

Port Hope Project 2015 Annual Compliance Report Summary

The purpose of this report is to submit to the Canadian Nuclear Safety Commission (CNSC) the annual compliance report for the Port Hope Project (PHP) for the period 2015 January 1 to 2015 December 31. This report is issued in compliance with Section 2.3 of the *Port Hope Long-Term Low-Level Radioactive Waste Management Waste Nuclear Substance Licence* and Section 3.2.3 (e) of the *Port Hope Licence Conditions Handbook*.

- The Port Hope Area Initiative (PHAI) is a community-based project to develop and implement a safe, local, long-term management solution for historic low-level radioactive waste (LLRW) in the Port Hope area. The PHAI is defined by *An Agreement for the Cleanup and Long-Term Safe Management of Low-Level Radioactive Waste Situated in The Town of Port Hope, The Township of Hope and the Municipality of Clarington* (the "Legal Agreement"), which took effect on 2001 March 29, between the Government of Canada and the municipalities of Port Hope and Clarington for the management of the LLRW within each of the communities. Canadian Nuclear Laboratories (CNL) is responsible for the direction and execution of the PHAI in compliance with the Legal Agreement, licences and Environmental Assessment (EA) decisions. CNL has overall responsibility for managing the PHAI on behalf of Atomic Energy of Canada Limited, a federal Crown corporation.

The overall performance highlights for 2015 activities are outlined below.

- Port Hope Project-related activities:
 - The waste water treatment plant (WWTP) progressed through construction, inactive commissioning of Zone 1 and training activities for CNL Operations staff. The reverse osmosis units were registered with provincial regulators Technical Safety & Standards Authority (TSSA). Zone 1 was operated by CNL staff in a closed loop using clean water to gain operational experience and identify process deficiencies. Zone 2 (evaporators and slurry dryers) installation remains incomplete. The evaporators did not meet performance specifications, and the contractor had to replace the blowers. Work is in progress for commissioning the new blowers. Active commissioning of the Port Hope WWTP is expected to take place in 2016.
 - Early Works 3a (EW3a) commenced with mobilization of the contractor in 2015 September. The EW3a project involved the removal of contaminated soil in the footprint of Cell 1 and within the areas of the support buildings (former Early Works 2). The scope of work was modified to include the backfilling and extension of the existing long-term waste management facility (LTWMF) access road across Baulch Road to the Welcome Waste Management Facility (WWMF)

fence line. Removal of contaminated soil was 70 per cent complete by the end of 2015, with completion expected by 2016 March.

- Fieldwork for Campaign 2 (approximately 800 properties) of the Property Radiological Survey began in 2015 October and is expected to be completed in 2017 January. Work includes interior and exterior gamma scans and borehole drilling/soil sampling.
- Survey and delineation work at approximately 175 road allowances began in 2015 fall.
- All licensed activities continued to be carried out safely and securely.
- There were no failures of equipment, component process systems or inappropriate procedure of human action.
- CNL completed all required reporting as outlined in the *Licence Conditions Handbook* under Section 3.2.3.
- The annual management system review was complete in 2015 June and resulted some of minor findings. The annual ISO 9001 Audit took place in 2015 September and resulted in no findings and identified no further opportunities for improvement. Five compliance program self-assessments were conducted in the 2014/2015 fiscal year.
- No processing of wastes at the Welcome WMF occurred during the reporting period.
- CNL managed operations at the Welcome WMF in accordance with the parameters of the CNSC licence.
- Radiation exposures are well below all regulatory dose limits. Within the reporting period, three methodologies were discussed and accepted by CNSC staff: calculations for worker dose, action levels for radon at the WWMF and public dose estimates.
- Sixteen compliance oversights were conducted for the Port Hope Project. No negative trends were observed. Recommendations for improvement raised from compliance oversight activities were dispositioned or rectified prior to the next oversight inspection.
- There were no lost time injuries.
- EA follow-up and operational monitoring continued in 2015 with no areas of concern.
 - Operational Monitoring
 - Groundwater Monitoring
 - Thirteen on-site observation wells were sampled in 2015 May and 2015 December. Arsenic concentration level remains high in Observation Well 2-75 as compared to other wells, which is consistent with historical data. All other parameters were below Contaminants of Potential Concern (COPC) criteria.
 - Water Collection and Treatment System

