

Date: Feb 09, 2018

From: W. Turner

To: Lucia Abellan, Environmental Assessment Officer
Canadian Nuclear Safety Commission

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

Subject line: Supplementary Submission with respect to the NPD Closure Project.

CEAA Reference number: 80121

Comments:

Dear Ms. Abellan:

Attached are my additional comments from a more detailed review of CNL's draft report, Environmental Impact Statement Nuclear Power Demonstration Closure Project, 64-808760-ENA-004, 2017 September (CNSC Reference Number 121057E).

Since neither the proponent (CNL) nor the authors (Arcadis) addressed the comments on the Project Description for this project (the subject of my previous submission), I have decided to provide more detailed comments. These are attached

If CNL had withdrawn their original draft and addressed the comments as recommended in my previous submission, the draft EIS would not suffer from most of the deficiencies I identified in this review. The following list is some of the deficiencies I identify in my more comprehensive review. This list is not complete. More details for each of these and several others are provided in the attachment.

The draft EIS must be withdrawn to address the following deficiencies (among several others discussed in the attachment). The authors need to

- provide an appropriate evaluation of alternative means,
- acknowledge that entombment will never be free of adverse environmental impacts (that is, the site can never be abandoned and Institutional Controls will be required in perpetuity),
- address that both public and Aboriginal engagement as more than just a one-way "announcement" process (engagement is a two way process),
- address the requirements of the EA process and remove any confusion and conflation of the ERA, and PA processes,
- remove the considerable amount of irrelevant and extraneous information, that makes the review of the draft difficult and time consuming (there are over 3,100 pages in the document including all the various TSDs. That total does not include the actual references listed in Section 13 of the report), and
- follow simple document QA

If the proponent wishes to proceed with this undertaking, then this document requires a total rewrite. I request the opportunity to review the final EIS before the CNSC produces their EA report.

Thank you for the opportunity to review this draft report.

If you have any questions, or wish to discuss, please contact me.

Regards

W. Turner

**Comments on draft EIS for “Nuclear Power Demonstration Closure Project”
(Registry Number 80121)**

By W. Turner (AECL Retiree)

#	Page	Section	EIS Quote or Reference	Comment/Question
1.		General	Document Number discrepancy	<p>On the title page of the EIS report, the document number is “64-508760-ENA-004”. On the signature page, the document number is “64-509200-ENA-004”.</p> <p>Please clarify. How is one supposed to refer to this report when there are two numbers assigned to a single document?</p> <p>NOTE: A small discrepancy such as this is not a good indication that the rest of the document meets simple quality criteria. As discussed below, this observation was confirmed. The quality of the document is questionable.</p>
2.		General	Sign-off on the EIS documents compared to Figure 3.4-1. Project Team Roles and Organization	<p>Of the three CNL waste disposal projects, I note that the EIS documentation for the NPD Closure Project is the first that includes a sign-off “<i>Accepted by ...</i>” While this demonstrates an appropriate document control process, it raises a question. On the part of CNL, who is ultimately responsible for the content of those documents?</p> <p>According to Figure 3.4-1 (Page 3-14), the person occupying the role of “NPD Closure Project General Manager” should have that responsibility. However, the cover of the EIS report is “Accepted” by a person not identified anywhere in Figure 3.4-1. The next page (the signature page), the report’s “Acceptor” is the NPDWF Facility Authority, not the “NPD Closure Project General Manager”.</p> <p>Most of the Technical Supporting Documents are “<i>Accepted by ...</i>” this same person. However, this role is at the same level as the “Director Engineering” and “Director Project Controls & Contracts” (see Figure 3.4-1).</p> <p>NOTE: the only document that I could find that included the signature of the “Head of NPD Closure Project” as the “Approver” is the project organization document [1] (see also Comment 23 below).</p> <p>Although the issue of signatures could be considered a minor issue, this is one more indication that the documentation for this project does not meet simple quality criteria (see Comment 1 above). It also raises questions as to whether CNL is appropriately discharging its project oversight responsibilities at the appropriate organizational level.</p> <p>As an undertaking that has considerable potential for long-term commitments on the part of CNL, AECL, and/or the Government of Canada, it is not appropriate for a lower tier person to sign-off on these documents that assign long-term responsibilities to AECL and/or the Government of Canada.</p>

[1] J. Ingram, *NPD Closure Project Organization*. 64-514100-ORG-001, CNL, May 2017

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3.	General	<p>Even though in my comments [2] on the NPD project description document [3] I provided a quotation from the IAEA publication, <i>Decommissioning of Facilities</i>, GSR part 6 [4], the authors have chosen to ignore that guidance.</p>	<p>The IAEA identifies three decommissioning strategies for nuclear facilities [4]. These are immediate dismantling, deferred dismantling and entombment. With respect to permanently shutdown reactors, the Agency does not recommend entombment. To quote the sections 1.9 and 1.10 from reference [4]:</p> <p><i>1.9. Strategies for decommissioning that have been adopted or are being considered by States include immediate dismantling and deferred dismantling. In principle, these two possible decommissioning strategies are applicable for all facilities.</i></p> <p>— <i>Immediate dismantling: In this case, decommissioning actions begin shortly after the permanent shutdown. Equipment and structures, systems and components of a facility containing radioactive material are removed and/or decontaminated to a level that permits the facility to be released from regulatory control for unrestricted use, or released with restrictions on its future use.</i></p> <p>— <i>Deferred dismantling: In this case, after removal of the nuclear fuel from the facility (for nuclear installations), all or part of a facility containing radioactive material is either processed or placed in such a condition that it can be put in safe storage and the facility maintained until it is subsequently decontaminated and/or dismantled. Deferred dismantling may involve early dismantling of some parts of the facility and early processing of some radioactive material and its removal from the facility, as preparatory steps for the safe storage of the remaining parts of the facility.</i></p> <p><i>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.</i></p> <p><u>Entombment</u>, in which all or part of the facility is encased in a structurally long lived material, is not considered a decommissioning strategy and <u>is not an option in the case of planned permanent shutdown</u>. It may be considered a solution only under exceptional circumstances (e.g. following a severe accident). [emphasis added].</p> <p>Please address this comment, and justify why CNL (and/or the authors) has chosen the entombment option when it is clearly not considered appropriate for the NPD reactor.</p> <p>Note: Addressing this comment by including it in the <i>Alternative Means TSD</i>, Appendix A “<i>International Support for In-Situ Decommissioning as a Decommissioning and Decontamination Option</i>”, is not appropriate for at least two reasons.</p> <p>First – The TSD is NOT cited as a reference in the EIS (i.e. Section 13). As such, it is unlikely that the public will ever see it, unless they make a specific request. Thus, it does not facilitate “<i>meaningful public participation</i>”. (See also Comment 5 below.)</p> <p>Second - The authors of the <i>Alternative Means TSD</i> do not assess the “preferred” option against the caveats and issues identified in the various references cited in this Appendix. In other words, the assessment of “alternative means” discussed in this TSD is incomplete, thus the results are questionable.</p>
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4.		General	<p>The entombment of the NPD will result in a near surface radioactive waste disposal facility. Further, the resulting facility is NOT appropriate for the disposal of the intermediate-level radioactive wastes contained in the NPD systems and components.</p>	<p>The following is a quote from the IAEA document, <i>Decommissioning Strategies For Facilities Using Radioactive Material</i>, Safety Report Series #50, IAEA, Vienna, 2007.</p> <p>2.4. ENTOMBMENT</p> <p><i>Entombment is the strategy in which the radioactive contaminants are encased in a structurally long lasting material until the radioactivity decays to a level that permits release of the facility from regulatory control. The fact that radioactive material will remain on the site means that the facility will eventually become designated as a near surface waste disposal site and criteria for such a facility will need to be met.</i> [emphasis added]</p> <p>Since entombment results in a near surface waste disposal facility, then the radioactive levels in of the wastes entombed must meet those associated with a disposal facility of this type.</p> <p>As the authors admit, this entombed facility will create a disposal facility (see last paragraph on Page 3-8):</p> <p><i>“The project proposes in-situ decommissioning of the NPDWF, which isolates the contaminated systems and components inside the below-grade structure thus creating a waste disposal facility on the NPD site.”</i> [emphasis added]</p> <p>Further, the authors admit that this disposal facility will contain ILW, (see second sentence top paragraph of Page 4-26)</p> <p><i>“... a small volume (~ 125 m³) could be classified as ILW and therefore require the degree of containment and isolation afforded by the reactor vault shielding.</i> [emphasis added]</p> <p>The following is quoted from the IAEA document, "Classification of Radioactive Waste", GSG-1, 2009.</p> <p><i>“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.”</i> [emphasis added]</p> <p>It is precisely because an entombed facility cannot provide this “... degree of containment and isolation ...” that IAEA guidance explicitly states</p> <p><i>“Entombment ... is not an option in the case of planned permanent shutdown.”</i> [4]</p> <p>Given the IAEA guidance summarized above, the criteria used to determine that entombment was the preferred option has omitted a significant evaluation benchmark. The authors must</p>

