Date: December 8th 2017

From: Dr. J.R. Walker

To: Candida Cianci, Environmental Assessment Specialist
Canadian Nuclear Safety Commission

By email: cnsc.ea-ee.ccsn@canada.ca

Subject line: ATTN: Candida Cianci - Comments on Draft Environmental Impact Statement: In Situ Decommissioning of the WR-1 Reactor (CEA Registry Number 80124)

CEAA Reference number: 80124

Comments:

Dear Ms Cianci,

Thank you for the opportunity to comment on the Draft EIS for the In Situ Decommissioning of WR-1 at the Whiteshell Laboratories Site.

My comments are attached.

Best Regards,

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Dr. J.R. Walker

Thank you for the opportunity to provide comments on the Draft Environmental Impact Statement (EIS) [1] for the proposed *in situ* decommissioning (ISD) of WR-1 at the Whiteshell Laboratories (WL) site. My comments follow.

1.0 Introduction

The Draft EIS [1] and the associated project proposal contain numerous deficiencies. The extent and gravity of these deficiencies preclude a conclusion that the project is unlikely to cause significant adverse environmental effects, taking into consideration the implementation of mitigation measures.

For example:

a) The proposal employs inadequate technology;

b) The proposal does not meet regulatory requirements with respect to the health and safety of persons and the protection of the environment; and

c) The proposal creates an on-going liability for Canada.

2.0 Inadequate Technology

The International Atomic Energy Agency (IAEA), defining the safety requirements for the decommissioning of facilities in *General Safety Requirements Part 6: Decommissioning of Facilities* [2], describes two possible decommissioning strategies, namely *immediate dismantling* and *deferred dismantling.* In discussing these two strategies, the IAEA notes the inappropriateness of entombment, as follows:

> 1.10. A combination of these two strategies may be considered practicable on the basis of safety requirements or environmental requirements, technical considerations and local conditions, such as the intended future use of the site, or financial considerations. **Entombment, in which all or part of the facility is encased in a structurally long lived material, is not considered a decommissioning strategy and is not an option in the case of planned permanent shutdown.**[1] It may be considered a solution only under exceptional circumstances (e.g., following a severe accident).

An example of how this safety requirement is incorporated into the policies of IAEA Member States can be seen in a recent regulatory basis document from the US Nuclear Regulatory Commission (NRC) [3], which states that “The NRC staff position is that entombment should be used as a last resort for the decommissioning of power reactor facilities, with the expectation that this method would be selected only under unique decommissioning circumstances.” The US NRC document [3] goes on to say that “Entombment should be used only if this option provides more benefit than harm to public health and

1 Emphasis mine.

safety and the environment and does not create a legacy situation to be managed by future generations.”

Through entombment of the WR-1 reactor, the proposal in the Draft EIS [1] would create a near surface disposal facility for long-lived intermediate level waste [1, 4, 5] that extends to approximately 18.5 m below grade (See Section 3.2 of the Draft EIS [1]).

In *Disposal of Radioactive Waste* [6], the International Atomic Energy Agency (IAEA) notes that the specific aims of radioactive waste disposal are:

(a) To contain the waste;
(b) To isolate the waste from the accessible biosphere and to reduce substantially the likelihood of, and all possible consequences of, inadvertent human intrusion into the waste;
(c) To inhibit, reduce and delay the migration of radionuclides at any time from the waste to the accessible biosphere;
(d) To ensure that the amounts of radionuclides reaching the accessible biosphere due to any migration from the disposal facility are such that possible radiological consequences are acceptably low at all times.

Different classes of radioactive waste require different disposal concepts, depending upon the length of time that the waste remains a hazard. This is discussed at length in both Canadian and international guidance [6 – 11].

Near surface disposal is only appropriate for very low level waste (VLLW) and low level waste (LLW), because near surface disposal facilities are located in the biosphere, and, hence, can be accessed by members of the public at the end of the institutional control period. Intermediate level waste (ILW) and high level waste (HLW), which contain larger quantities of long lived radionuclides, must be disposed in deeper geological disposal facilities [10].

