

Port Granby 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 Granby Project (PGP)-related activities:
 - Completed Culvert #3 design, procurement of contractor and construction.
 - Completed road safety upgrades on municipal roads, including asphalt repairs and erosion work on Elliott Road.
 - Completed 2015 Biannual Municipal Road Condition Safety Assessment.
 - Presented PGP emergency awareness video to Municipality of Clarington First Responders.
 - Completed site preparation activities including geotechnical and well inspections, location of underground utilities and buried services, application for a Load Restriction permit, topsoil sampling and other utility locates for subsurface utility engineering.
 - Completed contractor selection process for Port Granby Long-Term Waste Management Facility (PG LTWMF) and awarded contract to AMEC CB&I Joint Venture.
 - Received, reviewed and accepted contractor's preliminary construction submittals, including detailed construction progress schedule and cost

breakdown, as well as plans related to early site-work, health and safety, construction quality control, spill prevention and contingency, environmental protection and construction traffic management.

- Began preparation of Port Granby Long-Term Waste Management Facility (PG LTWMF) site, including grading and receipt of granular materials.
 - Issued PG LTWMF and Port Granby Waste Management Facility (PGWMF) remediation design consultant contract to AECOM.
 - Following field testing of two sources for clay liner material, including test pads, selected one source in Bowmanville, Ontario, to supply this material.
 - Submitted revised design of the Lakeshore Road underpass layout to stakeholders, CNL and Municipality of Clarington, for review and approval.
- All licensed activities continued to be carried out safely and securely.
 - There was one failure of equipment component process systems/inappropriate procedure of human action at the PGWMF, which was reportable to CNSC. A small hydrochloric acid leak occurred in 2015 November due to acid corrosion damage on a replacement fitting installed the previous day by a contractor. There was no off-site release to the environment, nor was there any impact to the workers or the public. This was reported to CNSC staff as per S. 29(1) of the *General Nuclear Safety Control and Regulations* (SOR/2000202) and followed up with the submission of the detailed report on 2015 November 25.
 - 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 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 PGWMF or PG LTWMF occurred during the reporting period.
 - Through 2015, CNL continued to manage operations at the PGWMF and Port Granby Waste Water Treatment Plant (PG WWTP) in accordance with the WNSL. The existing PGWMF was maintained in good order.
 - CNL assumed operation of the new PG WWTP in late 2014. No contaminated water was introduced to the PG WWTP in 2015; however, CNL did operate the plant with clean water in a closed loop.
 - Three compliance oversights were conducted for the operation of the new PG WWTP. The operation of the new PG WWTP was found to be in compliance with PHAI and company-wide procedures, with some minor recommendations for improvement. Compliance oversight of the PG LTWMF contractor will commence in 2016.

- Radiation exposures were well below all regulatory dose limits, average collective dose for the PHAI was 1.37 mSv for 2015. Within the reporting period, three methodologies were discussed with and accepted by CNSC staff: calculations for worker dose, action levels for radon at the PGWMF and public dose estimates.
- There were no lost time injuries.
- EA follow-up and operational monitoring continued in 2015 with no areas of concern.
 - Operational Monitoring
 - Groundwater Monitoring
 - Twelve operational monitoring wells on the existing PGWMF were sampled in 2015 May. In observation well 206S, elevated concentrations of the contaminants, uranium, fluoride, nitrate and ammonia, were noted. These values are a result of the pre-existing condition at the PGWMF. The existing facility does not have an engineered liner or cover system in place with the wastes. These levels are expected to decline through natural attenuation after remediation.
 - Bluff Seepage Monitoring
 - In 2015, seepage samples were collected quarterly from three locations along the Lake Ontario bluffs between the east and west gorges in the areas where active erosion is being monitored. Elevated concentrations of arsenic, uranium and radium-226 were noted in the seepage water. The elevated concentrations are in line with historic trends for bluff seepage monitoring. However, seepage flow volumes are very small throughout most of the year. As a result, the total contaminant plume to Lake Ontario remains very small. The seepage water quality is expected to improve as the project evolves.
 - Water Collection and Treatment System
 - During the reporting period, none of the effluent discharge limits for the PGWMF were exceeded. No toxicity failures occurred during the reporting period.
 - Geotechnical Monitoring Program
 - The geotechnical inspections in 2015 were performed by a consultant in April, May and December. No remedial action is required. It was suggested by Golder Associates that monitoring of erosion and ground surface movements and updating of stability analyses be continued on an as-required basis and that CNL should continue routine visual inspections every one to two months and/or immediately after periods of heavy rainfall or stormy weather.