[2] W. Turner, *Comments on the “Project Description – NPD Closure Project*, (Registry Number 80121) (CNSC Reference Number 114830E)

[3] CNL, *Project Description – NPD Closure Project*, 64-509200-ENA-003, Revision 1, March 31, 2016

[4] IAEA, *Decommissioning of Facilities, General Safety Requirements Part 6*, IAEA, Vienna, 2014.

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				<p>justify why the criteria used for assessing alternative means ignored international guidance and best practice.</p> <p>I suggest that, by ignoring international guidance and best practice, the selection of “entombment” as the preferred option cannot be justified. Therefore, the “real” best option remains unknown.</p>

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5.		General	The inappropriate use of “Technical Supporting Documents” (TSD).	<p>I find it somewhat disturbing that the authors continually refer to documents identified as “Technical Supporting Documents” for more details as to the topic under discussion. Yet, none of these documents is included in the list of references included in Section 13 of the EIS report. The following is one example (out of many) of the issue:</p> <p style="padding-left: 40px;"><i>“See Appendix Q1 of the Stakeholder Engagement TSD.”</i> (Page 6-3 of the EIS)</p> <p>If the authors wish the reader to “<i>See [an] Appendix ... of ... [a] TSD</i>”, then that TSD must be included as part of the EIS report. As a minimum, the TSDs must be include as references in that report.</p> <p>Note: the term “TSD” occurs 364 times in the EIS. Further, the authors state that these TSDs are critical to the understanding of the environmental assessment of the proposed undertaking as described in the draft EIS.</p> <p>Since no TSDs and no references to the TSDs are included in the EIS, it is not clear whether a review of the information contained in these documents is actually within the scope of the review of the EIS report. If they are not within that scope, then the draft EIS report must be considered incomplete.</p> <p>The use of TSDs is an additional impediment to the public’s access to critical information and data with respect to the assessment subject to this review process. By the proponent’s use of TSDs, suggests that they are out of compliance with Section 4 (1)(e) of the CEAA (2012), which states:</p> <p style="padding-left: 40px;"><i>Purposes</i></p> <p style="padding-left: 40px;"><i>4 (1) The purposes of this Act are ...</i></p> <p style="padding-left: 40px;"><i>(e) to ensure that opportunities are provided for meaningful public participation during an environmental assessment; ...</i> [emphasis added]</p> <p>One can only conclude that these omissions are deliberate and as such, they constitute an intentional decision to thwart any meaningful public review of the EIS report.</p> <p>NOTE: If CNL believes that unreferenced documents (such as these TSDs) are within the scope of the review of the EIS, then they must explain why their <i>Integrated Waste Strategy</i> (CW-508600-PLA-002 Rev. 0) document is not. After several requests for a copy of that document, CNL has refused to provide a copy, instead providing a summary only [5]. One wonders what it is that CNL wishes to hide.</p>

[5] The document CNL refuses to provide is, CNL, *CNL Integrated Waste Strategy*, CW-508600-PLA-002 Rev. 0. The reference for the IWS summary is given in footnote [15].

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6.		General	<p>The total number of pages associated with this document and the various TSDs makes it impossible to conduct a reasonable review of this proposed undertaking within the constraints of the relatively short review period.</p>	<p>The following is table that provides the number of pages associated with the draft EIS and all the TSD documents. It is impossible for a reviewer to examine all these documents within the review period. Therefore, the proponents have failed to address one of the purposes of the CEAA, which states:</p> <p><i>Purposes</i></p> <p>4 (1) <i>The purposes of this Act are ...</i></p> <p>(e) <i>to ensure that opportunities are provided for meaningful public participation during an environmental assessment; ...” [emphasis added]</i></p> <table border="1"> <thead> <tr> <th><i>Document</i></th> <th><i>Number of pages</i></th> </tr> </thead> <tbody> <tr> <td>Draft EIS report</td> <td>590</td> </tr> <tr> <td>Aboriginal Engagement TSD</td> <td>264</td> </tr> <tr> <td>Alternative Means Assessment TSD</td> <td>103</td> </tr> <tr> <td>Archaeology TSD</td> <td>62</td> </tr> <tr> <td>Chimney Swift Studies TSD</td> <td>26</td> </tr> <tr> <td>Decommissioning Safety Assessment TSD</td> <td>396</td> </tr> <tr> <td>Ecological Land Classification TSD</td> <td>34</td> </tr> <tr> <td>Ecological Risk Assessment TSD</td> <td>414</td> </tr> <tr> <td>EIS Supplementary Documentation TSD</td> <td>224</td> </tr> <tr> <td>Greenhouse Gas Emissions TSD</td> <td>39</td> </tr> <tr> <td>Postclosure Safety TSD</td> <td>678</td> </tr> <tr> <td>Socio-Economic Assessment TSD</td> <td>51</td> </tr> <tr> <td>Stakeholder Engagement TSD</td> <td>242</td> </tr> <tr> <td>Total Pages</td> <td>3,133</td> </tr> </tbody> </table> <p>See also Comment 5 above.</p>	<i>Document</i>	<i>Number of pages</i>	Draft EIS report	590	Aboriginal Engagement TSD	264	Alternative Means Assessment TSD	103	Archaeology TSD	62	Chimney Swift Studies TSD	26	Decommissioning Safety Assessment TSD	396	Ecological Land Classification TSD	34	Ecological Risk Assessment TSD	414	EIS Supplementary Documentation TSD	224	Greenhouse Gas Emissions TSD	39	Postclosure Safety TSD	678	Socio-Economic Assessment TSD	51	Stakeholder Engagement TSD	242	Total Pages	3,133
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7.		General	The Approver and at least one of the Authors of several TSDs is the same person.	<p>In the following TSDs, the Approver, and at least one of the authors is the same person, Dr. Nava Garisto.</p> <ul style="list-style-type: none"> • <i>Alternative Means Assessment TSD</i> • <i>Decommissioning Safety Assessment TSD</i> • <i>Ecological Risk Assessment TSD</i> • <i>Postclosure Safety Analysis TSD</i> <p>This is a direct conflict with good document quality practice. An approver must be independent of the author. Otherwise, the document is suspect.</p> <p>What is also disconcerting is that Dr. Garisto has a senior role in the consulting firm, Arcadis, that of Vice President, Radioactive Waste Management and Decommissioning. As such, there is the real possibility that any staff member below her rank in the organization will be reluctant to question her conclusions if she is also one of the authors. In other words, the appearance of independence in the production of these documents is lacking.</p> <p>Maybe a conflict of this nature is why these documents are not included as references or in the EIS report itself. One can only speculate.</p> <p>This lack of a quality process raises questions as to the overall “quality” of these documents. Thus the quality of the whole draft EIS report itself is suspect.</p> <p>With respect to ensuring quality documentation, where is CNL, the contract administrator? A representative of CNL signed each of these documents. However, this person seems to have failed to discharge their contract administrator responsibilities to ensure the supporting documents submitted met the basics of good quality.</p> <p>See also Comment 23 below.</p> <p>NOTE: It is not the role of the public to point out the lack of quality control in the documents submitted to the proponent in support of their proposal.</p>