Consequently, the definitions of low level and intermediate level waste given in the *Classification of Radioactive Waste*, GSG-1, International Atomic Energy Agency (IAEA), 2009 [8] reflect the different technologies required for disposal of these wastes:[2]

> *Low level waste (LLW):* Waste that is above clearance levels, but with limited amounts of long lived radionuclides. Such waste requires robust isolation and containment for periods of up to a few hundred years and is suitable for disposal in engineered near surface facilities. This class covers a very broad range of waste. LLW may include short lived radionuclides at higher levels of activity concentration, and also long lived radionuclides, but only at relatively low levels of activity concentration.
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> *Intermediate level waste (ILW):* Waste that, because of its content, particularly of long lived radionuclides, requires a greater degree of containment and isolation than that provided by near surface disposal. However, ILW needs no provision, or only limited provision, for heat dissipation during its storage and disposal. ILW may contain long lived radionuclides, in

2 Similar concepts and wording are used in Canadian Standard N292.0-14, *General Principles for the Management of Radioactive Waste and Irradiated Fuel* [11].

particular, alpha emitting radionuclides that will not decay to a level of activity concentration acceptable for near surface disposal during the time for which institutional controls can be relied upon. Therefore, waste in this class requires disposal at greater depths, of the order of tens of metres to a few hundred metres.

The various technological requirements for the disposal of radioactive wastes are summarized in FIG. 1 [8]:

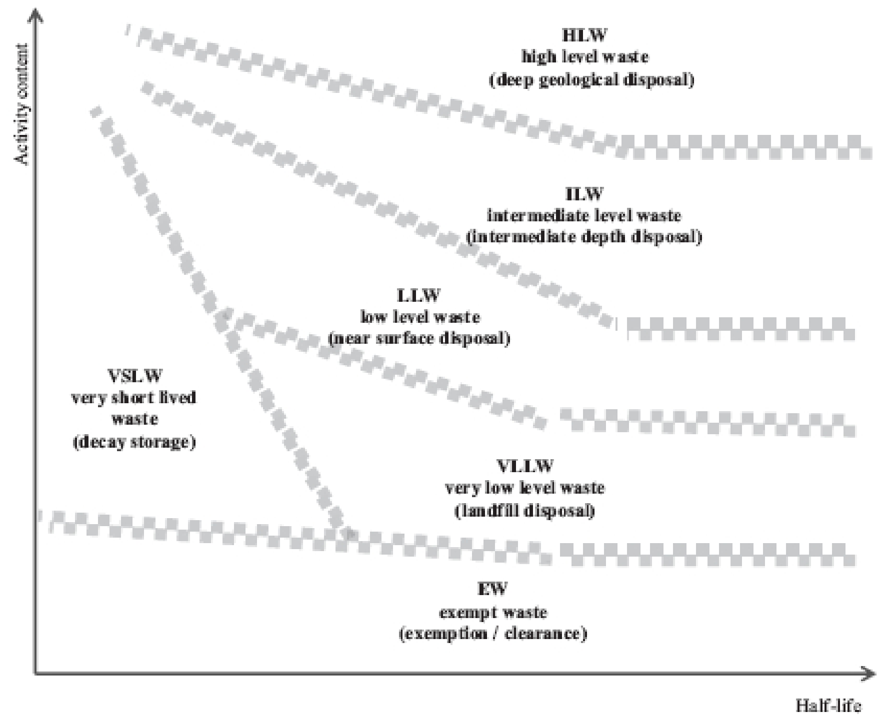

FIG. 1. Conceptual illustration of the waste classification scheme.

Entombment is an inappropriate technology for the decommissioning of WR-1, since it would place intermediate level waste in a near surface repository, contrary to Canadian and international guidance [6 – 11]. To provide assurance of long-term safety, institutional control would be required for an indefinite period of time. The need for the perpetual institutional control of entombed nuclear reactors is acknowledged in US Department of Energy document *DOE EM Project Experience & Lessons Learned for In Situ Decommissioning* [12], which states "ISD projects are presumed to be under indefinite institutional control of the U.S. Government". This US Department of Energy document [12] is referenced in the Draft EIS [1], where it is given as reference "(U.S. Department of Energy 2013)".

