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# Canada's Policy for Radioactive Waste Management and Decommissioning



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*Aussi disponible en français sous le titre : La Politique canadienne en matière de gestion des déchets radioactifs et de déclassé*

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# Nuclear technologies and their radioactive waste: Canadian context

Canada is a world leader in the development and deployment of nuclear technologies. Fuelled by the world's richest deposits of uranium from Saskatchewan, nuclear energy enables Canada to have one of the lowest emitting energy mixes worldwide. Nuclear energy is recognized internationally as playing an important role in meeting climate targets and achieving a net-zero emissions economy by 2050. As a non-emitting source of energy generation, nuclear energy produces electricity with almost no harmful emissions of greenhouse gases. In addition, Canadian nuclear technologies supply the world with radioisotopes for life-saving cancer treatments and medical diagnoses. It supports Canadian industries, such as the agriculture, aviation, mining and petroleum industries. Moreover, nuclear technology has made it possible for scientists in our universities and research establishments to engage in ground-breaking research. Nuclear energy holds historical importance in Canada and continues to be an important part of Canada's economy and energy mix.

Nuclear research and the development and use of nuclear technologies result in the generation of radioactive waste. Radioactive waste is defined as any material (liquid, gaseous, or solid) that contains a radioactive nuclear substance for which no further use is foreseen. Radioactive waste is produced from the normal operation and decommissioning of nuclear facilities, the production and use of radionuclides in medicine, industry, and research, and nuclear or radiological emergencies. It is also found in sites where nuclear activities were practiced in the past. In Canada, radioactive waste was first generated in the 1930s as a result of the mining and processing of pitchblende ore for the production of radium. Over the years, the inventory of radioactive waste has grown as our use of nuclear technologies expanded. While our knowledge, techniques, and regulation of the management of radioactive wastes have advanced over the years, early waste management practices may have resulted in impacts on a number of communities, including those of Indigenous peoples and their environments.

## Federal government responsibilities

The federal government is responsible for the Policy for Radioactive Waste and Decommissioning (the Policy). In terms of nuclear energy and radioactive waste, the Government's top priority is ensuring the health, safety, and security of persons in Canada, protection of the environment, and the implementation of Canada's international commitments on the peaceful use of nuclear energy. International commitments include the *Treaty on the Non-Proliferation of Nuclear Weapons* and, specific to nuclear waste, the *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*, under the auspice of the

International Atomic Energy Agency, which includes requirements to make certain that all radioactive waste in Canada is managed safely for generations to come. Additionally, the federal government is responsible for taking into consideration relevant national and international sustainable development goals, including those relating to nuclear matters, such as the UN Sustainable Development Goal 12: Ensure sustainable consumption and production patterns.

## Our vision

Protecting the health, safety and security of people and the environment is the federal government's top priority when it comes to nuclear energy and radioactive waste. All radioactive waste in Canada is currently safely managed in compliance with Canadian legislation and in accordance with international standards at facilities licensed by Canada's independent nuclear regulator—the Canadian Nuclear Safety Commission (CNSC). The federal government is committed to ensuring that safe solutions are in place for managing radioactive waste and decommissioning for generations to come, which includes respecting any obligations related to nuclear non-proliferation. Arrangements for the management, including disposal, of materials may be different for high-level radioactive waste, intermediate-level radioactive waste, low-level radioactive waste, and uranium mine and mill tailings.

Recognizing that radioactive waste can remain hazardous for very long periods of time, waste generators and owners must manage radioactive waste, including its disposal, in a manner that protects human health, safety, security, and the environment over the long term. The federal government is responsible for ensuring that this takes place, as responsibility for nuclear matters falls within federal jurisdiction under the Constitution. In the area of radioactive waste management and decommissioning, like in other areas of the nuclear field, the federal government has developed and maintains a framework of policies, legislation, regulation, and guidelines to carry out its responsibilities.

