Natural Resources Canada Review of Canada's Radioactive Waste Policy

Responses and Comments to the Discussion Papers provided by NRCan

[redacted] May 29, 2021

General Comments and suggestions on **Principles** for a Canadian Radioactive Waste Policy – (must include but not necessarily be limited to the following:

1. Must follow the principles of UNDRIP, in particular the Free, Prior and Informed Consent clause;

2. Independence: a body independent of the nuclear industry must oversee radioactive waste policy, the reality and perception of conflict of interest in CNSC and Natural Resources Canada as both promoter and regulator of the industry must be ended;

3. Environmental Justice: disproportionate impacts on marginalized and racialized populations (including Indigenous) must be accounted for;

4. Avoid burden on future generations: This means we do not continue to add to stockpiles of radioactive waste, no In-situ decommissioning and no abandonment of radioactive waste;

5. Protection of human health and the environment: Must speak explicitly to this, Health Canada and Environment and Climate Change Canada must have regulatory authority; Waste facilities should not be close to major water bodies;

6. Polluter pay principle: the costs for management of nuclear waste must be built in to the front end financing of nuclear infrastructure development;

7. No importation of nuclear waste from other countries;

8. Transparency: open to all Canadians. Full and accessible public disclosure of all information is critical, including information on "clearance" levels and end-products in the open market that contain radioactive components and contamination.

Minimization of waste:

The "Waste Hierarchy", as described, is not appropriate for radioactive waste. The first goal must be waste avoidance, in other words, phase out of further waste production – to be clear, the principle of waste minimization is incompatible with the continued use of nuclear power.

The word "recycling" is not appropriate and should be excluded from consideration in a radioactive waste policy. "Recycling" of nuclear waste adds to waste as opposed to minimizing it – for example, the reprocessing of high level waste creates highly radioactive liquids which are challenging to contain. Canada's radioactive waste policy must strictly forbid plutonium extraction and the current prohibition on reprocessing of spent fuel must continue. In addition, when low level radioactive materials are "cleared" and added to metal scrap for recycling, or to other consumer and industrial products, the resulting product is radioactively contaminated. Radioactive waste, even at the lowest levels must remain traceable, and "free release" must be discontinued.

The concept of waste "reduction" should not be interpreted to mean that it moves out of regulatory control of the CNSC.

Waste Disposal:

The terminology of "disposal" is problematic in the context of radioactive waste. Disposal means "the act of getting rid of something, especially by throwing it away", and further, according to the discussion paper "…without the intention of retrieval". The concept must be replaced by an approach of long-term management, given the long-lived nature of radionuclides. This approach would include measures for monitoring, retrieval, remediation and security, together with clear policies for communications with communities nearby and downstream of any waste facilities.

In-situ "disposal/entombment/decommissioning" must not be a disposal option for legacy reactors. For the WR-1 reactor, the in-situ proposal constitutes a near-surface disposal facility. The site was never conceived of as a nuclear waste disposal site, and it is located immediately adjacent to the Winnipeg River. Even the IAEA explicitly rejects in-situ decommissioning/disposal except in very rare circumstance of catastrophic accidents (eg. Chernobyl).

Principles required for radioactive waste management:

An independent agency that is arms-length from government and industry should be established for the management of radioactive wastes;

Independent scientific, technical and social advisory groups should be established to support the independent agency;

A regulatory body which licenses nuclear facilities should report to Parliament through Environment Canada;

Waste management should be funded by the waste owners and generators, but how the funds are used should be directed by the independent agency;

Indigenous peoples and the public should be engaged in policy and project development and review, with funded access to legal and technical advisors and all relevant documentation.

Clarity of terminology is essential, for example: "consent", "willing host".

For any waste management site, be it uranium mine tailings, processing facilities, nuclear power plants or high level waste facilities, a detailed inventory of radioactive components must be available to the public.

There must be NO importation of radioactive waste for "disposal" or "management" in Canada.