In the Draft EIS [1], the authors state that active institutional controls will continue *after* the stated 300-year institutional control period and will be maintained in perpetuity. These perpetual institutional controls would include, in general, physical barriers/fencing, signage, and land title instruments/deed restrictions (Section 3.1.2 of the Draft EIS [1] *et seq*). For example, the authors state that "Turfgrass will be established over the engineered cover and a six foot high chain link perimeter fence installed and maintained for perpetuity" (Section 6.6.5.2.2 of the Draft EIS [1]) and "The WL site will now have restricted use in proximity to the encapsulated WR-1 Building over an indefinite period of time associated with institution control" (Sections 6.9.6.1.2 and 9.2.8 of the Draft EIS [1]). These perpetual active institutional controls are credited in the assessment to deter both humans and non-human biota from accessing the WR-1 site.

This concept of perpetual active institutional controls to ensure safety is contrary to both Canadian and international guidance [6 – 10, 13] which notes that active institutional controls can be relied upon for only a limited period of time (up to a few hundred years). The use of institutional controls for an indefinite period would impose an excessive burden on future generations and does not provide confidence that safety can be assured over the time period that is compatible with the assurance of institutional and financial stability [10].

As per Canadian and international guidance [6 – 11]:

a) Ontario Power Generation (OPG) is currently seeking to dispose of low level and intermediate level wastes in a deep geologic repository [14]; and
b) Canadian Nuclear Laboratories announced in 2017 October that it would follow IAEA guidance and would no longer attempt to dispose of intermediate level wastes in a proposed near surface disposal facility at Chalk River Laboratories in Ontario and would, instead, manage intermediate level waste in interim storage until a long-term disposal solution for this category of radioactive waste has been developed and approved [15].

3.0 Noncompliance with Regulatory Requirements with Respect to the Health and Safety of Persons and the Protection of the Environment

3.1 Inadequate Safety Assessment

The safety assessment presented in the Draft EIS [1] and associated documents, i.e., [4] and [16], is inadequate since it employs an incorrect methodology and provides an incomplete assessment.

3.1.1 Non-Conservative Assignment of Critical Groups

The critical group is defined to be an individual receiving a dose that is representative of the more highly exposed individuals in the population [17].[3]

For the closure phase, the authors present results for "Farm F" and harvesters (Section 6.7.1.6.1 of the Draft EIS [1]).

For the post-closure phase, the authors evaluate "Farm A", an on-site farm (located on the grouted-up WR-1), and harvesters (Section 6.7.1.6.2 of the Draft EIS [1]).

The results provided in Sections 6.7.1.6.1.2 and 6.7.1.6.2.2 of the Draft EIS [1] show that doses to each of these critical groups would be below the dose constraint of 0.3 mSv/year [6, 7, 9, 10, 18], for closure and post-closure phases, respectively.

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3 The "critical group" concept has been replaced by the "representative person" concept, which is defined to be an individual receiving a dose that is representative of the more highly exposed individuals in the population and replaces, the 'average member of the critical group' [17]. To avoid confusion with the terminology used in the Draft EIS [1], "critical group" will be used in these comments rather than "representative person".

However, the provided analysis is not conservative.

As noted in the WL DRL document [19], a wide range of types and scales of farming exists on both sides of Winnipeg River from Seven Sisters Falls to Lac du Bonnet; some inhabitants of the banks of the Winnipeg River in the vicinity of WL use well water and some use river water. The WL DRL document uses conservative assumptions in modelling exposures (Section 5.4 of [19]):

- For liquid effluent modelling, the critical group was conservatively assumed to draw all their water from the Winnipeg River. Thus, 100% of the drinking water was assumed to be contaminated.
- For modelling airborne effluents, the critical groups were assumed to obtain their drinking water from wells, which were assumed to be contaminated.

