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Where is AECL's Radioactive Waste Going?

AECL and Canadian Nuclear Laboratories (CNL) have completed the emplacement of low-level radioactive waste at the Port Granby site of the Port Hope Area Initiative (PHAI) and continue work at the Port Hope facility. CNL is proposing to build a Near Surface Disposal Facility (NSDF) at the Chalk River Laboratories, a safe, long-term solution for AECL's low-level radioactive waste.

Until these projects are finalized, radioactive waste is safely managed at interim/long-term storage facilities at AECL sites. Monitoring these facilities is an important part of CNL's extensive monitoring programs at each of AECL's facility in Canada. These programs include regular sampling of land, water, wildlife and air. The results of this monitoring are reported to the public annually.

Classification of Radioactive Waste

LLW – Low-Level Radioactive Waste: needs minimal shielding to handle, such as building materials and debris, soil, protective clothing.

ILW – Intermediate-Level Radioactive Waste: for example, waste generated in hot cells from the production of medical isotopes.

HLW – High-Level Radioactive Waste: nuclear fuel waste.

The Port Granby Long-term Waste Management Facility

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Low-level and Intermediate-level Waste

NSDF – Near Surface Disposal Facility, proposed facility at the Chalk River Laboratories for low-level radioactive waste.
WR-1 – reactor in-situ decommissioning – research reactor at Whiteshell, Manitoba.
NPD – reactor in-situ decommissioning – prototype reactor near Rolphton, Ontario.
Port Hope LTWMF – Waste Management Facility, part of the Port Hope Area Initiative (work ongoing).
Port Granby LTWMF – Long-term Waste Management Facility, part of the Port Hope Area Initiative (work complete).

High-level Waste

It is expected that the 275 cubic metres of high-level waste owned by AECL will be emplaced in the Nuclear Waste Management Organization's Deep Geological Repository by 2050.

Emplacement by 2022	Emplacement by 2030	Emplacement by 2050	Emplacement by 2100
Low-level waste			
982,000 m^3 at the Port Hope LTWMF	1,270,000 m^3 at the Port Hope LTWMF	1,270,000 m^3 at the Port Hope LTWMF	1,270,000 m^3 at the Port Hope LTWMF
802,800 m^3 at the Port Granby LTWMF	802,800 m^3 at the Port Granby LTWMF	802,800 m^3 at the Port Granby LTWMF	802,800 m^3 at the Port Granby LTWMF
–	497,546 m^3 at the NSDF	727,826 m^3 at the NSDF	876,935 m^3 at the NSDF
–	2,298 m^3 at the NPD waste disposal facility	2,298 m^3 at the NPD waste disposal facility	2,298 m^3 at the NPD waste disposal facility
–	2,141 m^3 at the WR-1 waste disposal facility	2,141 m^3 at the WR-1 waste disposal facility	2,141 m^3 at the WR-1 waste disposal facility
Intermediate-level waste			
–	107 m^3 at the WR-1 Waste Disposal Facility	107 m^3 at the WR-1 Waste Disposal Facility	107 m^3 at the WR-1 Waste Disposal Facility
–	389 m^3 at the NPD waste disposal facility	389 m^3 at the NPD waste disposal facility	389 m^3 at the NPD waste disposal facility
–	–	1,521 m^3 to be emplaced at a potential national facility, yet to be determined*	–
High-level waste (used fuel)			
–	–	275 m^3 at the NWMO DGR	275 m^3 at the NWMO DGR

* AECL's ILW is currently in interim storage facilities at the Whiteshell Laboratories and Chalk River Laboratories. At the request of the Minister of Natural Resources, the Nuclear Waste Management Organization is preparing an Integrated Strategy for Radioactive Waste, due to be presented in 2023. This is likely to impact the final disposition pathway for AECL's ILW (excluding that in the WR-1 and NPD reactors). In the meantime, AECL plans to consolidate its inventory of ILW at the Chalk River Laboratories in the coming years.

Note: The NSDF will contain waste from other AECL facilities as decommissioning continues and from ongoing operations at the Chalk River Laboratories. This means the amounts from 2030 forward include projected waste and will therefore be more than the total amount attributed to AECL to 2019.

For more detail, please consult The Inventory of Radioactive Waste in Canada 2019, published by Natural Resources Canada at: Inventory of Radioactive Waste in Canada 2019 (nrcan.gc.ca).