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8.		General	<p>Stakeholder Engagement Technical Supporting Document</p> <p>CNL, <i>Stakeholder Engagement Report - NPD Closure Project</i>, 64-513440-REPT-001, Revision 0. August 30, 2017.</p>	<p>To quote from the Introduction of <i>Stakeholder Engagement TSD</i>:</p> <p>“... Stakeholder engagement is a key element of the Environmental Assessment Process and the purpose of this report is to describe past, ongoing and proposed public and stakeholder engagement activities and events ...”</p> <p>If the proponent truly understood that “<i>Stakeholder engagement is a key element of the Environmental Assessment Process ...</i>” then I would expect to see that this report would include an acknowledgement of the comments received on the Project Description [3] for this project (as a minimum). Yet, nowhere in this TSD can I find any indication where CNL and/or the authors acknowledged the existence of this review and comment step in the EA process. Thus, all these comments received during that review process remain unaddressed. This appears to be a non-compliance with Section 19(1)(c) of CEAA (2012) which states:</p> <p><i>Factors</i></p> <p>19 (1) The environmental assessment of a designated project must take into account the following factors: ...</p> <p>(c) <u>comments from the public</u> — ..., any interested party — <u>that are received in accordance with this Act</u>; [emphasis added.]</p> <p>As pointed out in my previous comments on this EIS [6], by not addressing these comments (as the CNSC expected [7]), when the draft EIS report was released for public comment, it contained serious flaws.</p> <p>In accordance with the section of CEAA (2012) quoted above, the authors must address all public comments, including those concerning the Project Description.[3]</p> <p>NOTE: Ensuring compliance with CEAA (2012) is NOT the responsibility of the public. As the “Responsibility Authority” under the Act, this is the responsibility of the CNSC.</p> <p>However, it appears the CNSC is not addressing their responsibility with respect to this clause of CEAA (2012). Thus, even the CNSC is relying on the public.</p>

[6] W. Turner, *Submission with Respect to the NPD Closure Project*, December 13, 2017, (CNSC Reference Number 121233E).

[7] CNSC, *Disposition Table of Public and Aboriginal Groups’ Comments on Project Description – Nuclear Power Demonstration Closure Project*, (CNSC Reference Number, 118857E)

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9.		General	<p>CNL’s use of the various assessment processes seems confused if not completely inappropriate. Therefore, the conclusions from the application of their chosen evaluation process are pointless. Further, the discussions presented in the EIS (and the TSDs) distracts from what should be the ultimate goal of the project - to reduce the risk at the end of the Institutional Control period to allow unrestricted release of the NPD reactor site.</p>	<p>One definition of risk is “consequence” multiplied by “likelihood”. Applying the formula to CNL’s proposed entombment of the NPD reactor, the “consequence” is any unacceptable exposure to radiation and/or hazardous materials. This leads to the question, what would the likelihood of an exposure be at the end of the Institutional Control (IC) period?</p> <p>By definition, at the end of the IC period, there will no barriers (either active or passive) to prevent intrusion so that the likelihood of an intrusion becomes one. Therefore, the risk is equal to the consequence or an unacceptable exposure.</p> <p>How does one ensure the consequence is acceptable? Easy, ensure that the residual radioactivity at the site at the end of the IC period is below unconditional clearance criteria.</p> <p>We have now completed the required risk assessment and concluded that residual activity must meet unconditional clearance levels. There is a further advantage to this simple approach. The evaluation criteria currently exist, so there is no need to be develop or estimate them.</p> <p>Where can the criteria be found? They are defined in the Schedule 2 of the <i>Nuclear Substances and Radiation Devices Regulations</i> [8].</p> <p>With that requirement out of the way, the environmental assessment process boils down to answering two questions,</p> <ul style="list-style-type: none"> • “Will these unconditional clearance level criteria be met at the end of the IC period?” and • “If not, what mitigation measures are required to ensure conformance to these levels at end of the IC period?” <p>With the results of these simple calculations, the proponent only has to ensure the residual activity at the end of the IC period meets these unconditional clearance criteria. If these criteria are met, then both human health and the biosphere are protected in perpetuity, and the Institutional Controls are no longer required. In that case, we have the proof required to demonstrate that the site can be abandoned safely.</p> <p>How easy is that?</p> <p>Please revise the report and discuss how the proposed undertaking will meet these defined unconditional clearance criteria at the end of the IC period. (See also Comment 13 below.)</p>

[8] See Schedule 2 of the *Nuclear Substances and Radiation Devices Regulations*, SOR/2000 207

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10.		General	<p>The authors have substituted an Ecological Risk Assessment for an Environmental Assessment.</p> <p>This suggests the authors do not understand the difference, or are deliberately trying to mislead.</p>	<p>The use of an Ecological Risk Assessment (ERA) is not appropriate for an evaluation of the risks from a future facility. An ERA is a management tool designed to help managers identify areas of risk in an existing facility that may require immediate action to address. Thus, its focus is on current operations and not on issues that could result from future operations that could extend well into the future. It cannot be used to assess the performance of the components of the entombed system throughout the thousands of years over which the structure’s Integrity must be maintained to ensure minimal risk.</p> <p>The ERA process includes identification of valued components (VCs) that are resident in the area surrounding a current operation. Since the VCs living near a future operation cannot be known, an ERA cannot be done.</p> <p>As the authors should know, an ERA starts with the identification of the Contaminants of Potential Concern (COPC) based on current operations, and the VCs currently resident near that existing facility. These VCs are identified as endpoints for the ERA. Samples are taken at the point of exposure and analysed. The resulting measurements are then compared to benchmark levels, resulting in a relative risk (calculated as the RQ value [9]).</p> <p>In the paragraph above, there is no discussion of the source and/or the performance of the facility. If the RQ value exceeds one, then facility’s management determines whether that risk value requires management action.</p> <p>Notice that the calculation of the RQ value does not include a time variable. Without a temporal component in the calculation, this ERA process cannot be used as a predictor.</p> <p>A Performance Assessment (PA), by definition, includes both the source and the facility itself. It is designed to identify weaknesses and strengths of the various components that function as barriers to the release of the COPCs to the environment. The inclusion of a time component is a critical variable. Thus, by its very nature, a performance assessment is a future oriented process.</p> <p>An Environmental Assessment (EA) is analogous to the PA. While a PA evaluates a fixed design, the EA evaluates a proposed design. Both include the facility (i.e. the source). Both are future oriented. However, the PA has details about that source that an EA cannot have</p> <p>The one crucial difference between the PA and the EA processes is the PA focuses on a physical work (or a design for that facility), whereas the EA focuses on the physical activities associated with the physical work. This latter focus leads to a final design that then becomes the subject of the PA.</p> <p>Consider the EA. This assessment must address the future operations, accidents and malfunctions, effects of the environment on an undertaking (such as, global warming, extreme</p>