These conservative assumptions were not used in the Draft EIS [1]:

- For the closure phase, residents of Farm F were modelled as ingesting well water (Table 6.7.1-7 of the Draft EIS [1]), rather than river water, which is a non-conservative assumption.
- For the post-closure phase, residents of Farm A and the on-site farm were modelled as ingesting river water (Table 6.7.1-10 of the Draft EIS [1]). This may be a conservative assumption for Farm A, but it is a non-conservative assumption for the on-site farm.

Conservative modelling should be used in the assessment of hazards to critical groups. WR-1 is not immediately adjacent to the Winnipeg River, so, over the long time period that the proposed facility represents a hazard (thousands of years), an on-site farm using a well that intersects the plume from WR-1 may be quite likely. Hence, an on-site farm consuming well water should be considered as a critical group. Table 7.3.8-1 of the Draft EIS [1] gives the assessed doses to the adult, child, and infant residents of an on-site farm who use well water for drinking. These doses all exceed the dose constraint of 0.3 mSv/year [6, 7, 9, 10, 18], with the exception of an infant consuming cow's milk (rather than nursing or consuming formula).

3.1.2 Inappropriate Use of Environmental Risk Assessment Methodology

Environmental Risk Assessment (ERA) is a planning tool that aims to identify, quantify, and characterize the risk posed by contaminants and physical stressors on human and non-human biota, including the magnitude and extent of potential effects associated with a facility [20].

The authors employ a risk matrix method to produce a qualitative measure of the risk posed by contaminants to humans and non-human biota by multiplying a subjective measure of the annual likelihood of an effect (Rare, Unlikely, Possible - Occasional, etc) by a subjective measure of the consequences of the effect (Low, Moderate, High, etc). The risk matrix used in the Draft EIS [1] is given in Table 7.1.2-1. The authors assign "Rare" and "Moderate", respectively, to the likelihood and consequences of both human habitation and human intrusion to produce a "Moderate" risk matrix priority level to both human habitation and human intrusion (Section 7.3.8.2 of the Draft EIS [1]).

However, Environmental Risk Assessment is an inappropriate technique for the assessment of the decommissioning of nuclear facilities and the disposal of radioactive waste, as noted below.

In Specific Safety Guide SSG-23, *The Safety Case and the Safety Assessment for the Disposal of Radioactive Waste* [9], the IAEA states:

> 6.57. If human intrusion cannot be excluded for a certain disposal facility, the consequences of one or more plausible intrusion scenarios should be assessed. However, estimates of the probability of intrusion are uncertain and it is recommended in Ref. [21][4] that safety assessment should seek to evaluate the doses associated with human intrusion that may occur, but should not attempt to use a risk based concept that uses as a basis for assessment the product of the probability of intrusion and the dose arising from the intrusion.

Further, the IAEA notes that human intrusion is a likely event for near surface disposal facilities [9]:

> 6.52. Future human actions may disrupt a waste disposal system. Human action affecting the integrity of a disposal facility and potentially giving rise to radiological consequences is known as human intrusion. Human intrusion is particularly relevant for disposal facilities at or near the surface. Most human activities (e.g. construction operations, farming, etc.) that could lead to inadvertent human intrusion into a waste disposal facility take place at limited depths of tens of metres (typically down to 30 to 50 m below the surface). Over long time frames, human intrusion into such a facility may be quite likely. Human activities that reach depths greater than 30 m are much less likely, but include drilling (e.g. for water, oil or gas), exploration and mining activities, geothermal heat extraction or the storage of oil, gas or carbon dioxide. ...

Section 7.3.8.2.2 of the Draft EIS [1] states that human intrusion would result in doses that exceed the public dose limit [22]. Over the long time period that the proposed facility represents a hazard, and given the IAEA's statement on the likelihood of human intrusion into a near surface facility, a more appropriate appraisal of the likelihood and consequences of human intrusion might be "likely - frequent" and "very high", respectively, leading to "highest" risk (See Tables 7.1.2-1 and 7.1.3-1 of the Draft EIS [1]).

