Date: November 25, 2017

From: W. Turner

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

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

Subject line: Submission with respect to the WR-1 entombment project

CEAA Reference number: 80122

Comments:

Dear Ms. Cianci

In accordance with the CNSC's Public Notice of October 5, 2017, attached are my comments on my preliminary review of CNL's draft report, *Environmental Impact Statement In Situ Decommissioning of WR-1 at the Whiteshell Laboratories Site*, WLDP-26000-ENA-001, Rev 1, 2017 September 13 (CNSC Reference Number 120753E). This review focused on two issues.

- Did CNL address the public's comments on the Project Description?
- Did CNL's draft report address the CNSC's Regulatory Policy, Managing Radioactive Waste, P-290?

As I point out in the attachment, the answer to both questions is "No"

In my review, I also identified a significant issue with respect to "Institutional Control" (see item 2 in the attached table). The question raised is:

- "Is the CNSC prepared to approve "land use restrictions" on the Whiteshell site in perpetuity?"

I am submitting these comments relatively early in the review process because this process must be put on hold. All the issues I raise in the attachment with respect to this draft report should have been addressed by CNL before they submitted their report for public review. Because the report starts off by being flawed, completing a more detailed review of the report is a waste of time. It should not be the role of the public to point out its deficiencies.

Please instruct CNL to withdraw this report and provide a revised report that addresses both CNSC's dispositions to the comments on the Project Description and the provisions of CNSC's Regulatory Policy, P-290. Until these two issues are addressed, this process must be put on hold.

When the revised report is issued for public review, I will submit further comments.

Regards

W. Turner (former Pinawa resident, and AECL retiree)

Comments on Revision 1 of the draft EIS for the
"In Situ Decommissioning of the WR-1 Reactor at the Whiteshell Laboratories Site"
(Registry Number 80124)

By W. Turner (Former Pinawa Resident, and AECL Retiree)

1. Introduction

I have now had a chance to complete a preliminary review of CNL's draft EIS report on the "*In Situ Decommissioning of the WR-1 Reactor"* ([1]). The scope of this initial review was to compare the draft report with:

- CNSC's dispositions ([2]) to the comments submitted on CNL's Project Description ([3]) to determine whether those dispositions had been addressed, and
- CNSC's Regulatory Policy, *Managing Radioactive Waste*, P-290 ([4]),

The details of this evaluation are presented below. To summarize, CNL's draft EIS report fails to address both the CNSC dispositions, and the policy provisions of P-290. As such, the report does not fulfill the requirements of the Section 19(1)(c) of CEAA which states:

> *19 (1) The environmental assessment of a designated project must take into account the following factors: …*
> *(c) comments from the public … that are received in accordance with this Act ...*([5])

Nor does the report provide the information required under the CNSC policy, P-290

Therefore, I request that the CNSC instruct CNL to withdraw this report and stipulate that CNL submit a revised report that adequately addresses both the requirements of the CEAA and of the CNSC policy.

2. Addressing CNSC Dispositions to Public Comments on the Project Description

In their dispositions to several of the comments on CNL's project description, the CNSC stated that:

> *Detailed information on … [*the substance of the comment*] … will be …* ***summarized in sufficient detail in the EIS*** *… Sufficient information is required for CNSC staff to make scientifically defensible recommendations which inform evidence-based Commission decisions*. [emphasis added] ([2])

I therefore searched for instances where CNL's EIS report provided the *"… sufficient detail …"* as required by the CNSC dispositions.

Table 1 compares the CNSC's "*Disposition Table of Public and Aboriginal Groups' Comments on Project Description – In Situ Decommissioning of Whiteshell Reactor #1 Project*" ([2]) with what was found in the draft EIS for the project ([1]). The examples were chosen to demonstrate that the draft EIS does not address all the comments included in the public submissions on the project description included on the CEAA Registry. Although the examples selected are from my submission ([6]), other submissions raised essentially identical issues to which the CNSC provided the same response.

As outlined in Table 1, CNL's draft EIS for the entombment of the Whiteshell reactor does not address CNSC's dispositions to the comments received on their Project Description document.

