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RE: Canada's Radioactive Waste Policy Framework Modernization – Canadian Nuclear Laboratories Response

Dear Mr. Delaney,

The purpose of this letter is to provide Canadian Nuclear Laboratories' (CNL) written submission to the discussion papers published by Natural Resources Canada (NRCAN) regarding Modernizing Canada's Radioactive Waste Policy Framework. Enclosed with this letter is CNL's responses to the questions posed in the four discussion papers published by NRCAN entitled 'Waste Minimization', 'Waste Storage Facilities', 'Decommissioning' and 'Disposal'.

Canadian Nuclear Laboratories (CNL) and Atomic Energy of Canada Limited (AECL) have been instrumental in the development of Canada's nuclear industry. For more than 70 years, nuclear technology has evolved to meet the needs of the world for clean, reliable energy; sustainable economic growth; and public health, safety and security. Today, CNL is actively restoring and protecting Canada's environment by reducing and effectively managing AECL's nuclear liabilities at multiple sites across Canada.

Canadian Nuclear Laboratories has an Integrated Waste Strategy that considers current and planned future waste management requirements, including activities associated with its operations, research and development, post operational clean out, facilities decommissioning, environmental remediation, legacy and historic wastes, and waste received from small generators across Canada. This requires a long-term view with consideration of the full waste management lifecycle to ensure there are long-term waste management solutions for all categories of radioactive waste. This strategy enables the holistic integration of planning waste management solutions across all activities and sites.

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Canadian Nuclear Laboratories is actively implementing long-term waste management solutions through three proposed waste management projects currently undergoing federal environmental assessments and submitted licence applications to the Canadian Nuclear Safety Commission (CNSC). The Near Surface Disposal Facility (NSDF) is a proposed disposal facility for AECL-owned low-level waste and enables the environmental cleanup mission underway at AECL-owned sites. The in-situ disposal of the Nuclear Power Demonstration (NPD) and Whiteshell Reactor (WR1) will complete the decommissioning of these two below-grade reactors and ensure long-term safety of the public and the environment. NRCAN has indicated that projects currently underway will proceed as planned.

CNL appreciates the opportunity to provide input to NRCAN, as well as to participate in engagement activities and listen to the views of the public and Indigenous groups.

Regards,

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## Modernizing Canada's Radioactive Waste Policy – Responses from Canadian Nuclear Laboratories (CNL)

Natural Resources Canada (NRCan) has launched a review of Canada's Policy Framework for Radioactive Waste with a view to modernizing it. Discussion papers have been published and comments requested. The following are Canadian Nuclear Laboratories' (CNL) responses to the questions posed in the four discussion papers published by NRCan entitled 'Waste Minimization', 'Waste Storage Facilities', 'Decommissioning' and 'Disposal'.

### Waste Minimization

1. *What are your views on waste minimization? Should Canada continue to use the concept of the waste hierarchy?*

At CNL the waste hierarchy is a key input to decisions regarding the management of all waste. Prevention and reduction is the preferred approach but, where waste is generated, reuse and recycle are preferred to disposal. The application of the waste hierarchy requires a balance of priorities including protection of health, safety, security and the environment, value for money, and technical maturity. Within the nuclear industry this optimization materializes in the application of the "As Low As Reasonably Achievable" (ALARA) principle.

The concept of waste hierarchy is important to CNL as it enables responsible environmental stewardship. Minimizing the volume of waste that must be stored and eventually be disposed of is key to effectively managing resources. It is important to note that resources needed to store and dispose of radioactive materials increase as the level or category of the waste increases. Additionally, not all elements of the waste hierarchy can be practically applied to all categories of waste. For example, there can be challenges with applying these principles to legacy radioactive waste.

