



A truck is decontaminated at the Port Hope Project long-term waste management facility after depositing waste in the facility's baseliner storage cell.

Cleaning Up in Canada

On the shores of Lake Ontario, Canadian Nuclear Laboratories is tackling one of the country's largest environmental remediation projects.

The \$1.28 billion cleanup of legacy low-level radioactive waste in the Ontario communities of Port Hope and Clarington is well underway.

The cleanup project, called the Port Hope Area Initiative (PHAI), is based on a legal agreement between the government of Canada and the adjacent municipalities of Port Hope and Clarington, along the northern shore of Lake Ontario. It comprises two separate projects for the long-term management of waste located in each of these municipalities. The waste is the result of past radium and uranium processing by the former crown corporation Eldorado Nuclear Limited and its predecessor companies, during the period between 1932 and 1988. Canadian Nuclear Laboratories (CNL) is implementing these projects on behalf of Atomic Energy of Canada Limited, a Canadian crown corporation.

In Port Hope, history was made this summer when the first load of low-level radioactive waste was safely removed from the Centre Pier on Port Hope's waterfront and placed into long-term

storage at an engineered facility being built as part of the project. This means that the cleanup in the community of Port Hope has begun, following years of public consultation and planning. Removal of the waste from the Centre Pier and other temporary storage sites is being completed by Amec Foster Wheeler at an approximate cost of Can\$2.6 million (about \$2 million).

Once the waste has been removed from the temporary storage site, the Centre Pier will be used as a future staging area for the remediation of Port Hope's harbor. This work will include the rehabilitation of the harbor walls, installation of a wave attenuator and silt curtain to isolate the harbor, and dredging of more than 120,000 cubic meters (156,954 cubic yards) of contaminated sediment. The contract to complete this work, starting later this summer, has been awarded to Milestone Engineering & Construction for approximately Can\$90 million (about \$69 million).

At the same time, radiological testing of almost 5,000 Port Hope properties is ongoing to identify the presence or absence of



Construction of the baseliner cells of the Port Hope Project engineered waste storage facility began last year. The baseliner is a multilayered system used to isolate the waste from the environment. Materials such as clay, geosynthetic liner, and aggregate are sourced from regional suppliers.

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Low-level radioactive waste previously stored under tarps is excavated from Port Hope's Centre Pier and loaded into trucks for transportation to the new long-term waste management facility in Port Hope.



Dust monitoring is ongoing whenever PHAI construction is underway. The PHAI dust management plan sets out limits and action levels to ensure that dust is controlled and mitigated on-site for the protection of people and the environment.

low-level waste at homes and businesses within the community. To date, CNL has identified more than 800 properties that will require some amount of remediation. The cleanup of the first residential properties is scheduled to start later this summer.

As part of the cleanup of these residences, CNL will remove the waste and restore these properties at no cost to the owner. Each property involved in the program will be cleaned up to stringent criteria and verified through testing and monitoring. Once the property has been confirmed clean, the owner will receive a compliance letter from CNL. Property testing and remediation will continue until 2024.

All waste excavated through the PHAI is safely transported along designated haul routes to a new long-term waste management facility under construction at a site located north of urban Port Hope. Approximately 1.2 million m³ (1.57 million yd³) of waste will be excavated from various sites within the community and stored and monitored at the engineered facility for hundreds of years.

Scott Parnell, CNL's general manager of Historic Waste Programs, stated that CNL is taking every measure to ensure that the waste is safely managed as it arrives at the facility.

"Continuous oversight and monitoring is critical to making sure that this project is done safely," Parnell said. "By taking a cautious, planned approach to our work, we are continually raising the bar and creating the safest work environment possible for our people, while meeting all regulatory requirements."

Meanwhile, in the Port Granby area of Clarington, more than half of the low-level waste has already been excavated from a legacy waste site on the shoreline of Lake Ontario. All of the waste is being transported almost 1 kilometer (0.62 miles) north of Lake Ontario to a separate long-term waste management facility, currently under construction. This work is being completed by a joint venture of Amec Foster Wheeler and CB&I and will cost approximately Can\$300 million (about \$230 million) to complete.

Before waste movement in Port Granby began in 2016, it was estimated that 450,000 m³ (588,578 yd³) of waste would need to be removed from the legacy site. After more than a year of digging, more waste than anticipated is being discovered and

An articulated rock truck carries radioactive waste to the cells of the engineered facility in Port Granby, part of Clarington, Ontario.