[9] RQ = Risk Quotient, which is equal to the concentration of the COPC in the environment at the point of exposure divided by a benchmark concentration

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				<p>weather events, and earthquakes). The results of the evaluation are inputs into the project design such that the need for appropriate mitigation measures are identified. Until the mitigation measures are included in the design, they remain as “proposed”.</p> <p>Only after the design is complete, can a PA be done. This latter assessment provides the required evidence to confirm that the facility will meet its design constraints.</p> <p>For this EIS report, the authors must conduct an appropriate assessment of the potential impacts through the environmental assessment process, and refrain from using the ERA or PA tools inappropriately.</p> <p>Please revise and eliminate all discussions and references to the results of an ERA since the process and results are inappropriate.</p> <p>For examples as to what should be included in a Performance Assessment for an entombed facility, I refer the authors to a document cited as a reference in the EIS for the WR-1 in situ decommissioning project [10]:</p> <p align="center"><i>U.S. Department of Energy. 2013. DOE EM Project Experience & Lessons Learned for In Situ Decommissioning. Prepared By U.S. Department of Energy, Office of Environmental Management, Office of D&D and FE, EM-13. Washington DC: Office of Environmental Management,</i></p> <p>I find it most disturbing that I am compelled to provide the above discussion. The notion that the authors of this document (who represent a reputable consulting company) would require such an explanation is incredible.</p> <p>As any reliable environmental practitioner would know, the three tools, the ERA, the PA and the EA, have very different purposes, and their inappropriate use leads to erroneous (and possibly dangerous) conclusions.</p> <p>NOTE: It is not the role of the public to point out these disparities to the proponent and/or to a reputable consultant.</p>

[10] 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)

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11.		General	Through its Regulatory Policy, P-290, the CNSC has defined the criteria for the residual radioactivity at the site at the end of the Institutional Control Period.	<p>The following quotation is from the CNSC Regulatory Policy, P-290, <i>Managing Radioactive Waste</i> (July 2004)</p> <p><i>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; [emphasis added]</i></p> <p>This quotation implies two questions.</p> <ul style="list-style-type: none"> • When is the regulatory decision being made? <p>The obvious answer is that the regulatory decision is the EA decision. If all goes according to CNL’s plans, that decision will be made within the next few months, essentially “now”.</p> <ul style="list-style-type: none"> • What will the predicted impacts be “now”? <p>Since the authors state, that at the end of the IC period, the site is to be abandoned. Therefore, to comply with the statement in P-290 (quoted above), when access to the site becomes unrestricted, the predicted residual activity must meet unconditional clearance criteria as currently defined in reference [8] (see Comment 9 above).</p> <p>The authors need to demonstrate that the residual activity on the site of the NPD reactor will meet unconditional clearance criteria at the end of the Institutional Control period.</p> <p>See also, CNSC G-320 [11], which states:</p> <p><i>7.4 Assessment Time Frames</i></p> <p><i>There is no time limit associated with the statutory objective to “prevent unreasonable risk, to the environment and to the health and safety of persons.,” (NSCA, 9(a)(i)), or with the principle that the predicted impact 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 (as discussed in CNSC regulatory policy P-290, <i>Managing Radioactive Waste</i>). [emphasis added]</i></p>

[11] CNSC, Regulatory Guide G–320, *Assessing the Long Term Safety of Radioactive Waste Management*, December 2006

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12.		General	<p>CNL is the proponent for two very similar projects (i.e. the entombment of two reactors, WR-1 [10] and this one, NPD). Since the regulatory requirements for the environmental assessment are the same for both, one would expect to see similar assessment reports for the two proposals. Yet, neither the processes used nor the results obtained are similar.</p>	<p>Although the format of the two EIS reports for the two entombment projects are very different, that difference can be partially explained by the use of two different consultants to write the reports. However, as the only proponent, CNL has the responsibility to ensure the two assessments conducted in accordance with the CNSC guidance document [12] would be similar. This is especially true since both this EIS and the one for WR-1 cite this guide as a reference. Further, both document cite the CNSC guidance document G-320 [11] and yet describe very different end-states.</p> <p>An egregious example of this discrepancy is the “Institutional Control Period”. For the WR-1 reactor, the IC period never ends (see Reference [10]). For the NPD reactor, the IC period is 100 years (see Page 1-5 of the NPD EIS report)</p> <p>The residual risks from the decay of the long-lived activation products in both the reactor structures and components of the two reactors are essentially the same.</p> <p>The discrepancy between these two assessments is not acceptable.</p> <p>As the proponent for both undertakings, CNL has the responsibility to ensure consistency. Apparently, CNL is “testing the waters” to see which alternative process will “float”. The one that “floats” becomes the approach for both. <u>THIS IS NOT ACCEPTABLE.</u></p> <p><u>NOTE:</u> It is not the responsibility of the public to point out these discrepancies. Where is the proponent, CNL? Apparently, they have taken no responsibility to ensure consistency between their two very similar proposals.</p>

[12] CNSC. *Generic Guidelines for Preparation of an Environmental Impact Statement*, 64-NOCN-16-0002-E, May 2016.