At CNL, the waste hierarchy concept is also applied to waste processing and packaging decisions. By using this concept, CNL is able to avoid inefficient and wasteful practices thus significantly decreasing the total volume of material to be stored or disposed. CNL recently updated its Integrated Waste Strategy that follows the principles of the waste hierarchy and sets out our approach to managing wastes. This strategy aligns with national and international relevant best practices and includes the deployment of proven techniques to both minimize the quantity and radioactivity of CNL waste. Examples include:

- Sorting and segregation to remove items or parts of items that are clean from legacy radioactive waste streams, allowing them to be cleared, re-used, recycled or disposed of as conventional waste.
- Compacting radioactive waste to reduce the volume that ultimately needs to be disposed.

2. *What should be the role of Government, the regulator and waste owners with respect to minimizing radioactive waste?*
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CNL's Integrated Waste Strategy has been developed in accordance with government policies, regulatory requirements, and company environmental and health and safety policies.

Minimization of radioactive waste is already incentivized through regulatory aspects and existing policies such as financial guarantees and the 'polluter pays' principle. CNL is also an ISO certified 14001 company demonstrating environmentally-friendly business management through the continued accountability and improvement in its waste management practices.

3. *Are there other principles, beyond those identified by the International Atomic Energy Agency, that you believe are important to consider when designing and implementing a waste minimization program?*

Large and complex sites within the Canadian industry may need to consider non-traditional approaches to waste diversion including risk-based approaches to managing contaminated lands or structures. Further waste minimization should be taken into consideration in all lifecycle stages of a nuclear facility and not just during decommissioning and remediation. For example, consideration of construction materials during design development can minimize radioactive waste both in terms of quantity and activity.

#### **Waste storage facilities:**

1. *What are your views on how radioactive waste is currently stored in Canada?*

The ongoing management and storage of radioactive waste is an integral part of the waste life cycle, and CNL can continue to do this safely and compliantly. Where waste disposal is not available, we rely on interim radioactive waste management. As CNL's existing waste storage facilities begin to reach their design life, comprehensive aging management programs extend their service life. However, it is responsible for waste owners and operators to re-evaluate the objectives of interim waste storage and contemplate advancing disposal routes to mitigate another generation of waste storage.

2. *What should be the role of Government, the regulator, and waste owners with respect to radioactive waste storage?*

With respect to the role of government, the regulator and waste owners in the minimization of and storage of radioactive waste, CNL views that the roles and responsibilities as currently defined and exercised to be appropriate. CNL recognizes that within Canada storage of radioactive waste is subject to strict safety standards and overseen by an independent regulator, the CNSC. CNL also recognizes that Canada uses International Atomic Energy Agency (IAEA) standards to inform our regulations and guidelines. CNL agrees that waste owners/operators should be responsible for their integrated waste strategy. From CNL's perspective, a comprehensive waste strategy ensures the integration of the management of waste in activities across CNL-managed sites, and better defines pathways for all CNL-managed wastes from generation to disposal.



CNL suggests there are opportunities within the Radioactive Waste Policy framework to provide more context around the fact that radioactive waste is created in the pursuit of purposes which are beneficial to Canadian society. Furthermore, any revisions to the policy should consider language appropriate for conveying the due diligence and environmentally sound management of radioactive waste by the industry. Lastly CNL suggests that the policy should support waste producers and owners in the practice of consolidating certain types waste in order to optimize waste storage facilities, including the recognition that this will require the transport of these waste types.

### **Decommissioning:**

1. *What do you feel are important policy considerations that should influence the choice of decommissioning strategies by nuclear operators and should be considered as part of Canada's radioactive waste policy?*

In CNL's experience, the policy needs to be flexible in timing for the development and implementation of decommissioning strategies, which are likely to include a combination of prompt and deferred decommissioning, as well as even in-situ decommissioning. The availability of disposal facilities is critical in enabling efficient decommissioning activities; ideally, disposal facilities should be available before large-scale decommissioning projects begin, particularly for low-level waste, which is typically the largest volumes of wastes produced. It is important that there is flexibility in the policy such that it considers the residual risk to the public and the environment if radioactivity were left to decay in place.