3. Addressing CNSC Regulatory Policy, P-290

In addition, I compared the EIS report with Regulatory Policy, *Managing Radioactive Waste*, P-290 ([4]), since CNL specifically stated:

> *The P-290 guidance document describes the philosophy that underlies the CNSC's approach to regulating the management of radioactive waste and the principles that are taken into account when making regulatory decisions on waste management. CNL considered these CNSC's guidance documents in the design and safety case development of the Project.* (See Reference 1, Page 2-6)

To quote from the CNSC Regulatory Policy, *Managing Radioactive Waste*, P-290 ([4]).

> *5.0 POLICY STATEMENT*
>
> *When making regulatory decisions concerning the management of radioactive waste, it is the policy of the Canadian Nuclear Safety Commission to consider the extent to which the owners of the waste have addressed the following principles:*
>
> *a) The generation of radioactive waste is minimized to the extent practicable by the implementation of design measures, operating procedures and decommissioning practices;*
> ***b) The management of radioactive waste is commensurate with its radiological, chemical and biological hazard to the health and safety of persons and the environment and to national security;***
> ***c) The assessment of future impacts of radioactive waste on the health and safety of persons and the environment encompasses the period of time when the maximum impact is predicted to occur;***
> ***d) The predicted impacts on the health and safety of persons and the environment from the management of radioactive waste are no greater than the impacts that are permissible in Canada at the time of the regulatory decision****;*
> *e) The measures needed to prevent unreasonable risk to present and to future generations from the hazards of radioactive waste are developed, funded and implemented as soon as reasonably practicable; and*
> *f) The trans-border effects on the health and safety of persons and the environment that could result from the management of radioactive waste in Canada are not greater than the effects experienced in Canada.*
>
> *It is also the policy of the CNSC to consult and cooperate with provincial, national and international agencies to:*
>
> ***g) Promote harmonized regulation and consistent national and international standards for the management of radioactive waste****; and*
> *h) Achieve conformity with the measures of control and international obligations to which Canada has agreed concerning radioactive waste.*

Where is the evidence that CNL "… *considered these CNSC's guidance documents in the design … of the Project*" in their draft EIS report?

To answer this question, one must consider whether CNL's draft EIS report ([1]) addresses each of the four highlighted bullets from P-290 quoted above.

First - With respect to item "b)", since there is little information in the draft EIS about the *"… radiological, chemical and biological hazard*[s] …" in the wastes and structures to be entombed, it is impossible to determine whether the proposed undertaking will be "commensurate" with its hazards.

> **Note:** Even without that information, two IAEA guidance documents (both of which are not referenced in CNL's draft report) recommend that the entombment option is not "commensurate" with these hazards. These two documents are:
>
> - IAEA, *Decommissioning Strategies For Facilities Using Radioactive Material*, Safety Report Series #50, IAEA, Vienna, 2007
> - IAEA, *Decommissioning of Facilities*, General Safety Requirements Part 6, IAEA, Vienna, 2014

Second - With respect to item "c)", since there is little information about the *"… radiological, chemical and biological hazard*[s] …" it is extremely difficult to assess future impacts. Not only that, without that information, *"… the period of time when the maximum impact is predicted to occur …*" cannot be determined.

Third – With respect to item "d)", again the lack of information about the *"… radiological, chemical and biological hazard*[s] …" makes it impossible to ensure that "*The predicted impacts on the health and safety of persons and the environment from the management of radioactive waste are no greater than the impacts that are permissible in Canada at the time of the regulatory decision*".