Radioactive Waste Storage

As with all the NRCan discussion papers, important issues are missing or glossed over. The Storage paper implies that radioactive wastes in Canada are currently being safely stored, however, we know that there are plumes of radioactive contamination in soils from storage areas at Chalk River and Whiteshell, and that there are problems with storage areas at the Pickering and Bruce reactor sites to name a few examples.

Wastes are being "consolidated" for storage at Chalk River, even though this was not originally contemplated for the site. There is no consideration of the safety and security issues raised by the inadequate nature of the current storage facilities. There is no mention of the over-capacity spent fuel

storage bays at Pickering, which constitutes a huge risk if fuel needs to be removed from the reactors in an emergency situation. Spent fuel must be removed from wet to dry storage in a timely manner and contained in secure, hardened systems away from water, and under public scrutiny.

Because storage was contemplated to be a short term need, on the way to permanent disposal, insufficient attention has been paid to the suitability of the containment for longer term storage. In addition, there is inadequate publicly-available information about radioactive inventories or classification at waste storage sites to evaluate performance of the sites. Wastes currently in storage at Chalk River, and leaking to groundwater, must be removed, classified and repackaged in secure, shielded containment, with contaminated soil remediated.

Longer term waste storage facilities must be passively safe (not reliant on water, electricity or ongoing maintenance); able to be monitored; be hardened and shielded; and facilitate retrieval and repackaging of waste as necessary.

Principles of Transparency and Independence as described above for "Disposal" must also be applied to storage.

Decommissioning

NRCan's Discussion paper speaks to 3 decommissioning options available in Canada: immediate dismantling, deferred dismantling, and "in-situ" decommissioning (referred to as "entombment" in international terminology). As noted above IAEA policy explicitly states that this is not to be considered a decommissioning strategy except in exceptional circumstances, as it inevitably leads to the site becoming a de facto disposal site. To my knowledge, in-situ decommissioning was never even contemplated in Canada before Canadian Nuclear Labs took over AECL. In fact, decommissioning of the WR-1 reactor had already been approved when CNL proposed the new "in situ" approach, with inadequate reasoning.

A radioactive waste policy for Canada must set out explicitly the circumstances under which in-situ decommissioning could potentially be considered.

Other considerations:

- Decommissioning approaches must at minimum conform to international safety standards.
- Site conditions must be fully described, including a complete list of radionuclides found in soil, ground or surface water and/or involved in any radioactive decommissioning scenario
- Radioactive wastes on site and projected decommissioning wastes must be fully inventoried
- The list of radionuclides found on site and the inventories of radioactive wastes (on site and decommissioning wastes) must include half-lives, activities (total becquerels as well as becquerels per kilogram or per litre), mode of disintegration, radioactive progeny and target organs in human receptors
- Detailed descriptions of site conditions and the waste inventories must be developed and be publicly available and peer reviewed, including by the public and Indigenous peoples, at all decommissioning stages, including in the preliminary decommissioning planning stages

- Information and inventories related to decommissioning must be available and communicated to indigenous peoples and other members of the Canadian public, including in a plain language stripped of scientific symbols and abbreviations

All decommissioning projects must include a comprehensive strategy for the transmission of Records, Knowledge and Memory (RK&M) to future generations, including a detailed inventory of all specific radionuclides included in the decommissioning wastes along with relevant physical, chemical and biological properties of each

Further, decommissioning, including the long term storage and containment of radioactive inventories, must be fully costed for any proposed new nuclear facilities, so as to provide a full and complete picture of the true cost of nuclear power (polluter pays principle). Proponents should be required to post a bond for the decommissioning of new nuclear sites.

End State Objectives: End state objectives should be set in ecological and human health terms, not administrative terms. There should be measurable objectives for ground and surface water, soil and air, and these objectives should be developed by considering the pre-development state of the site (i.e. without radioactive and toxic contamination) and the protection of human health and the environment.