

Reprocessing and centralized waste storage / disposal

The nuclear industry refers to extracting plutonium or other specific isotopes from nuclear fuel waste as “reprocessing” or “recycling.” It is highly contaminating, practiced in only a few countries, and linked to nuclear proliferation and nuclear weapons.

There has never been commercial reprocessing in Canada. The limited reprocessing done at the federal government's Chalk River Nuclear Laboratory has left a legacy of nuclear contamination. Canada is currently reviewing its radioactive waste policy. The revised policy must include a formal prohibition on nuclear fuel waste reprocessing in Canada.

The Nuclear Waste Management Organization (NWMO), a consortium of nuclear power reactor operators, is currently seeking a location for a deep geological repository for all of Canada's high-level reactor waste.

Since 2005, the NWMO has carried forward the ‘option’ of shallow underground storage areas at their selected future site of a deep geological repository. Many observers have identified this option as being amenable to the short-term storage of fuel wastes centralized for reprocessing.

The NWMO produces a “watching brief” on reprocessing each year but the NWMO is largely silent on the potential to add a reprocessing operation to their facility. However, in their “adaptive” process, they have already proposed accepting additional and not-yet characterized wastes from small modular nuclear reactors.

Fundamental to the NWMO program is the centralization of all of Canada’s high level nuclear waste. The NWMO is proposing that Canada’s high level nuclear fuel waste be centralized in a single location where they will “repackage” the reactor waste in a series of hot cells, where the reactor waste is removed from its package and transferred to another container.

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Canadian Nuclear Laboratories is a private sector consortium that manages the Chalk River Nuclear Laboratory site, the only location in Canada where reprocessing has been carried out. CNL is currently constructing a fuel waste “research facility” that will include 12 hot cells.

Reprocessing does not reduce the need for radioactive waste storage or long-term management. After reprocessing, the remaining material will be in several different waste forms, and the total volume of nuclear waste will have been increased by a factor of 20 or [more](#).

Reprocessing [generates](#) new waste types, including low-level waste and plutonium-contaminated waste. [Studies](#) have shown that in addition to generating more and different types of radioactive waste, reprocessing waste costs more than other radioactive waste management and storage options.

Extensive processing of intensely radioactive spent fuel using volatile chemicals presents [more opportunities](#) for release of radionuclides than leaving spent fuel in thick metal or concrete casks.

Iodine-129, the key radionuclide in post-closure safety assessments for deep geological repository concepts, would be [unaffected](#) by reprocessing.

Centralizing waste for reprocessing creates an attractive target for terrorist acts.

No complete life-cycle study of the safety and terrorism risks of reprocessing and recycling compared to those of direct disposal [has yet been done](#) by disinterested parties.

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