- During the reporting period, none of the effluent discharge limits for the WWMF were exceeded and no toxicity failures occurred.
- Off-Site Sampling
 - Water samples were taken on a monthly basis from an off-site stream within the same watershed as the facility. Results are well below COPC criteria.
 - Domestic Wells
 - CNL voluntarily sampled domestic wells on 16 residential properties near the WWMF. The analyses for all domestic wells showed that the Ontario Drinking Water Quality Standards for the analyzed parameters were met, except at one well that exceeded the standard for nitrate. The source of the elevated nitrate is assumed to be the fertilizers used in the farm fields in the area surrounding the well. All residents have been notified in writing about their well monitoring results. No further action required.
- Port Hope Project Environmental Assessment Monitoring consists of atmospheric, geology and groundwater and aquatic monitoring. Below is a brief summary of each environment's monitoring for 2015.
 - Atmospheric Monitoring
 - Air quality monitoring resumed in 2015 September to coincide with the start of EW3a construction activities. The monitoring results were comparable to previous years, indicating that construction activities have not affected air quality outside of the CNL-controlled area.
 - Independent Dust Monitoring
 - During the EW3a project, there were 10 occurrences when the 15-minute average exceeded the administrative control levels, but did not exceed the 24-hour overriding limit of 120 $\mu\text{g}/\text{m}^3$. Of these, eight occurred in the same day when excavation work was underway in very close proximity to the sampler. The other two exceedances were reported on a different day, and the causal factor remained the same. During these events, and throughout the project, dust levels were being controlled on the site as there were no exceedances of the overriding limit from the high-volume air samplers located at the perimeter of the controlled area.
 - Noise Monitoring
 - Based on the results of four monitoring campaigns, three prior to EW3a and one during, the noise impact associated with EW3a was localized and would not have been a nuisance effect for most of the residents living in

areas adjacent to the site. CNL did not receive any noise complaints with respect to EW3a project activities.

▪ **Geology and Groundwater Monitoring**

- Groundwater samples were collected and analysed for contaminants twice in 2015 at 20 monitoring wells located within the WWMF. Some wells have a concentration for arsenic and uranium that are above the established groundwater quality criteria from the *Environmental Monitoring Plan Port Hope Project*. The exceedances are the result of the effects of the current waste management facility, which does not have an engineered liner or cover system in place. Monitoring will continue through the phases of the project, and improvements to groundwater quality are expected to be occurring through natural attenuation. The average water levels in monitoring wells are comparable to previous years, as expected. As such, it can be assumed that groundwater flows have not changed as expected in the early phases of the LTWMF construction. No groundwater monitoring wells from the EA monitoring program were decommissioned during this reporting period.
- Soil monitoring results indicated that there were no exceedances of COPCs in 2015.

▪ **Aquatic Monitoring**

- The water quality in all locations of the Brand Creek watershed has remained stable over the last few years, notably with respect to metals and radionuclides. This result was expected as construction activities have been limited. One storm event was sampled hourly in 2015. Overall, the contaminant concentration decreased slightly through the sampling event as seen by the concentration of total suspended solids. The concentrations of the main COPCs were slightly elevated throughout the storm event, but there were no exceedances.
 - The Lake Ontario water quality at the diffuser is slightly affected by the current WWMF operations, but recovers to background levels at a distance of 20 metres (m), which is outside the mixing zone. The mixing zone is approximately 12 m around the diffuser. There were no noted increase as a result of EW3a activities.
 - The leachate from the WWMF mound (called drainage water) collected in the treatment ponds was sampled twice in 2015, in June and November at the start of EW3a work. The water quality has remained stable over the past few years.
- In 2015, there were no emergency events that directly or indirectly affected the Port Hope Project.
 - The waste management Safety Control Area is not applicable to the Port Hope Project.

- There were no security events that effected the Port Hope Project. The Threat and Risk Assessment for the Welcome Waste Management Facility (WWMF) was updated.
- The safeguards and non-proliferation Safety Control Area is not applicable to the Port Hope Project.
- From 2015 January to 2015 December, there were no radioactive material transport shipments associated with the Port Hope Project.
- CNL maintained effective relationships with the local community and First Nations through its many outreach and stakeholder relations activities, in accordance with the PHAI Public Information Program.