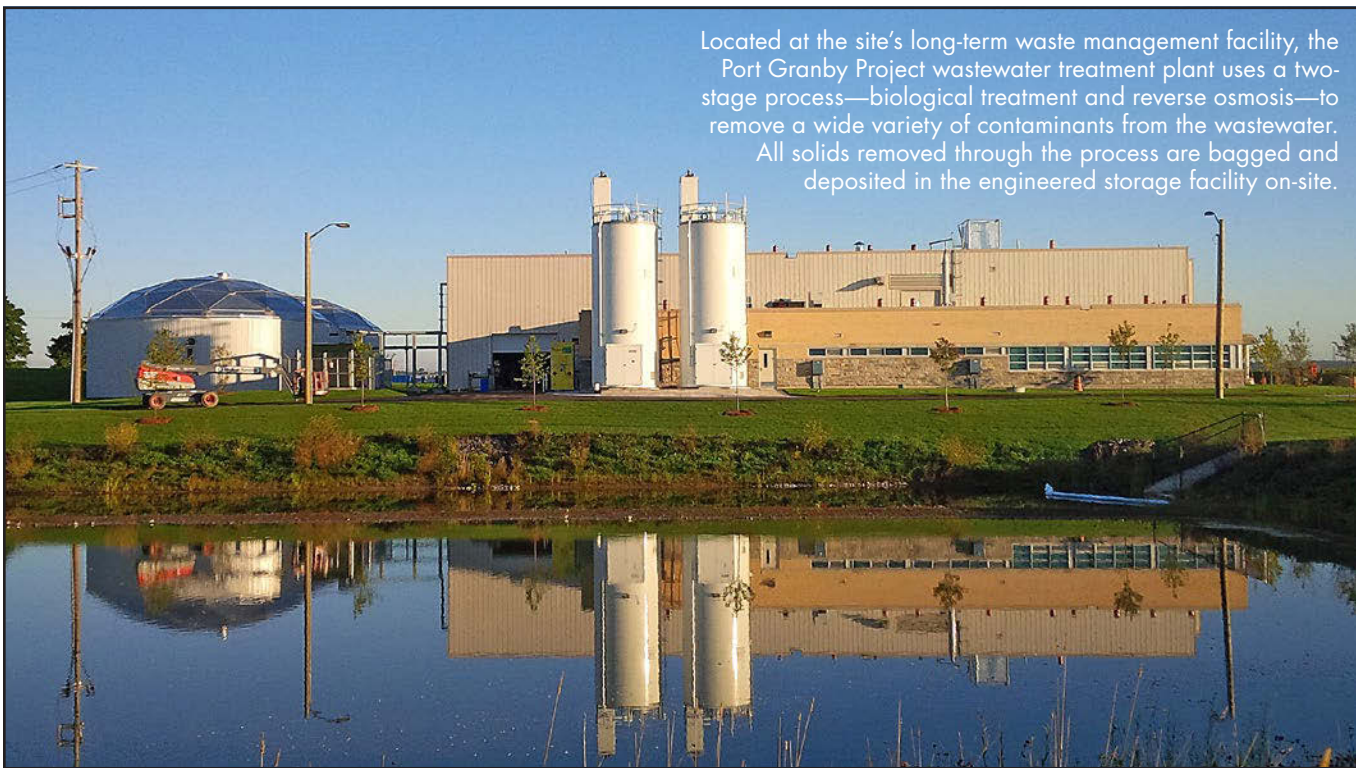


As part of the ongoing radiological investigations, borehole drilling is done at Port Hope private properties to determine the presence or absence of legacy low-level waste at residences and businesses located in town.

Waste excavation is conducted at the legacy waste site on the shoreline of Lake Ontario in Port Granby.



Located at the site's long-term waste management facility, the Port Granby Project wastewater treatment plant uses a two-stage process—biological treatment and reverse osmosis—to remove a wide variety of contaminants from the wastewater. All solids removed through the process are bagged and deposited in the engineered storage facility on-site.



removed. This increase in total waste will not impact the long-term facility, which is designed with contingency space.

CNL has said that protection of the surrounding environment is one of its top priorities. To that end, advanced technology wastewater treatment plants have been commissioned for each project to remove a wide range of contaminants from groundwater, surface water, and leachate collected during the construction and remediation phase of the PHAI. According to CNL, each treatment process has been designed to ensure that the quality of treated water being discharged into Lake Ontario meets stringent regulatory requirements, resulting in enhanced protection

of the Great Lakes basin ecosystem.

As one of Canada's largest environmental remediation projects, the PHAI is a complex undertaking, with appropriate regulatory approvals in place. Ongoing communications with the two communities have resulted in a well-informed public that is eager to realize Canada's commitment to the cleanup of legacy waste in the communities, which will leave an honorable legacy for future generations. ■

Article and photos appear courtesy of Canadian Nuclear Laboratories.