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13.		General	Assessment Criteria	<p>In accordance with Section 6.0, of G-320 [11], somewhere in the documentation supporting this proposal, I expected to find a discussion of how the authors and/or the proponent developed their acceptance criteria. However, that discussion is missing.</p> <p>To quote from Section 6.0 of G-320</p> <p><u>Acceptance criteria are the numerical values used to judge the results of assessment model calculations.</u> <i>The parameters that are calculated to compare with the acceptance criteria should provide reasonable assurance that the regulatory requirements imposed by the NSCA and its associated regulations, and by other applicable legislation, will be met. Given that the principal regulatory requirements are those that address radiological dose and environmental concentrations, it is expected that these parameters will be used in long term assessments as the primary indicators of safety.</i> [emphasis added]</p> <p>To quote from Technical Supporting Document - <i>Ecological Risk Assessment</i>, Section 2.3 “Assessment and Measurement Endpoints”</p> <p><i>Measurement Endpoints</i></p> <p>Typically, <u>assessment endpoints</u> (such as those outlined above) <u>are qualitative in nature and do not lend themselves to direct measurement or quantification.</u> <i>Therefore, measurement endpoints are outlined, which are measurable or predictable expressions of the assessment endpoint. The values of measurement endpoints are dependent not only upon the species being protected, but also upon the level of protection provided. For example, a measurement endpoint suitable for ensuring reproductive success of a population may not be adequate to ensure the protection of each member of the population.</i> [emphasis added]</p> <p>I regret that I have to point out the discrepancy between these two statements. In G-320 the assessment criteria are numerical (i.e. numerical), whereas the proponent states they are qualitative.</p> <p>Since the authors state that the site will be abandoned at the end of the IC period (see Comment 16 below), the numerical criteria for assessing abandonment are already defined (see Comments 9 and 11 above).</p> <p>Note: G-320 provides guidance on developing criteria for the non-radiological hazardous substances.</p> <p>Without appropriate numerical assessment criteria, the authors cannot demonstrate that the site can be abandoned after the proposed 100-year IC period.</p>

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14.	General	<p>How often do the terms the terms “ILW” and “Intermediate-level waste” occur in the NPD documentation?</p>	<p>To answer this question, I have focused on those documents that address the assessment of the environmental effects.</p> <p>In the draft EIS:</p> <ul style="list-style-type: none"> • The term “ILW” occurs four times, of which only one relates to the wastes to be entombed. • The term “Intermediate Level Waste” also appears twice, both in the Glossary section. <p>In the DecomSA TSD</p> <ul style="list-style-type: none"> • The term “ILW” does not occur. • The term “Intermediate Level Waste” also appears three times, all with respect to three references. The term does not appear in the text. <p>In the EcoRA TSD</p> <ul style="list-style-type: none"> • Neither term, “ILW” nor “Intermediate Level Waste” occurs. <p>In the PostSA TSD</p> <ul style="list-style-type: none"> • The term “ILW” occurs three times, none of which refers to the content of the wastes to be entombed. • The term “intermediate Level Waste” occurs 9 times, of which one refers to the OPG DGR, and the other eight are titles of the references. <p>In the Stakeholder Engagement TSD</p> <ul style="list-style-type: none"> • The term “ILW” occurs twice, one related to a question that appears to be related to the NSDF project. The other occurrence is related to a general discussion regarding a GWMF. • The term “intermediate level waste” occurs 8 times. From Table A-2. WNU Feedback three are the participants’ answers to a question as to their country’s decommissioning or nuclear waste disposal program. The other occurrences of the term do not relate to the wastes that will be entombed by this undertaking. <p>However, as the authors state (see second sentence top paragraph of Page 4-26 of the EIS), some of the wastes to be entombed could be classified as ILW.</p> <p><i>“Based on the activation products within the reactor system, a small volume (~ 125 m³) could be classified as ILW and therefore require the degree of containment and isolation afforded by the reactor vault shielding.” [emphasis added]</i></p> <p>The authors use of this classification is confirmed by an overhead related to the visit of the Municipality of Laurentian Hills (see also Comment 22 below).</p> <p>I note that, subsequent to that Open House, virtually all figures depicting these alternative means do not mention or describe the “red” boxes as “Intermediate Level Radioactive Materials”. I refer to Pages 4-4 through to Page 4-6 of this draft EIS report. In the legend associated with these figures, the authors identify the “red” boxes as “Reactor System and</p>
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				<p>Components”, not as “Intermediate Level Radioactive Materials” as depicted in the copy of the overhead shown in Comment 22 below.</p> <p>One can only conclude that the proponent and/or the authors are deliberately downplaying the potential long-term consequences of the entombment of the NPD reactor that includes “ILW” in order to prove the site can be abandoned at end of the 100-year IC period.</p> <p>The deliberate lessening of the contribution of entombed “ILW” to the long-term safety of the NPD site is NOT acceptable.</p> <p>The authors must discontinue the practice of downplaying obvious hazards. If there are hazards associated with ILW content of the facility, then the authors must provide the appropriate evidence to prove their assertion that any ILW entombed (no matter how small) will not present an undue risk to any “intruder” when the site is abandoned at the end of the IC period.</p> <p>(see also Comment 15 below)</p>
15.	1-5	1 GLOSSARY	<p><i>Intermediate Level Waste</i></p> <p><i>Radioactive solid waste that typically exhibits levels of penetrating radiation sufficient to require shielding during handling and interim storage.</i></p>	<p>This definition is deliberately misleading since it ignores the final step, disposal (the whole reason for their proposal).</p> <p>The following is the IAEA definition:</p> <p><i>Intermediate level waste (ILW)</i></p> <p><i>2.28. Intermediate level waste is defined as waste that contains long lived radionuclides in quantities that need a greater degree of containment and isolation from the biosphere than is provided by near surface disposal.</i> [13] [emphasis added]</p> <p>The difference between the authors’ definition of ILW and that of the IAEA is crucial to an understanding of this assessment. This discrepancy raises a fundamental problem with the whole EIS report. Given the authors’ definition, the results of this assessment are meaningless since they do not address this crucial aspect, ILW is not suitable for disposal in a near surface disposal facility.</p> <p>The authors must revise their report such that the use of the term “Intermediate Level Waste” is consistent with international best practice specifically as it relates to the objective of this project, that is, the disposal of the radioactive materials contained in NPD.</p> <p>It is somewhat surprising that the authors (who represent a reputable consulting company) would be party to providing a questionable definition in the documentation whose primary purpose is to demonstrate the long-term safety of this proposed disposal facility.</p>

[13] IAEA, "Classification of Radioactive Waste", General Safety Guide No. GSG-1, 2009

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16.	1-8	1 GLOSSARY	<p>“Post Institutional controls phase” (PIC)</p> <p><i>“a phase of the NPD closure project which includes abandonment of the site after the cessation of the Institutional Controls phase; it is assumed that no further management and monitoring will take place during this phase.”</i></p>	<p>I find the definition of “Post Institutional controls phase” is somewhat problematic. If the site is abandoned, then there can be no further management or monitoring. The site is abandoned, end of story. There can be no “project” phase once the site is abandoned.</p> <p>See Comments 9 and 11 above. For the site to be abandoned, the residual radioactivity cannot exceed the unconditional clearance criteria [8].</p> <p>Note: The term “Post-Institutional Controls” appears 125 times. The term “PIC” occurs 19 times in the EIS, whereas “abandonment” occurs 6 times.</p> <p>On Page 2-8, the authors state:</p> <ul style="list-style-type: none"> • Post-Institutional Controls, or abandonment of the site following the Institutional Controls phase. <p>Further, on page 9-138, the authors state:</p> <p><i>“During the Institutional Controls and Post-Institutional Controls phases, it is assumed that the licensed area will be abandoned, making the land available for other uses. It is unknown how the licensed area might be redesignated. Changes in land use planning designation are not expected to result in residual effects.”</i></p> <p>These statements are somewhat inconsistent with the definition of PIC given in the Glossary.</p> <p>Consistency in the use of terminology, specifically as it relates to “abandonment of the site” is critical. If this project is approved, then it will result in a “Near Surface Radioactive Waste Disposal Facility” (see Comment 4 above). This inconstancy in terminology use is NOT acceptable.</p> <p>As discussed in Comments 9 and 11 above, the simple solution to this misunderstanding is for the authors to state explicitly that the residual radioactivity at the site when it is abandoned will meet or exceed the unconditional clearance criteria.</p>
17.	2-3	2.2.1 Purpose	<p><i>The purpose of the project is to safely carry out the decommissioning of the NPDWF using the in-situ decommissioning approach to isolate the contaminated systems and components inside the below-grade structure.</i></p>	<p>I note that the purpose of the project as stated here also includes the proposed solution. By conflating the solution with the purpose, all other decommissioning approaches “... to isolate the contaminated systems and components...” are eliminated from consideration.</p> <p>By doing so, the proponent is out of compliance with Section 19(1)(g) of CEAA (2012), that is “alternative means of carrying out the designated project ...”.</p>