The authors should refrain from using a risk-based concept and, instead, follow appropriate Canadian and international guidance.

3.1.3 Inadequate Assessment of Barrier Failure

At the end of the design life, the engineered barriers of the proposed facility must be assumed to fail. The design life of the proposed facility and its cover are stated to be 300 years [1, 4]. The grout and cover integrity are stated to last 500 years [4].

The failure of these engineered barriers is modelled by increasing the rate of radionuclide transfer to groundwater (Section 7.3.7 of the Draft EIS [1]).

No analysis is provided on the impact of the direct transfer of radionuclides out of the proposed facility to the accessible biosphere by natural weathering or by normal human activities such as road or building construction, farming, etc. This pathway should be assessed and presented, since the

4 The references and footnotes conform to the numbering scheme in these comments, and not those of the original text.

radiological and nonradiological hazards represented by the proposed facility will exist long after the proposed facility, its cover, and its grout, have all degraded.

The transfer of material from a single exploration borehole to the accessible biosphere results in radiation doses in excess of both the dose constraint (0.3 mSv/year) [6, 7, 9, 10, 18] and the public dose limit (1 mSv/year) [22] (Section 7.3.8.2.2 of the Draft EIS [1]). The direct transfer of radionuclides out of the proposed facility to the accessible biosphere by natural weathering or by normal human activities such as road or building construction, farming, etc. should be modelled and the resultant doses assessed against the dose constraint of 0.3 mSv/year [6, 7, 9, 10, 18].

In the context of glaciation, the *Decommissioning Safety Assessment Report* [4] notes:

> The CNSC[5] has established Unconditional Clearance Levels (or concentrations) at which a person may safely abandon or dispose of a radioactive substance. The Unrestricted Clearance Levels may be found in Schedule 2 of the CNSC Nuclear Substances and Radiation Devices Regulations [23].[4] These Unrestricted Clearance Levels correspond to a probable exposure of 10 µSv/a to a resident member of the public residing in the vicinity and include consideration of doses from the inhalation and ingestion of radioactive materials and from external gamma radiation. ...

The *Decommissioning Safety Assessment Report* [4] then discusses potential doses to the public following a postulated glacial cycle and provides a comparison with the unconditional clearance levels. The results appear in Table 10.5.1-1 of the Draft EIS [1].

The comparison with unconditional clearance levels should be expanded to include all pathways where humans could be exposed, for example, through natural weathering or normal human activities such as road or building construction, farming, etc.

3.1.4 Inadequate Assessment of the Normal Evolution Scenario

As noted in Canadian and international guidance [7, 9], the normal evolution scenario should be based on reasonable extrapolation of present day site features and receptor lifestyles. It should include expected evolution of the site and degradation of the waste disposal system (gradual or total loss of barrier function) as it ages.

Currently, the Draft EIS [1] considers future on-site human habitation and facility degradation under Section 7.0 *Accidents and Malfunctions.* This is inappropriate, since they should be considered as part of the normal evolution scenario.

The material contained in the proposed facility will remain hazardous for thousands of years, which is far longer than the expected life of the proposed facility, its cover, and the grout.

The normal evolution scenario should include the effects of the degradation of the proposed facility, including the direct transfer of the hazardous material to the accessible biosphere.

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5 Canadian Nuclear Safety Commission.

Similarly, the normal evolution scenario should include a critical group of on-site residents consuming well-water as this is a reasonable extrapolation of the present (see Section 3.1.1 of these comments).

The hazards associated with the normal evolution scenario should be assessed against extant Canadian criteria [7, 22, 23].

3.2 Noncompliance with Canadian Environmental Assessment Act, 2012 [24]

In responding to comments on the Project Description [25], CNSC Staff state [26]:

> As outlined in subsection 4.2 (Alternative means of carrying out the project) of the Guidelines [27],[4] CNSC staff require that the proponent's EIS assess all potential environmental effects of the proposed in situ decommissioning approach and of each alternative mean of carrying out the project.

