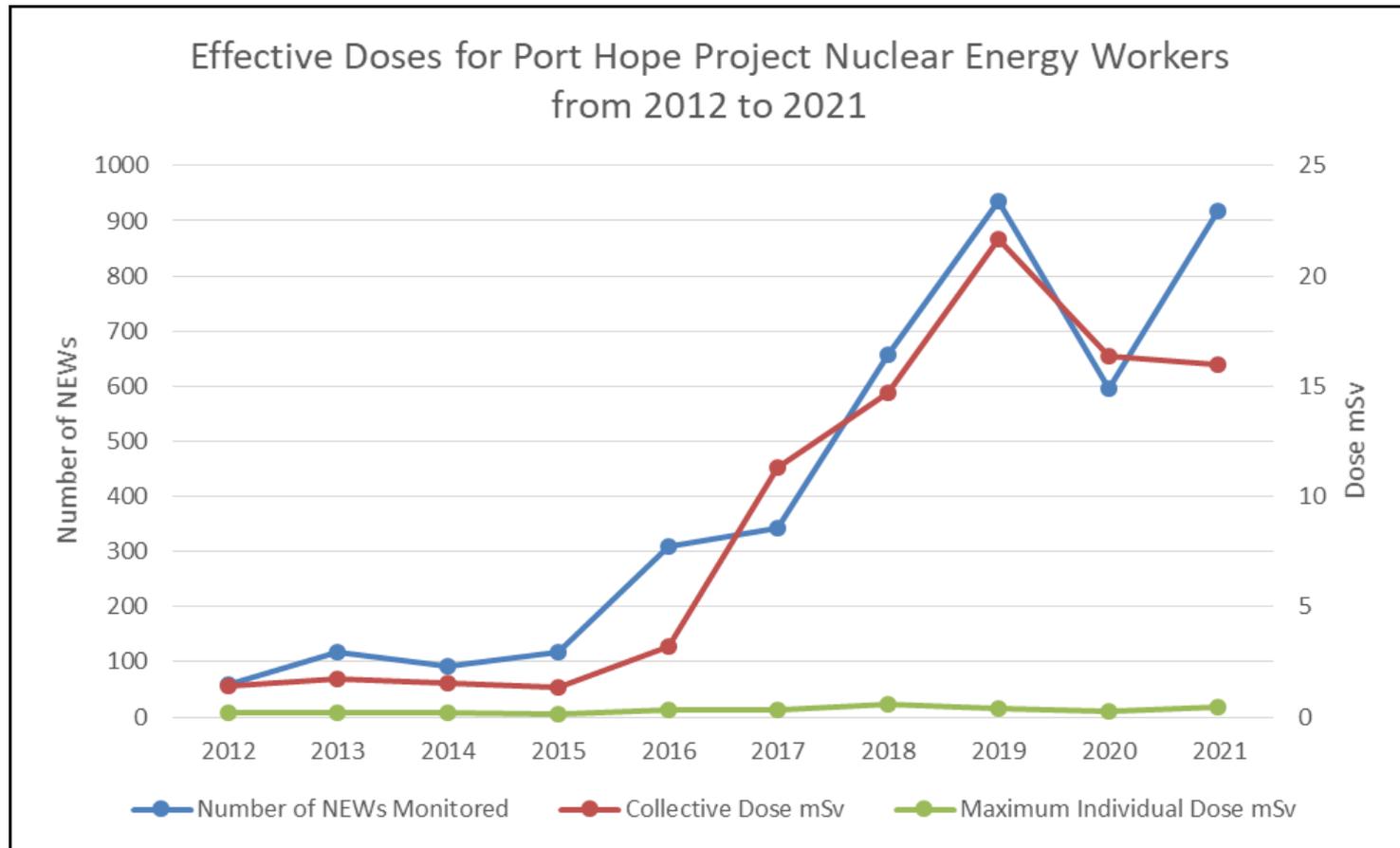
- **The most complex site of the PHAI. The site was designated an Area of Concern (AOC) in 1987 under the Canada-U.S. Great Lakes Water Quality Agreement and remains as an AOC today.**
- **Remediation: involves removing contaminated sediment down to bedrock or hard till; removing and replacing the deteriorated harbour walls; the removal of historic Low Level Radioactive Waste (LLRW) and industrial waste from the Center Pier.**
- **Restoration of the Harbour to a natural state.**

Cleaning Up the Harbour – and the Fish ?

- The PHAI cleanup of the Port Hope Harbour began in 2001, with mechanical dredging of the approach channel and the turning basin. The sediment is dewatered before being transported for storage at the Long-Term Waste Management Facility.
- Dredging activities are monitored for potential impacts and mitigation measures are put in place as needed.
- “De-fishing” of the inner harbour is underway (i.e., fish are removed from the area being worked on to another location just outside the area so the fish don’t get killed by dredging and other clean-up activities.)
- Previous electrofishing campaigns resulted in over 6,000 fish of varying species being safely removed and relocated to Lake Ontario outside the Inner harbour work area.

Radiation Exposure to Nuclear Energy Workers

PHAI Radiation Protection Plan



Cumulative Effects - Chemicals of Potential Concern (COPC)

- **COPCs: Notable absence of consideration by both the CNSC and CNL of the cumulative effects of COPCs to the environment, the lake, and to human health and the workers at the facilities.**
 - **Individual limits for specific COPCs and radioisotopes does not allow for consideration of the effects of cumulative effects of exposure to numerous substances over time, or to the variability in individual responses to such substances.**
 - **Under no circumstances, should the term (harmless) be used in reference to such substances.**

CONCLUDING REMARKS

- Safely containing waste be contained in perpetuity.
 - The reality is that “clean-up” really means removing contaminated materials from one site to another to store the stuff indefinitely, which in itself, may be impossible.
- CNSC’s proposal to require CNL to implement and maintain a waste management program and to maintain a decommissioning plan is essential and supported. It is also essential that a robust and public monitoring program in place.

CONCLUDING REMARKS (cont'd)

- Radioactive and other toxic wastes originating from the early 1930's have resulted in such a level of contamination that the Port Hope Harbour has been declared an Area of Concern (AOC) in the Great Lakes.
- In that the AOC is planned to be removed in 2025, what protection, testing, etc., is being planned to ensure the safety of the harbour, the people in the area, and the fish?

This has yet to be determined!