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18.	2-5	2.3 Scope of the Environmental Assessment	<p><i>In accordance with CEAA (2012) and the CNSC 2016 EIS Guidelines, this EIS takes into account: ...</i></p> <p><i>comments from the public — or, with respect to a designated project that requires that a certificate be issued in accordance with an order made under section 54 of the National Energy Board Act, any interested party — that are received in accordance with this Act [CEAA]; ...</i></p>	<p>See Comment 8 above. By not addressing the comments submitted on the Project Description [7], the authors have not “... taken into account ... comments from the public ... that [were] ,, , received in accordance with this Act ...”</p> <p>Please address ALL comments “... received in accordance with this Act ...”</p>
19.	2-9	2.4 Public and Stakeholder Engagement The summary table	<p>The issues specifically identified in under the “Issue” column in the table are:</p> <ul style="list-style-type: none"> • Species at risk • Ottawa river • Effects of the environment on the project • Monitoring • Financial • Land use 	<p>Two significant issues need to be included in any public engagement activities that are not identified in this table. These are:</p> <ul style="list-style-type: none"> • entombment of the reactor does not meet international best practice, and • there may be no end to the IC period. <p>If during, the public engagement activities, the participants did not identify these two issues, then it is incumbent on the proponent to ensure these issues are presented for discussion.</p> <p>As such, these questions and responses miss the underlying problem with this project. That problem is the choice of “entombment” as the preferred option. If CNL or the authors addressed the comments submitted on the Project Description, this drawback would be obvious.</p> <p>This table constitutes sufficient evidence that CNL is out of compliance with Section 19(1)(c) of CEAA 2012. (See Comments 8 and 18 above.)</p>

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20.	2-10	2.4 Public and Stakeholder Engagement	<p><i>As seen in the table above, while most of the key issues that stakeholders have brought forth have been resolved or incorporated into the design of the project, one outlier is with regards to land use of the unaffected areas of the NPD site. To address this issue, CNL has clarified through consistent messaging and communications with stakeholders that the NPD property belongs to AECL, a federal corporation. Once CNL completes the decommissioning of the NPDWF, AECL will look at the future of the lands. AECL will take into account consideration for stakeholder engagement, as appropriate, and the duty to consult with Aboriginal peoples.</i></p>	<p>See Comments 8, 18 & 19 above. The key issues with the project that the stakeholders identified have not been addressed.</p> <p>In addition, the “duty to consult with Aboriginal peoples” cannot occur “Once CNL completes the decommissioning of the NPDWF ...” (See also Comment 50 below)</p> <p>Please address <u>ALL KEY ISSUES</u> with this project. Please include a justification as to why international best practice was not discussed at these engagement sessions (see Comments 3 & 4 above).</p>
21.	2-16	Figure 2.7-1. Valued Components Selected for the EIS, by Environmental Component	<p>The following are the environmental components depicted in the figure.</p> <ul style="list-style-type: none"> • Terrestrial environment • Aquatic environment • Socio-economic environment • Aboriginal land and resource use • Human health. 	<p>Except for the two Human Health components it is unlikely that any of these VCs will not have changed over the 100 years of the IC period due. This figure ignores effects of time on each of these VCs.</p> <p>As to what can happen to VCs over a 100-year IC, one just has to consider what these components were like 100 years ago. Since the future is even more uncertain than the past, projections over the next 100 years is considerably more problematic.</p> <p>As such, including these as VCs is somewhat meaningless. The project can do very little to maintain these components over the 100-year project schedule.</p> <p>See also Comment 10 above.</p>

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22.	3-8 and 4-26	Comparing the last paragraph on Page 3-8 with the second sentence top paragraph of Page 4-26	<p>Compare</p> <p><i>The project proposes in-situ decommissioning of the NPDWF, which isolates the contaminated systems and components inside the below-grade structure <u>thus creating a waste disposal facility on the NPD site.</u></i></p> <p>with</p> <p><i>Based on the activation products within the reactor system, a small volume (~ 125 m³) could be classified as ILW and therefore require the degree of containment and isolation afforded by the reactor vault shielding.</i></p>	<p>It appears that the authors are proposing to dispose of ILW (intermediate level wastes) within their new “waste disposal facility”. Given that, a “near surface facility” is not acceptable for the disposal of ILW (see Comment 4 above), one can conclude that the proponent did not appropriately assess the alternative means.</p> <p>(With respect to the occurrences of the terms “ILW” and “Intermediate Level Wastes” in the NPD documentation, see Comment 14 above. With respect to the authors’ inappropriate definition of ILW, see Comment 15 above.)</p> <p>See slide on the top left of Page B-45, Appendix B, <i>Stakeholder Engagement Report</i>, TSD, copied below. Although it is difficult to read, the legend for the red blocks is identified as “Intermediate Level Radioactive Material.</p> <p>Personal Note: As several members of the Proponent’s staff will recall, this overhead is a depiction of one of the posters that were displayed at the CNL Open House held in Deep River, October 2016. I raised this issue with the proponent’s staff, AECL staff, several members of the public and the consultant (the author of this EIS) present at that session. Public access to electronic copies of these poster boards was delayed until the beginning of November 2016. The copies of the posters that were made available on the CNL webpage, were modified subsequent to the Open House to remove any reference to “Intermediate Level Radioactive Material”. I communicated these concerns with CNSC staff. [14].</p> <p>These changes suggest that the proponent wishes to downplay the fact that ILW will be entombed, in order to minimize any “push back” thus facilitate the approval process. (See also Comment 14 above.)</p>
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[14] W. Turner, Personal communication to the CNSC staff, November 2, 2016.