The Draft EIS [1] provides only a subjective, qualitative evaluation of each of the proposed alternative means. For example, no dose estimates to workers, public, or non-human biota are provided for each of the alternative means. Similarly, no quantitative evaluation is provided on the non-radiological impact to humans or non-human biota for each of the alternative means. Hence, the authors have failed to adequately address the requirements of CNSC Staff with respect to the Canadian Environmental Assessment Act, 2012.

To give credibility to their choice of preferred means (entombment), the authors should provide a quantitative assessment of the impact of each alternative means on valued components [24, 27], including human health.

3.3 Radiological Exposures in Excess of Canadian Criteria

The Draft EIS [1] shows that, without perpetual institutional control, realistically characterized anticipated normal human behaviour (farming, construction, etc.) would result in doses in excess of the Canadian unconditional clearance level (10 µSv/a) [23], dose constraint (0.3 mSv/year) [7], and public dose limit (1.0 mSv/year) [22]. Hence, this proposal is noncompliant with the Canadian Nuclear Safety Commission's Regulatory Policy P-290, *Managing Radioactive Waste* [28], which states that the predicted impacts from the management of radioactive waste must be no greater than the impacts that are permissible in Canada today.

3.4 Noncompliance with International Requirements & Treaty Obligations

CNSC Policy P-290 [28] states that is is policy of the CNSC to consult and cooperate with provincial, national and international agencies to:

- Promote harmonized regulation and consistent national and international standards for the management of radioactive waste; and
- Achieve conformity with the measures of control and international obligations to which Canada has agreed concerning radioactive waste.

The proposed facility [1] is in noncompliance with international requirements and guidance, for example:

- Entombment is not acceptable as a decommissioning strategy [2];
- Near surface disposal is not acceptable for intermediate level waste [8]; and
- Perpetual institutional control is not acceptable [6 – 10, 13].

Following Canada's ratification, the *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management* [29] entered into force with respect to Canada in 2001. Canada has been an active participant since that time.

With respect to the safety of radioactive waste management, the Joint Convention [29] has *General Safety Requirements* and requirements for *Siting, Design and Construction, Assessment, Operation,* and *Institutional Measures after Closure* in articles 11, 13, 14, 15, 16, and 17, respectively. For example, the Joint Convention [29] requires Canada (as a Contracting Party) to take appropriate steps to:

- provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;
- strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;
- aim to avoid imposing undue burdens on future generations.

The proposal in the Draft EIS [1] is incompatible with Canada meeting these obligations, since, for example:

- It fails to meet international standards and criteria with respect to:
    - Decommissioning strategy [2];
    - Disposal of intermediate level waste [8];
    - Institutional control [6 – 10, 13];
- It imposes reasonably predictable impacts on future generations greater than those permitted for the current generation (see previous sections of these comments); and
- It imposes undue burdens on future generations (see Section 4 of these comments).

4.0 On-Going Liability for Canada

To provide assurance of long-term safety, the proposal described in the Draft EIS [1] requires institutional controls to remain in place in perpetuity. As noted previously, the concept of perpetual active institutional controls is contrary to both Canadian and international guidance [6 – 10, 13], which notes that active institutional controls can be relied upon for only a limited period of time (up to a few hundred years).

The use of institutional controls for an extended period would impose an undue burden on future generations, since it would require on-going expenditures without tangible benefit.

Without perpetual institutional control, realistically characterized anticipated normal human behaviour (farming, construction, etc.) would result in unacceptable radiological exposures to future residents. Remediation would be required to prevent these unacceptable exposures, incurring additional future radiological and financial burdens.

These additional future radiological and financial costs incur an on-going liability for Canada and its people.

5.0 Concluding Remarks

The Draft EIS [1] and the associated project proposal contain numerous deficiencies. For example,

a) The proposal employs inadequate technology;

b) The proposal does not meet regulatory requirements with respect to the health and safety of persons and the protection of the environment; and

c) The proposal creates an on-going liability for Canada.

The extent and gravity of these deficiencies preclude a conclusion that the project is unlikely to cause significant adverse environmental effects, taking into consideration the implementation of mitigation measures.