Fourth – With respect to item "g)", it is not clear to which of the *"… international standards for the management of radioactive wastes*" this policy principle refers. However, since Canada is a member state of the IAEA, one can only conclude the IAEA guidance documents are included. As has been pointed out by several reviewers who

provided submissions on the project description, CNL has failed to address several of these IAEA standards. At the risk of being repetitive, specifically the two most relevant ones are:

- IAEA, *Decommissioning Strategies For Facilities Using Radioactive Material*, Safety Report Series #50, IAEA, Vienna, 2007
- IAEA, *Decommissioning of Facilities*, General Safety Requirements Part 6, IAEA, Vienna, 2014

In summary, CNL's draft EIS provides no evidence that "*CNL considered these CNSC's guidance documents* [i.e. P-290] *in the design and safety case development of the Project*". (See Reference 1, Page 2-6)

4. Conclusion

Although this evaluation against these two requirements is not exhaustive, it is indicative of a massive failure on the part of CNL. If they cannot consider and address the relatively simple requirements as outlined above, it is questionable that the report itself addresses the other legislative and guidance as required under CEAA and the *Nuclear Safety and Control Act*.

Since CNL's draft EIS does not address either the CNSC's dispositions to comments received on their project description, or the policy provisions of CNSC's Regulatory Policy, the CNSC must direct CNL to withdraw their current draft and resubmit a document that addresses both the CNSC dispositions ([2]) and P-290 ([4]).

This request is similar to the one made in my original submission on the Project Description. To quote

> *The main arguments presented …* [in this submission] … *are:*
>
> - *The proposed strategy of entombment (in situ decommissioning) for WR-1 is not acceptable based on international guidance.*
> - *The decision about the long-term future of the reactor site are being made without proper public engagement contributing to the perception that CNL is the sole decision maker. This is inexcusable*
> - *…*
> - *The nuclear liability will never be reduced, and the Government of Canada will never be released from that liability.*
>
> *Until these are resolved, CNL should withdraw this proposal…* ([6])

Please instruct CNL to withdraw this report and provide a revised report that addresses both CNSC's dispositions to the comments on the Project Description ([2]) and the provisions of CNSC's Regulatory Policy, P-290 ([4]). Until these two issues are addressed, this process must be put on hold.

5. References

(1) CNL, *Environmental Impact Statement In Situ Decommissioning of WR-1 at the Whiteshell Laboratories Site*, WLDP-26000-ENA-001, Rev 1, 2017 September 13 (CNSC Reference Number 120753E)

(2) CNSC, *Disposition Table of Public and Aboriginal Groups' Comments on Project Description – In Situ Decommissioning of Whiteshell Reactor #1 Project*, (CNSC Reference Number, 118863E)

(3) CNL, *Project Description, In Situ Decommissioning of the WR-1 Reactor at the Whiteshell Laboratories Site*, WLDP-03700-ENA-001, Revision 0, 2016 April (CNSC Reference number, 118863E)

(4) CNSC, *Regulatory Policy, Managing Radioactive Waste*, P-290, July 2004

(5) Government of Canada, *Canadian Environmental Assessment Act, 2012*, S.C. 2012, c. 19, s. 52

(6) William Turner to the Canadian Nuclear Safety Commission re*: Comments on the project description for the In Situ Decommissioning of the Whiteshell Reactor #1 Project*. (CNSC Reference Number, 114854E)

Comments on Revision 1 of the draft EIS for the
"In Situ Decommissioning of the WR-1 Reactor at the Whiteshell Laboratories Site"
(Registry Number 80124)

Table 1: Comparison of the draft EIS with CNSC Dispositions to Comments on the Project Description