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				<p>The diagram, titled "Alternative Means Assessment", compares four options for the NPD closure project. Option 1, "Continued Storage with Surveillance", costs \$2.5 billion per year. Option 2, "Partial Dismantling and Removal", costs \$1.4-1.6 billion. Option 3, "Full Dismantling and Removal", costs \$1.0-1.2 billion. Option 4, "In-Situ Decommissioning", costs \$1.4-1.6 billion. The diagram shows cross-sections of the reactor and containment structures for each option. Option 3 includes a timeline for the full dismantling and removal process, showing the reactor and containment structures being removed and replaced by a new structure.</p>
23.	3-13	3.4 Applicant Organization	<p>“As discussed in Section 3.1 above, ... under a Government-owned, Contractor-operated (GoCo) model (Schruder 2017)”. [emphasis added]</p>	<p>In Section 13, <i>References</i>, this citation is given as: <i>Schruder, K. 2017. NPD Closure Project Organization. 64-514100-ORG-001. Prepared for CNL. May.</i></p> <p>However, the actual author identified on this document is J. Ingram (see Footnote [1]). See Comment 1 above. The lack of simple quality in the development of this document is inexcusable.</p>

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24.	4-1	4.1 Purpose of Project Second paragraph	<p><i>In Canada, nuclear waste producers and owners are responsible for the funding, organization, management and operation of disposal and other facilities required for their wastes. CNL has developed an Integrated Waste Strategy (IWS) which concisely details “cradle to grave” pathways for all CNL waste streams, from generation to final disposition. The IWS is based on CNL’s waste inventory and forecast data and founded on the fundamental principles of waste avoidance, minimization and re-use. It enables the assessment of the quantities and types of waste across the spectrum of waste that CNL manages, (e.g., from clearable waste to used fuel). <u>In-situ decommissioning of NPDWF meets one of the CNL integrated waste strategy objectives by providing a disposition route for the NPD reactor, components and systems.</u> Previous NPD decommissioning strategies had delayed closure of the NPD site until future disposal facilities had become available. The proposed project ensures CNL focuses their environmental efforts on limiting nuclear legacy obligations for future generations.</i></p>	<p>The CNL summary IWS document [15] does not include any definition of the various waste classes such as those in the IAEA guidelines [13] or the CSA standard [16]. Further, the IWS summary document contains no references.</p> <p>Since there are no definitions for the various waste classes, the summary document cannot provide any guidance as to the acceptable characteristics of the wastes that end up in the various postulated treatment (i.e. processing), storage or disposal facilities. In other words, it is not a strategy.</p> <p>Without that guidance, the paragraph quoted to the left, CNL has invented its own waste classification to justify its choice of disposal facility. Thus by using a circular argument, the authors can honestly state:</p> <p><i>In-situ decommissioning of NPDWF meets one of the CNL integrated waste strategy objectives by providing a disposition route for the NPD reactor, components and systems.</i></p> <p>However, using the waste destination to create its own waste classification, CNL’s argument that entombment “... <i>meets one of the CNL integrated waste strategy objectives</i> ...” cannot be justified.</p> <p>Without access to the full IWS document, one cannot determine whether this strategy meets the applicable Canadian and International standards, guidelines, or best practice. If this summary document is an accurate reflection of CNL’s overall strategy, then one can only conclude that their approach to managing radioactive wastes is significantly flawed.</p> <p>NOTE: A reference to CNL’s IWS summary document is NOT included in Section 13, the list of references.</p>

[15] CNL, *Canadian Nuclear Laboratories Integrated Waste Strategy Summary Document*, CW-508600-PLA-006 Revision 0, April 2017

[16] CSA N292.0-14, *General Principles for the Management of Radioactive Waste and Irradiated Fuel*

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25.	4-2	4.1.1 Robustness of the System	<p><i>In-situ decommissioning provides containment and isolation of the NPDWF inventory for a sufficiently long time to ensure that the postclosure environmental concentrations do not cause adverse effects to human health or the environment. The assessment shows that the decommissioned facility will contain the dominant radioactive and non-radioactive contaminants very effectively.</i></p> <p><i>For most of the assessed period, only a small percentage of the initial total radioactivity is released from the NPDWF as soluble contaminants. Even after 50,000 years, the vast majority of the radioactivity (i.e., over 98%) remains in the NPDWF. The remainder gradually decays and disperses so that when it reaches the accessible environment, concentrations are sufficiently low such that the corresponding doses are negligible. These predicted releases are only a small fraction of the current NPD emissions.</i></p>	<p>See Comments 9 & 11 above. If the authors used the unconditional clearance criteria as the objective for the residual radioactivity at the site, the paragraphs quoted to the left are essentially meaningless.</p> <p>One would not need to provide “...containment and isolation of the NPDWF inventory for a sufficiently long time to ensure that the postclosure environmental concentrations do not cause adverse effects to human health or the environment ...”, since the site could be abandoned with no restrictions on its use.</p> <p>Further, if after the IC period, unconditional clearance criteria are met, then who would care that</p> <p><i>Even after 50,000 years, the vast majority of the radioactivity (i.e., over 98%) remains in the NPDWF. The remainder gradually decays and disperses so that when it reaches the accessible environment, concentrations are sufficiently low such that the corresponding doses are negligible. These predicted releases are only a small fraction of the current NPD emissions “</i></p> <p>As to whether the “... predicted releases ... [would be] ... only a small fraction of the current NPD emissions”, I should hope so. Even if the site was left as is, without any knowledge other than all radionuclides have half-lives, I could probably predict the emissions 50,000 years into the future would be a small fraction of current emissions.</p> <p>The authors need to demonstrate that the site can be abandoned after the IC period. As such, they need to demonstrate that the residual radioactivity at the site will meet unconditional clearance criteria. Once this is proven, any residual emissions would be <i>de minimus</i>.</p>
26.	4-2	4.1.2 Natural Analogues	<p>The authors cite four examples of natural analogues to demonstrate the long-term stability of the entombed structure.</p>	<p>See Comment 25 above.</p> <p>If the residual radioactivity at the site met unconditional clearance criteria, one would not have to demonstrate any long-term stability. This conclusion assumes that during the IC period, the proponent has addressed the appropriate controls to restrict access to the site by humans, and biota, and all emissions do not present unacceptable risks to the biosphere.</p> <p>As to whether the authors have demonstrated the appropriate protection, as discussed in Comment 27 below, the only conclusion is “No. they have not”.</p>