The Government of Canada's vision for radioactive waste management and decommissioning is as follows:

- The generation of radioactive waste is minimized to the extent reasonably achievable, and waste management is optimized, taking into account health, safety, security, environmental and socio-economic considerations;
- The management of radioactive waste, including its storage and disposal, must ensure that both human health and the environment will be protected, now and in the future, to reduce the burden on future generations;
- All radioactive waste and decommissioning activities and all radioactive waste management facilities, locations, and sites are safely managed by waste generators and/or owners and regulated by Canada's nuclear regulator, the

CNSC, to protect human health, safety, security and the environment now and over the long term, and to ensure nuclear non-proliferation;

- Radioactive waste generators and/or owners, governments, Indigenous peoples, scientific experts, current and prospective nuclear host communities, and other interested Canadians regularly collaborate on and contribute, in an open and transparent manner, to the planning, development, review and implementation of an Integrated Strategy for Canada's Radioactive Waste;
- The government commits to the implementation of the *United Nations Declaration on the Rights of Indigenous Peoples* in consultation and collaboration with Indigenous peoples, with regards to radioactive waste management and decommissioning;
- By 2050, key elements of Canada's radioactive waste disposal infrastructure are in place, and planning is well under way for the remaining facilities necessary to accommodate all of Canada's current and future radioactive wastes; and
- Canada's advances in technology and approaches to radioactive waste management and decommissioning, its consistent fulfillment of international commitments and obligations, and its contributions to international discourse and practices in these areas establish Canada as a centre of expertise and leadership.

## **A policy based on four priorities**

To achieve its vision, the Government of Canada has established four priorities that form the basis of Canada's Policy for Radioactive Waste Management and Decommissioning (the Policy):

1. protection of health, safety, security of people and the environment, and ensuring nuclear non-proliferation;
2. inclusive engagement, openness, and transparency on radioactive waste management and decommissioning matters;
3. recognition of Canada's deep commitment to building partnerships and advancing reconciliation with Indigenous peoples related to the management of radioactive waste and decommissioning, based on the recognition of rights, respect, collaboration and partnership; and
4. global excellence in the fields of radioactive waste management and decommissioning.

In addition to protecting the health, safety and security of people and the environment, while ensuring the highest levels of non proliferation, when it comes to nuclear technologies and the resulting radioactive waste, another priority is a commitment to inclusive engagement, openness, and transparency on radioactive waste management and decommissioning. Within our commitment to engagement, is the recognition that Indigenous peoples are rights holders and that this has important implications on how they are engaged and consulted as appropriate, by the federal government in particular, on radioactive waste management and decommissioning matters. Finally, the Policy

prioritizes the importance of achieving global excellence in radioactive waste management and decommissioning to continue our progress domestically and share Canadian insights and approaches internationally.

The Policy elaborates national principles and responsibilities under each of these four priorities to provide leadership and guidance for radioactive waste management and decommissioning activities in Canada.

The Policy recognizes and is aligned with federal legislation, particularly the *Nuclear Safety and Control Act*, the *Impact Assessment Act* and the *Nuclear Fuel Waste Act*, as well as other legislation, associated regulations, and other policy tools that further support radioactive waste management. These policy tools are regularly reviewed and updated by the federal government, as required, to ensure they remain relevant and effective. Likewise, the federal government, in the spirit of continuous improvement, will review this Policy as appropriate and at least every 10 years, notably to ensure that it maintains alignment with International Atomic Energy Agency guidance and the implementation of the *United Nations Declaration on the Rights of Indigenous Peoples* in Canada.

## **Scope of the Policy**

Canada's Policy for Radioactive Waste Management and Decommissioning applies to radioactive waste from past practices, including historic wastes, those accumulated from current practices, future radioactive wastes, and to the decommissioning of nuclear facilities and sites. It also applies to radioactive waste generated unintentionally, including from nuclear or radiological emergencies, or unintended releases.

Reprocessing, the purpose of which would be to extract fissile material from nuclear fuel waste for further use, is not presently employed in Canada, and so is outside the scope of this Policy; if ever brought forward, the radioactive waste from such a project would fall within the scope of this Policy. Reprocessing in Canada would require consideration of all relevant factors by the federal government prior to its deployment, including ensuring the health, safety and security of people in Canada, and compliance with non-proliferation safeguards and international treaties. The government of Canada remains deeply committed to the 1970 Treaty on the Non-Proliferation of Nuclear Weapons (NPT), which remains the only legally binding global treaty promoting nuclear non-proliferation and disarmament.