- Port Granby Project Environmental Assessment Monitoring consists of atmospheric, geology and groundwater and aquatic monitoring. Below is a brief summary of environmental monitoring for 2015.
 - Atmospheric Monitoring
 - There were no exceedances in TSP 24-hour averages at any Port Granby monitoring location of the PHAI overriding limit of 120 µg/m³ for a 24-hour period at the CNL-controlled area perimeter.
 - Independent Dust Monitoring
 - During the 2015 reporting period, there were no construction activities that required independent dust monitoring to take place.
 - Noise Monitoring
 - There was no outdoor construction work underway at the time of monitoring; as such, this monitoring program can be used as a supplement to previously collected data for establishing the baseline. Noise levels in 2015 were somewhat consistent with 2014 results with some monitoring locations experiencing a slight diminution in noise.
 - Geology and Groundwater Monitoring
 - Groundwater samples were collected and analysed for contaminants quarterly at 20 monitoring wells located within the PGWWMF and PG LTWWMF. On the site of the current PGWWMF, the groundwater quality is expected to improve significantly once waste removal is completed. On the site of the PG LTWWMF, changes to groundwater quality are expected to be minimal due to the presence of an engineered containment system made from a multi-layered baseliner and cover system and leachate water collection system. Perimeter monitoring will be used at the site perimeter locations to confirm effectiveness of the containment system.
 - Soil sample results indicated that only total boron has consistently exceeded the clean-up criteria for the Contaminants of Potential Concern (COPCs) at all locations. However, it should be noted that the value is not increasing, indicating that the condition was pre-existing and that the project is not contributing to these elevated levels. All other values are below the clean-up criteria for the COPCs and are comparable to previous years.
 - Aquatic Monitoring
 - Results from sediment sampling indicated there were no exceedances against the *Provincial Sediment Quality Guidelines*. The concentration of contaminants in the sediments has remained fairly stable over the past three years. It is expected to improve once remediation of the Port Granby site is complete.

- The surface water flowing in the Port Granby Creek watershed was sampled on a quarterly basis at two locations. Water quality in the sample locations of the stream have remained stable over the last few years, notably with respect to metals and radionuclides. This result was expected as there were limited construction activities in 2015. There were no exceedances against the *Ontario Provincial Water Quality Objectives* (PWQO). Port Granby Creek was also monitored for one storm event in 2015. There were exceedances of lead against the PWQO in a few samples collected as the Port Granby Creek flow was increasing throughout the storm event. This increase is proportional to the increase in total suspended solids. There were no construction activities that could have an impact on water quality surrounding the facility occurring during the sampling. As such, no further actions have been taken.
- The Lake Ontario water quality at the diffuser is not affected by the current PGWMF operations, and this is also evident from results of the mixing zone samples.
- The results of the drainage water sampling campaigns were compared against the PWQO and the *Canadian Water Quality Guidelines for Protection of Aquatic Life* (CWQG). There were several exceedances, notably hardness, phosphorous and iron. Emplacement of waste has not yet begun at the PG LTWMF; as such, these exceedances are not related to the operation of the facility. Rather, the rural nature of the site and the associated farming activities would likely contribute to the higher-than-normal phosphorous levels in the ponds, located east of the PG WWTP.
- The waste management Safety Control Area is not applicable to the PGP.
- There was one security event related to the PGP that was reportable to CNSC under Section 29 (1) (e) of the *General Nuclear Safety and Control Regulations*. The north fence line was discovered to be cut at the PGWMF, north of the onsite transformer station by CNL. After further investigation of the critical areas in and around the onsite water treatment building, including camera footage, no items were noted missing and it did not appear that the trespasser was in the area of the water treatment building or back-up generator. The fence line breach was repaired the morning of the discovery. There was no loss of assets or increased security risk to the PGWMF or PG LTWMF. The Threat and Risk Assessment for Port Granby was updated in 2015.
- The safeguards and non-proliferation Safety Control Area are not applicable to the PGP.
- From 2015 January to December, there were no radioactive material transport shipments associated with the PGP.
- CNL maintained effective relationships with the local community and First Nations through its many outreach and stakeholder relations activities, in accordance with the PHAI Phase 2 Communications Plan.

