

## **Remediation of legacy low-level radioactive waste: Regulatory oversight for two major remediation projects in Canada**

*Tuesday, 24 May 2016 11:45 (15 minutes)*

This paper provides a summary of the Canadian Nuclear Safety Commission's (CNSC) regulatory oversight process for licensing two environmental remediation projects of legacy radioactive waste in Canada. The CNSC, which reports to Parliament through the Minister of Natural Resources, is the sole regulatory authority for the peaceful use of nuclear energy in Canada. As Canada's nuclear regulator, the CNSC is responsible for licensing of all aspects of uranium mining, including remediation activities at legacy sites. Staff of the CNSC has a great deal of experience in reviewing documentation in support of a licence application. Licence applications are reviewed by CNSC staff, whose role, in general, is to provide authoritative and defensible advice and recommendations to the Commission. Although the licensing process for legacy sites is no different than for any other CNSC license, assuring regulatory compliance requires the addition of unique elements such as site characterization of an existing site, clean-up criteria, community concerns, historic records and long-term management. These are some of the challenges presented in the remediation of historic waste, and hence the regulation of such sites.

The purpose of the regulatory review of a licensing document is to confirm that sufficient information is provided to justify claims that regulatory requirements have been or will be met. In doing so, the regulatory review may need to corroborate claims of safety, performance or environmental protection made in the submission. The advice and recommendations of CNSC staff to the Commission regarding a licensing decision arise from staff's critical review of applications and licensees' submissions, activities and actions. After a licence has been issued for the remediation of a contaminated site, there is often a need to review additional documentation that validate compliance with a regulation or licence conditions.

This paper presents CNSC staff's current regulatory review process using two examples of active Canadian nuclear legacy site remediation projects. The first project, known as the Port Hope Area Initiative or PHAI ([www.phai.ca](http://www.phai.ca)) involves the federal clean-up of historic low-level radioactive waste situated in the municipalities of Port Hope and Port Granby in Ontario, Canada. The Government of Canada has invested over \$1.28 billion (Cdn. dollars) to construct two new long term waste management facilities designed to accommodate approximately 1.65 million cubic meters of legacy contaminated wastes. PHAI is licensed under two 10-year CNSC Waste Nuclear Substance Licences issued by the Commission in 2011 and 2012.

The second project is the remediation of the Gunnar mine and mill site located in northern Saskatchewan. The Gunnar mine and mill was operated by the former Gunnar Mining Limited from 1955 to 1963 and was decommissioned in 1964. At decommissioning, the open pit and underground workings were flooded, and the mine shaft and openings were plugged with concrete. The buildings at the site were demolished in 2010. The tailings, waste rock, and other mine waste were left behind and remain on the surface to this day. This remediation project is also licensed under a 10-year CNSC Waste Nuclear Substance Licence.

Large remediation projects such as those discussed in this paper require the conduct of an environmental assessment prior to a licensing decision. The proponent is then required to submit licensing documentation to support a licensing review process under the Nuclear Safety and Control Act (NSCA) that, if successful, would lead to the issuance of a licence to authorize the remediation work. These legal requirements rely on the submission of documentation that is reviewed by CNSC staff and presented to the Commission for consideration. If the remediation project is approved, then verification activities are conducted by CNSC staff to ensure that the project proceeds as planned and that all measures related to safety and to public engagement are appropriately implemented.

Key aspects in CNSC staff's current regulatory oversight are highlighted such as the assessment of data, consideration of limitations and supplications, long-term monitoring, community concerns and environmental objectives for contaminated sites.

This document shares the experiences of the Canadian nuclear regulator's regulatory review process to evaluate remediation projects and is intended to encourage discussion about the regulation of remediation projects and to help those with less experience in licensing remediation projects.

## **Country or International Organization**

Canadian Nuclear Safety Commission

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**Session Classification:** Session 2 - 2

**Track Classification:** Regulatory framework and standards for decommissioning and environmental remediation