Radioactive wastes resulting from the operations of the Department of National Defence are the responsibility of that Department, which has established its own requirements for the protection of health, safety, security and the environment, which must be consistent with requirements under the *Nuclear Safety and Control Act* (NSCA), to the extent practicable. This Policy does not address radioactive waste that is the responsibility of the Department of National Defence.



Materials found in the environment having radioactive elements of natural origin are referred to as naturally occurring radioactive material (NORM). NORM is regulated by the provinces and territories and so this Policy does not address NORM, other than those associated with the development, production or use of nuclear energy or technologies and those associated with the transport and import/export of nuclear substances.

## The Policy

### Health, safety, and security of people and the environment

1.0 Protection of the health, safety, and security of people and the environment, and ensuring nuclear non-proliferation, are the federal government's top priorities with respect to radioactive waste management and decommissioning. The government is committed to ensuring responsibilities are clearly delineated, and the necessary policy and legislative framework is in place to establish requirements, guidance, licensing, and compliance, in these priority areas. This applies to waste arising from nuclear operations and technologies, including past, present and future activities, decommissioning, and from nuclear or radiological emergencies.

The federal government:

- 1.1 ensures radioactive waste management and decommissioning activities, including transportation and disposal, are carried out in a comprehensive and integrated manner that prioritizes the health, safety and security of people and the environment, and ensures nuclear non-proliferation;
- 1.2 maintains and updates, as necessary, a national legislative and regulatory regime, centered on an independent nuclear regulator that makes decisions using inclusive, open, and transparent public hearings, to oversee and regulate radioactive waste management and decommissioning, including funding requirements, in accordance with waste management and decommissioning plans;
- 1.3 recognizes the importance of ensuring all radioactive wastes are managed safely, and will ensure the proper management of historic radioactive waste in the event the generator or the owner no longer exist, or the current generator or owner cannot reasonably fulfill their responsibilities or be held responsible;
- 1.4 recognizes the timeframes associated with the management of radioactive waste and the associated obligations to ensure ongoing responsibility of radioactive waste disposal facilities, locations, and sites once closed, so it remains safe and secure for people and the environment in perpetuity. The federal government accordingly ensures:

- 1.4.1 that responsibility for maintaining institutional controls over the long term, including the preservation of records and knowledge management of radioactive wastes, is assigned, in an open and transparent manner, to an appropriate entity;
- 1.4.2 that there is continuity of responsibility over successive entities if necessary, and;
- 1.4.3 where no appropriate federal entity is available, it works with other levels of government, including Indigenous governments, where appropriate, to develop arrangements to ensure such controls are maintained.

Waste generators and waste owners will:

- 1.5 ensure protection of human health, safety, security and the environment, and ensure nuclear non-proliferation, for present and future generations in their radioactive waste management and decommissioning activities, including transportation and disposal, and in the development and operation of their radioactive waste management facilities, locations, and sites;
- 1.6 ensure adequate funding is available for long term management of radioactive waste, including disposal sites, as well as the decommissioning, clean-up, remediation, and closure of these facilities and sites, as applicable;
- 1.7 prevent and minimize the generation, volumes and activity levels of their radioactive wastes, to optimize waste management, through appropriate facility design measures and through operating and decommissioning practices, including the recycling and reuse of materials, while taking into account health, safety, security, nuclear non-proliferation, environmental and socio-economic considerations;
- 1.8 follow relevant national standards to characterize, classify and record their radioactive waste inventory in order to define and implement radioactive waste management and decommissioning solutions that are commensurate with their risks in both the short and long term;
- 1.9 decommission facilities, locations, and sites within an appropriate timeframe to reduce the burden on future generations, by selecting a decommissioning strategy to be submitted for approval by the regulator.

