Beneficial Use of an Abandoned Slip for Confined Space Disposal of Contaminated Sediment

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Background/Objectives. A sediment rehabilitation program was designed and implemented to address environmental risk within the sediments of the Anse du Moulin (ADM) located in Baie-Comeau, Québec, on the north shore of the St. Lawrence River's Lower Estuary. The sediment rehabilitation program was performed to address polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) in sediment within the ADM. This portion of the St. Lawrence Seaway is subject to extreme wave events during storm conditions. In addition, the remediation project needed to be implemented concurrently while maintaining active operation of the adjacent facility and wharf.

Approach/Activities. Environmental investigations and ecological and human health risk assessments were undertaken to evaluate the nature, extent, and potential risks to human health and the environment within the ADM. An alternatives analysis was then performed to evaluate rehabilitation alternatives to address the contaminated sediment and achieve established remedial action objectives. The alternatives analysis was developed in coordination with federal and provincial government agencies and public consultation to evaluate the effectiveness and estimated costs for potential remedial alternatives and allow for beneficial use of an abandoned berthing slip with deteriorated wharf walls. After the preferred remedy was selected, the remedial design was developed in less than 10 months to enable permitting and construction within the project's aggressive schedule.

The preferred remedy included the following components:

- A 17-meter tall, stone/gravel/sand containment berm was constructed near the mouth of a slip between two existing wharves to serve as a confined disposal facility (CDF).
- Approximately 55,000 cubic meters of contaminated sediment was mechanically dredged from navigable portions of the ADM and transported/offloaded into the CDF for final disposal.
- Water generated during the dredging and dredged material handling operations was treated prior to discharge back to the embayment.
- Dredged areas were backfilled with 15 to 30 centimeters of clean sand.
- A multi-layer, in-water armored sediment cap was constructed over existing sediment in non-dredged portions of the ADM to isolate and prevent migration of subsurface sediment.
- A multi-layer cap was constructed to provide a barrier over dredged material placed in the CDF and to match the surface elevation of the adjacent wharf. This space will become usable space for facility operations.

Results/Lessons Learned. The marine construction work was successfully completed on schedule between March and November 2017 while the facility's wharf operations continued uninterrupted. The constructed CDF will allow future use of the newly created land within the abandoned berthing slip that can be used for facility operations.