	Comment Number (See Ref 2)	***My Comment on the Project Description (See Ref 6)***	***CNSC Response (See Ref 2)***	***Comments on the Draft EIS (See also Ref 1)***
1.	WT-4	4. Is entombment an acceptable decommissioning strategy for nuclear reactors? Let's look at another section of the IAEA document *Decommissioning Strategies For Facilities Using Radioactive Material*, Safety Report Series #50, IAEA, Vienna, 2007 pertaining to the acceptability of entombment as a decommissioning strategy. Section 3.2.3. *Entombment*, states: ***Entombment is not relevant for a facility that contains long lived isotopes because these materials are not suitable for long term surface disposal****. Consequently, reprocessing facilities, fuel fabrication facilities, enrichment facilities or facilities that use or process thorium or uranium would not be appropriate for entombment. However, entombment could be a viable option for other nuclear facilities containing only short lived or limited concentrations of long-lived radionuclides, i.e. in order to comply with the site release criteria. [emphasis added].* Although the proponent does not provide inventories of any of the possible long-lived radionuclides remaining in the reactor and its associated structures, there is no doubt that they are there.	*Yes, the document referenced, IAEA GSR 6, indicates that entombment is not recognized internationally, in principle, as a preferred decommissioning strategy (entombment may be considered a solution only under exceptional circumstances, such as following a severe accident). …* *Irrespective of the IAEA guidance document, under the CNSC's regulatory framework, applicants are responsible for selecting and justifying their proposed decommissioning strategy. …* *Consideration will be given to international guidance and best practice.* *Information on the long-term safety of the proposed project will be summarized in the EIS and the safety case*	Although there are no "regulatory" requirements to follow IAEA guidelines, these documents are internationally recognized as setting a minimum for determining "best practice". Further, Canada is a member state of the IAEA. As such, the EIS must provide justification as to why international best practice does not apply to this project. While the authors of the EIS refer to several IAEA guidance documents to support their proposal, the two IAEA documents that address entombment as a decommissioning strategy are ignored. These two IAEA documents are: • *IAEA, Decommissioning Strategies For Facilities Using Radioactive Material, Safety Report Series #50, IAEA, Vienna, 2007* • *IAEA, Decommissioning of Facilities, General Safety Requirements Part 6, IAEA, Vienna, 2014*

Table 1: Comparison of the draft EIS with CNSC Dispositions to Comments on the Project Description

	Comment Number (See Ref 2)	*My Comment on the Project Description (See Ref 6)*	*CNSC Response (See Ref 2)*	*Comments on the Draft EIS (See also Ref 1)*
2.	WT-6	6. Should CNL be the Proponent? "If the timeline, for the radioactivity to decay to acceptable levels, is thousands of years into the future (which is likely given that radioactive nuclides present have half-lives that are in this range or greater) institutional controls will be required to cover this time period. The 2nd paragraph on page 7-2 states: *The WR-1 Reactor site will be returned to AECL for Institutional Control.*"	*Institutional control* *With respect to institutional control, CNSC staff require that information regarding the lifecycle of the project, including the form, length, and requirements of the institutional control period and post-closure monitoring activities, be addressed in the proponent's licensing documentation and summarized in sufficient detail in the EIS and the safety case. The length of institutional control will need to be approved by the Commission.*	To quote from the EIS, *Land tenure considers the uses, allocations, and ownership of lands in proximity to the Project, including the WL site itself. The change in decommissioning for WR-1 Building will change the proportion of the WL site available for future land tenure by private or public entities. The use of ISD may also change the perceived suitability of land use surrounding the WL site.* [see Page 6-8 of the EIS] Any restrictions to land use will require institutional control of some sort. The draft EIS confuses "land use restrictions" and "institutional control". In some instances, CNL states that the IC will last 300 years, but then land use restrictions will last indefinitely. Is the CNSC prepared to approve "land use restrictions" on the Whiteshell site in perpetuity?

Table 1: Comparison of the draft EIS with CNSC Dispositions to Comments on the Project Description

	Comment Number (See Ref 2)	***My Comment on the Project Description (See Ref 6)***	***CNSC Response (See Ref 2)***	***Comments on the Draft EIS (See also Ref 1)***
3.	WT-13	"(3) In Figures 5 and 6 the structure to be entombed contains many pipes, cavities, and structures. From the complexity of the reactor depicted in these two figures, I would expect that the viscosity of the grout would have to approach that of water to ensure that all cavities, pipes, rooms, etc. are completely filled with little or no hollows left behind. As far as I am aware, cement (or grout) is considerably more viscous than water. Thus it appears that these spaces will remain in the entombed structure thus leading to its ultimate failure over time. What assurance can the proponent provide that the grout will fill all the cavities and provide an adequate seal to the existing walls (pipes, and structures) such that water infiltration will not occur over the whole life of the project (including any institutional control phase)?"	*Detailed information on the grouting method, design and longevity of the containment structure, will be provided in the long-term safety analysis and summarized in sufficient detail in the EIS and the safety case. Sufficient information is required for CNSC staff to make scientifically defensible recommendations which inform evidence-based Commission decisions.*	The draft EIS does not provide any summary of *"… information on the grouting method, design or longevity of the containment structure …"*