## **Inclusive engagement, openness, and transparency**

2.0 The federal government is committed to inclusive engagement, openness, and transparency with Indigenous peoples, provinces, territories, interested communities, including current and prospective host communities, scientific experts, waste generators and owners, and other interested persons in Canada on radioactive waste management and decommissioning.

The federal government:

- 2.1. oversees the development, maintenance and implementation, by waste generators and owners, of an Integrated Strategy for Canada's radioactive waste to address long term plans for waste management, which will be reviewed and updated as appropriate upon request from the Minister of Natural Resources. Accordingly, it ensures that waste generators and owners:
  - i. develop and advance plans for the necessary infrastructure to effectively manage Canada's radioactive waste and decommissioning activities;
  - ii. collaborate with other waste owners or generators on their plans for the advancement, development and implementation of comprehensive and nationally integrated radioactive waste management solutions in a timely manner to reduce the burden of waste management on future generations, and
  - iii. document and report on their radioactive waste inventories;
- 2.2. ensures its communications, information, and documentation on radioactive waste management and decommissioning are easily accessible by the public, accurate, and are kept up to date in order to facilitate, among other actions, open, transparent, and inclusive engagement;
- 2.3. accepts and fulfills its obligations for radioactive waste management and decommissioning activities associated with historic wastes for which no entity other than the federal government exist or the entity cannot reasonably fulfill its responsibilities or be held responsible, and past wastes that were generated by federal entities in the formative years of Canadian nuclear research and development.

Waste generators and waste owners will:

- 2.4. plan radioactive waste management and decommissioning projects in an open and transparent manner, with early and ongoing input from Indigenous peoples, provinces, territories, interested communities, including current and prospective host communities, scientific experts, and other interested persons in Canada;
- 2.5. ensure their communications, information, and documentation on radioactive waste management and decommissioning are easily accessible by the public, accurate, and are kept up to date in order to facilitate, among other actions, open, transparent and inclusive engagement;
- 2.6. collaborate with one another to plan and develop long term solutions for radioactive waste that optimize radioactive waste management and decommissioning approaches and infrastructure at a national level. In doing so, waste generators and owners will:
  - 2.6.1. Develop, implement, and maintain an Integrated Strategy for Canada's radioactive waste that includes:

- i. A description of the current waste management situation in Canada in terms of current and future volumes, including wastes resulting from decommissioning activities and from all reactor types, including potential radioactive wastes from emerging technologies, including small modular reactors, and their characteristics, locations, and ownership of the waste;
  - ii. an update on current plans and progress in advancing long-term solutions for Canada's wastes, including funding plans, timelines for implementation, as well as gaps that must be addressed;
  - iii. conceptual approaches for dealing with Canada's current and future radioactive wastes, including technical options and justifications for management, including disposal, of the various waste types; and
  - iv. considerations regarding the staging, integration, establishment and operation of long-term waste management facilities;
- 2.6.2. engage with Indigenous peoples, provinces, territories, interested communities, including current and prospective host communities, scientific experts and other interested persons in Canada, to ensure that they can contribute, in an open and transparent manner, to the development, implementation, and maintenance of an Integrated Strategy for Canada's radioactive waste.
- 2.6.3. submit the Integrated Strategy for Canada's radioactive waste to the federal government for review and consideration as requested by the Minister of Natural Resources;
- 2.7. demonstrate a commitment to ongoing scientific, technical and safety learning, as well as collaboration, innovation and sharing of operational experience and research in radioactive waste management and decommissioning, both domestically and internationally.

## **Canada's commitment towards building partnerships and advancing reconciliation with Indigenous peoples**

3.0 In the spirit of reconciliation and recognizing the unique status of Indigenous peoples in Canada, the federal government is committed to meaningful engagement with Indigenous peoples in Canada in the planning, development, and operation of radioactive waste management and decommissioning projects. Indigenous peoples, as rights holders and stewards of the land and water, are critical partners in Canada's vision and strategy for radioactive waste management and decommissioning that protects the health, safety, and security of people and the environment for current and future generations.