6.0 References

[1] Canadian Nuclear Laboratories, *Environmental Impact Statement: In Situ Decommissioning of WR-1 at the Whiteshell Laboratories Site, WLDP*-26000-ENA-001, Revision 1, 2017 September 13.
[2] International Atomic Energy Agency, *Decommissioning of Facilities,* General Safety Requirements Part 6, GSR Part 6, 2014.
[3] US Nuclear Regulatory Commission, *Regulatory Improvements for Power Reactors Transitioning to Decommissioning*, Regulatory Basis Document, NRC-2015-0070, 3150-AJ59, 2017 November.
[4] Canadian Nuclear Laboratories, *In Situ Decommissioning of Whiteshell Reactor 1 Project Decommissioning Safety Assessment Report*, WLDP-26000-SAR-001, 2017 September.

[5] Atomic Energy of Canada Limited, *Whiteshell Laboratories Decommissioning Project Comprehensive Study Report*, WLDP-03702-041-000, Revision 2, 2001.

[6] International Atomic Energy Agency, *Disposal of Radioactive Waste,* Specific Safety Requirements SSR-5, 2011.

[7] Canadian Nuclear Safety Commission, *Assessing the Long Term Safety of Radioactive Waste Management,* G-320, 2006.

[8] International Atomic Energy Agency, *Classification of Radioactive Waste,* General Safety Guide GSG-1, 2009.

[9] International Atomic Energy Agency, *The Safety Case and Safety Assessment for the Disposal of Radioactive Waste,* Specific Safety Guide SSG-23, 2012.

[10] International Atomic Energy Agency, *Near Surface Disposal Facilities for Radioactive Waste,* Specific Safety Guide SSG-29, 2014.

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[12] US Department of Energy, *DOE EM Project Experience & Lessons Learned for In Situ Decommissioning,* EM-13, US Department of Energy, 2013.

[13] Canadian Standards Association, *Decommissioning of Facilities Containing Nuclear Substances,* N294-09 (R2014), 2009.

[14] Ontario Power Generation, *OPG's Deep Geologic Repository Project for Low and Intermediate Level Waste,* Environmental Impact Statement, Main Report, 00216-REP-07701-00001 R000, 2011 March.

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[18] International Commission on Radiological Protection, *ICRP Publication 81: Radiation Protection Recommendations as Applied to the Disposal of Long-lived Solid Radioactive Waste*, 2000.

[19] Canadian Nuclear Laboratories, *Derived Release Limits For AECL's Whiteshell Laboratories,* WL-509211-RRD-001, Revision 3, 2016.

[20] Canadian Standards Association, *Environmental Risk Assessments At Class 1 Nuclear Facilities And Uranium Mines And Mills,* N288.6 (R2017), 2012.

[21] International Commission on Radiological Protection, *ICRP Publication 60: The 1990 Recommendations of the International Commission on Radiological Protection, 1991*.

[22] Canada, *Radiation Protection Regulations,* SOR/2000-203.

[23] Canada, *Nuclear Substances and Radiation Devices Regulations,* SOR/2000-207.

[24] Canadian Environmental Assessment Act, 2012, (S.C. 2012, c. 19, s. 52, 2012.)

[25] Canadian Nuclear Laboratories, *In Situ Decommissioning of the WR-1 Reactor at the Whiteshell Laboratories Site*, WLDP-03700-ENA-001, Revision 0, 2016.

[26] Canadian Nuclear Safety Commission, Disposition Table of Public and Aboriginal Groups' Comments on Project Description – In Situ Decommissioning of Whiteshell Reactor #1 Project, Canadian Environmental Assessment Registry, Project 80124, 2017 March 08.

[27] Canadian Nuclear Safety Commission, *Generic Guidelines for the Preparation of an Environmental Impact Statement pursuant to the Canadian Environmental Assessment Act, 2012,* 2016.

[28] Canadian Nuclear Safety Commission, *Managing Radioactive Waste*, Regulatory Policy P-290, 2004.

[29] International Atomic Energy Agency, *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*, International Law Series No. 1, 2006.