Table 1: Comparison of the draft EIS with CNSC Dispositions to Comments on the Project Description

	Comment Number (See Ref 2)	*My Comment on the Project Description (See Ref 6)*	*CNSC Response (See Ref 2)*	*Comments on the Draft EIS (See also Ref 1)*
4.	WT-17	Section 3.5.1 Preparation for In Situ Decommissioning "Clause 9 of prescribed Information for the Description of a Designated Project Regulations SOR/2012-148, states that the project information must include: *A description of all activities to be performed in relation to the project.* If figures 5 & 6 are an indication of the current configuration of the reactor building (I see nothing in the description of the current status to indicate otherwise), I'd expect there to be significant work required to remove, dismantle, demolish, cut or otherwise modify the interior of this structure in preparation for the grouting. Please include a description of all preparation activities."	*As outlined in section 4.3 (Scope of project) of the Guidelines, CNSC staff require that the proponent describe and assess in the EIS the potential environmental effects for all phases of the project and their associated activities, including preparation activities. Sufficient information is required for CNSC staff to make scientifically defensible recommendations to inform evidence-based Commission decisions.*	Descriptions of the activities associated with the following are missing. • the construction and operation of the grouting facility, • the preparation of the grout itself (i.e. off-site, on-site, transport, secondary wastes from preparation, etc.) • the performance requirements for the grout, • the quality checks for the grout, Since there are no descriptions, assessments of the potential environmental impacts of these activities are not possible.

Table 1: Comparison of the draft EIS with CNSC Dispositions to Comments on the Project Description

	Comment Number (See Ref 2)	*My Comment on the Project Description (See Ref 6)*	*CNSC Response (See Ref 2)*	*Comments on the Draft EIS (See also Ref 1)*
5.	WT-23	Section 3.3.2.1 Radiological Hazards "The following is a table that provides half-life of each of the nuclides identified in this section. It is sorted by half-life. Also included is the percent of total activity from the text. A cursory look at this table would suggest that within a few hundred years, the activity from these short lived nuclides would present no safety issues. [Table, see submission p.11] It is unlikely this listing is exhaustive since there are no longlived nuclides included. Therefore, a prediction as to when the entombed site will reach the clearance criteria for abandonment cannot be done. The proponent will have to develop a more exhaustive listing of nuclides in order to comply with the CNSC guidance document, G-320."	*A comprehensive list of radionuclides will be identified in the proponent's safety case and presented in sufficient detail in the EIS. Sufficient information is required for CNSC staff to make scientifically defensible recommendations which inform evidence-based Commission decisions.*	No comprehensive list of radionuclides is included in the draft EIS. Without a description of the "source terms", it is impossible to evaluate any potential impacts to the environment, health and safety of persons, both short-term and long-term (essentially in perpetuity). I note that the EIS includes references to other documents in which this information could be found. However, the report itself must be evaluated as a stand-alone document. All information essential to the environmental assessment must be included.
6.	WT-24	Section 3.3.2.2 Non Radiological Hazards "I note that the primary heat transport system contains residual organic coolant. Will this residual coolant be removed from the system before entombment? If not, what are the implications for the entombment process? If it is removed, how will these wastes be managed?"	*CNSC staff require that information regarding nonradiological hazards, be addressed in the proponent's EIS, in sufficient detail. Sufficient information is required for CNSC staff to make scientifically defensible recommendations which inform evidence-based Commission decisions.*	I note that in the draft EIS, the term "residual coolant" occurs once. To quote from Page 3-17 of the EIS report, *Other hazards include asbestos insulating materials, residual organic coolant in piping and tanks, and building structures and service systems. Administrative controls are in place to restrict access to these areas.* In other words, the EIS does not address these concerns.