The federal government:

- 3.1. acknowledges, respects and honours that First Nations, Inuit and Métis peoples have unique status and rights in Canada, as recognized and affirmed in the *Constitution Act, 1982*, and affirms that the honour of the Crown guides the conduct of the Crown in all of its dealings with Indigenous Peoples;
- 3.2. commits to reconciliation and the implementation of the United Nations Declaration on the Rights of Indigenous peoples and that the conduct of the Crown will be guided by any framework or measure developed by Canada for Indigenous reconciliation, and that is relevant to radioactive waste management and decommissioning, including measures taken for the implementation of the *United Nations Declaration on the Rights of Indigenous Peoples Act*;
- 3.3. commits to facilitating meaningful Indigenous engagement, on an early and on-going basis, through capacity building among Indigenous peoples, information sharing and collaboration;
- 3.4. recognizes that early, continuous and meaningful engagement with Indigenous peoples that may be affected by radioactive waste management and decommissioning projects, which aims at securing their free, prior and informed consent, provides opportunities to build trust and strengthen mutually beneficial and respectful relationships with Indigenous peoples by ensuring Indigenous communities are informed and supported with regards to these projects;
- 3.5. recognizes the importance of Indigenous knowledge and the important role that Indigenous peoples play in relation to the stewardship of the lands and waters of their territories over several generations;
- 3.6. acknowledges that some radioactive wastes in Canada are located within Indigenous traditional and treaty territories, and that these wastes may have been created and stored without prior engagement or consultation, and recognizes the importance of working together with affected Indigenous peoples to find a path forward to address these past issues.

Waste generators and owners will:

- 3.7. acknowledge the unique status of Indigenous peoples as rights holders in Canada; commit to respecting their rights; and work in partnership with Indigenous peoples to gain a greater understanding of the implications of radioactive waste management and decommissioning projects on these rights;
- 3.8. work in partnership with Indigenous peoples to gain a greater understanding of their Indigenous knowledge and advice with regards to radioactive waste management and decommissioning projects;
- 3.9. demonstrate meaningful and respectful engagement, on an early and ongoing basis, with Indigenous peoples who may be affected in the siting, construction, operation, and monitoring of radioactive waste management and decommissioning projects;

- 3.10. commit to building capacity among Indigenous peoples to permit their meaningful participation in engagement in the planning, development, and operation of radioactive waste management and decommissioning projects.

## **Global Excellence in radioactive waste management and decommissioning**

4.0 The federal government is committed to pursuing global excellence in the fields of radioactive waste management and decommissioning in Canada through international collaboration on effective technologies, approaches and policies, by honouring its international commitments and respecting international guidance, and by providing international expertise as appropriate.

The federal government:

- 4.1. is committed to providing international leadership and collaborating with the international community to exchange expertise on policies, technologies, and practices related to radioactive waste management and decommissioning, recognizing the important role that Canadian waste generators and owners, Indigenous peoples, and interested groups in Canada can play in this work;
- 4.2. is committed to learning from the global community, and to benchmarking its progress on radioactive waste management and decommissioning in Canada against international approaches;
- 4.3. honours its international obligations in the area of radioactive waste management, decommissioning, and nuclear non-proliferation;
- 4.4. is committed to respecting international guidance in the area of radioactive waste management and decommissioning, recognizing Canada's domestic context may result in the implementation of alternative strategies that are protective of human health, safety, security and the environment, and are approved by Canada's nuclear regulator;
- 4.5. is committed to the principle that radioactive waste generated in other countries are not to be disposed of in Canada and radioactive waste generated in Canada will be disposed of in Canada, with the exception of certain radioactive wastes subject to return arrangements;

recognizing that

- 4.5.1. for radioactive sources manufactured in Canada that are sold abroad for industrial irradiation, medical, agricultural, and other beneficial uses, it will permit the repatriation of disused sources to Canada for management or disposal under the return-to-manufacturer principle or prior arrangement between Canada and the other country, or
- 4.5.2. under exceptional circumstances, radioactive sources that were not from Canada may be brought to Canada for purpose of protecting the health, safety and security of people and the environment and with the agreement of the federal government.