It should be noted that regardless of the selected decommissioning strategy, safety must be demonstrated within the Canadian regulatory framework.

It is important to note that as more facilities in Canada reach the end of their service life, we will have more facilities moving into decommissioning and the ability to deploy different models to execute decommissioning (e.g., transfer of liability to the organization performing decommissioning). It is important that the policy remain flexible enough to allow different operators to choose the structure to execute decommissioning work.

2. *In what ways should Canada's policy address the setting of end-state objectives for decommissioning?*

CNL suggests that the policy should clearly recognize that decommissioning end-states will vary depending on multiple factors including location, design, age, safety considerations, environmental considerations, any exceptional circumstances, as well as stakeholder and Indigenous engagement. The policy should acknowledge the relationship to other federal policies that may assist in clarifying the extent of involvement with the public and Indigenous groups when establishing end-state objectives for a facility (e.g., Impact Assessment Act).

The policy could be improved by recognizing that environmental remediation is often part of a decommissioning program. Environmental remediation and decommissioning are frequently



grouped together under the same framework because the same planning principles apply, and they are often activities to be completed as part of achieving the end-state objective. Furthermore, CNL suggests that the policy should recognize that if a decommissioned site requires institutional controls because unrestricted release is not practical or reasonably achievable, that this is essentially the same or very similar to end states in other industries where a brownfield site is identified as suitable only for parkland or industrial re-use and not suitable for residential or farmland.

### **Waste Disposal:**

1. *What do you feel are important policy considerations that should influence the choice of disposal approaches by waste owners and should be considered as part of Canada's radioactive waste policy?*

CNL agrees with the considerations discussed in the policy paper but suggests that exceptional circumstances or complexity of operations should also be recognized as considerations that influence the choice of disposal approach. CNL is responsible for large and complex research institutions where historical operations and events have led to contamination of the environment. CNL's cleanup mission underway will result in a very large volume of waste being produced locally (millions of cubic metres), which led to proposed solutions influenced by this context. CNL is also of the opinion that it is critical to acknowledge that different disposal facility designs and options exist for the various waste types, as reflected within IAEA guidance. Regardless of the design selected, safety must be demonstrated within the Canadian regulatory framework (i.e., there can be multiple solutions but are all safe).

The policy should be supportive and flexible enough for collaboration by waste owners. In general, there is a desire to keep the number of waste repositories to a minimum; as a result, transport of radioactive waste is necessary, and the industry has proven this can be done safely. Such acknowledgement within the policy would provide support to waste owners in the implementation of their consolidation strategies.

CNL views practicing waste minimization and diversion as key to managing a disposal facility capacity as an asset.

2. *What should be the roles and responsibilities of government, the regulator, and waste owners with regards to radioactive waste disposal facilities, including:*
  - *Funding,*
  - *Closure of a disposal facility and its institutional control, and*
  - *Indigenous and Public Engagement and involvement in site selection and post-closure?*

In principle CNL agrees with the general aspects of this policy paper including the roles and responsibilities as currently defined and implemented is appropriate. However, the policy should recognize that other federal or provincial legislation may provide clarity regarding the level of involvement of public and Indigenous groups.



CNL would suggest that regulatory control during institutional control does not necessarily need to be with the nuclear regulator once past a facility's (radioactive) hazardous lifetime. This could provide the public with re-assurance while acknowledging no nuclear risk exists.

CNL suggests that the policy could also be enhanced to provide more context and background on radioactive waste in Canada. Specifically, Canada has sites across the spectrum of waste inventories, from a few hundred of cubic metres, up to millions of cubic metres, and distances between waste generators is thousands of kilometres. Furthermore, the policy could recognize that waste disposal technologies are supported by modern science and engineering in order to counter misconceptions the public typically have about waste disposal.