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27.	G-77	Post Closure Safety Assessment, Appendix G – Detailed Results	Figure G-75	<p align="center"> </p> <p>Figure G-75: Radiation Doses to Adults Site Resident (Mass Excavation Case)</p> <p>With respect to this figure, not much further can be said other than; the site cannot be abandoned after the 100-year IC period.</p> <p>I modified this figure to include two lines. The red line represents the 1 mSv/yr dose limit. The green line represents the dose constraint of 0.3 mSv/yr. The location of this latter line is approximate since the axes are logarithmic making it difficult to place exactly.</p> <p>What is disturbing is that at the end of the IC period (the yellow area), the residual activity never meets unconditional clearance criteria [8]. Thus, the site cannot be abandoned until way past the 100,000-year upper bound shown on the x-axis.</p> <p>The authors have two options. Either</p> <ul style="list-style-type: none"> • revisit the project such that whatever they propose will allow for the radioactivity contained in the entombed facility to decay to the extent that the ultimate goal “to abandon the site after the Institutional Control period” can occur within the 100-year time period, or • explicitly state that the IC period will last indefinitely. <p>Either option means that their chosen alternative will not meet the overall goal for the project, which, as defined by the authors, is to ensure the site can be abandoned (see Comment 16 above).</p>
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				<p>See also Comment 3 above. What is most ironic about this figure is that it provides visible proof of why Section 1.10 from the IAEA publication, <i>Decommissioning of Facilities</i>, General Safety Requirements Part 6 [4], states:</p> <p><u>Entombment</u>, in which all or part of the facility is encased in a structurally long lived material, is not considered a strategy and <u>is not an option in the case of planned permanent shutdown</u>. [emphasis added]</p> <p>The proponent could have saved a considerable sum of money trying to prove that the IAEA statement quoted above was erroneous. However, not is all lost. Thanks to the authors, we now have visible proof confirming this IAEA statement.</p> <p>We cannot say the same with respect to the monies spent on the <i>Alternative Means TSD</i> that purports to prove that, when compared to other alternative means, the entombment option is the best. Since the selection criteria used are significantly flawed (for example, see Comment 36 below), the analyses described in the <i>Alternative Means TSD</i>, provide nothing useful with respect to the demonstrating that “entombment” is the optimum choice.</p>
28.	4-3	4.2 Alternative Means of Carrying out the Project	<p><i>“The decommissioning of the NPDWF has been proposed using the In-Situ Decommissioning approach, as discussed in Section 2.2 of the Alternative Means Assessment TSD, ...”</i></p>	<p>There are at least four issues with this statement.</p> <p>First – The statement implies that the authors proposed “in-situ decommissioning” before assessing the alternatives. This is essentially confirmed by the authors’ purpose statement (see Comment 17 above)</p> <p>Second – As discussed in Comments 4, 22 & 27 above, the chosen option is not suitable for the disposal of ILW.</p> <p>Third – As discussed in Comment 50 below, the option of entombment was chosen before any reasonable assessment of the alternatives could have been conducted.</p> <p>Fourth – Section 2.2 of the <i>Alternative Means TSD</i> does not meet the requirements of Section 19(1)(g) of CEAA.</p> <p>To quote from Section 2.2 of the TSD:</p> <p><i>Several alternative means are provided in the Project Description (Titterington 2016). It is worth noting that some of these alternative means will require further action at some later time. For example, a removal alternative may require the consideration of future disposal. For the analysis being conducted here, the potential impacts of these further actions are not included. <u>Each alternative is analysed under the assumption that institutional controls are in effect for at least 100 years and that there is the possibility that they fail beyond 100 years and there is therefore no further maintenance or monitoring beyond that point.</u></i> [emphasis added]</p> <p>It appears the authors have precluded an assessment of the environmental effects of all four alternative means as required by Section 19(1)(g) of CEAA 2012.</p>

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				<p>Note: The statement highlighted above contains the following: <i>“... that there is the possibility that they [the ICs?] fail beyond 100 years and there is therefore no further maintenance or monitoring beyond that point ...”.</i></p> <p>The idea that because the ICs fail beyond 100 years means that “... no further maintenance or monitoring ...” is required, cannot be true.</p> <p>The authors of this TSD must revisit their assumptions since a failure of this kind cannot be seen as acceptable unless the residual radioactivity meets unconditional clearance criteria. In which case, if all the controls are gone, then there is nothing to fail, and any failure is meaningless.</p>
29.	4-4	4.2 Alternative Means of Carrying out the Project	<p><i>“It is difficult to specify alternative disposition pathways for the radioactive material within NPDWF, primarily for the reactor system and components, given that an alternate waste storage or disposal facility would require waste categorization dependent on the alternate facility’s waste acceptance. ...”</i></p>	<p>If CNL’s <i>Integrated Waste Strategy</i> met its stated objective, this statement cannot be true. To quote from Section 1 of CNL’s IWS summary, <i>Overview</i></p> <p><i>“The Canadian Nuclear Laboratories (CNL) Integrated Waste Strategy (IWS) is a communication tool which focuses on the management of wastes using a lifecycle (cradle to grave) approach. It establishes integration and alignment with the goals and requirements of CNL’s primary business missions, including lifecycle cost optimization.</i></p> <p><i>The IWS applies to all CNL managed radioactive and non-radioactive waste streams for the full waste management lifecycle including pre-treatment, treatment, storage, transport, and disposal.”</i> [15]. [emphasis added]</p> <p>Please delete this sentence. My understanding is that if CNL’s IWS has addressed all “cradle to grave” approaches then all alternatives including the whole lifecycle for the various waste classes have been identified along with their acceptance criteria for “... <i>pre-treatment, treatment, storage, transport, and disposal</i> ...”</p> <p>Note: Since CNL refuses to provide a copy of the complete IWS [5], this last statement cannot be verified. The summary document that CNL provided, does not address this aspect of their overall waste strategy (see Reference [15]).</p>
30.	4-4	4.2 Alternative Means of Carrying out the Project	<p><i>“Currently, CNL only has interim waste storage for most ILW until a future ILW disposal facility becomes available (CNL 2017b).</i></p>	<p>As stated in Section 13 of the EIS, reference “CNL 2017b” refers to:</p> <p><i>CNL, Near Surface Disposal Facility – Environmental Impact Statement Executive Summary. Prepared by Golder Associates for CNL. Report No. 1547525, March 2017.</i></p> <p>The problem is, the statement quoted to the left does not appear in the <i>Executive Summary</i>.</p> <p>Please ensure all references are correct.</p>

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31.	4-5	4.2 Alternative Means of Carrying out the Project	<p><i>1. Continued Storage with Surveillance (SwS)</i></p> <p><i>Continued SwS has been listed first here and throughout the document because it is used as a baseline case against which the other alternative means are compared.</i></p>	<p>It is not clear that SwS is an appropriate baseline for comparison. Three reasons:</p> <p>First – It cannot be considered an alternative means since it does not address the purpose of the project as stated in Section 4.1:</p> <p>“The purpose of the project is to safely carry out the decommissioning of the NPDWF...”</p> <p>Second – Unless NPD is decommissioned, the activities associated with SwS can never cease. The facility remains in the storage state forever.</p> <p>Third – SwS is an interim state, not a final state.</p> <p>Please delete all references and discussions that suggests that SwS is an “alternative means”</p>
32.	4-7	4.2 Alternative Means of Carrying out the Project (3 rd paragraph from the top)	<p><i>In Table 4.2-2 it can clearly be seen that for the Decommissioning Execution phase all of the alternatives carry increased risk relative to the baseline case, “1. continued SwS”.</i></p>	<p>This statement is the perfect example of why SwS is not an appropriate “alternative means”.</p> <p>Since SwS does not address the purpose of the project, all other alternatives that do result in a decommissioned NPD will reduce the risk, no matter how that risk is defined (qualitatively or quantitatively).</p> <p>See Comment 31 above. Please delete all references to SwS as an “alternative means”.</p>
33.	4-7	4.2 Alternative Means of Carrying out the Project (4 th paragraph from the top)	<p><i>In the Institutional Controls phase, Table 4.2-3, the differences between the alternative means starts to become more obvious. This is a result of the work put in during the active decommissioning. It can be seen that again, “4. in-situ decommissioning” has many benefits over the others.</i></p>	<p>This statement contains an egregious error. Of all the alternatives, the only one that requires “Institutional Control” is “in-situ decommissioning”.</p> <p>Why?</p> <p>Option 1 – SwS does not result in a decommissioned site.</p> <p>Options 2 and 3 – “Partial Dismantling and Removal” and “Full Dismantling and Removal” removes the source such that no IC will be required</p> <p>Option 4 – “In-Situ Decommissioning” leaves the source in place, thus requiring IC until the residual activity meets unconditional clearance criteria.</p> <p>Please revise Table 4.2-3 to address this serious error.</p>

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34.	4-7	4.2 Alternative Means of Carrying out the Project (5 th paragraph from the top)	<p><i>Finally, in the Post-Institutional Controls phase, Table 4.2-4, the benefits of permanent disposal can be seen even more. “4. in-situ decommissioning” continues to have much less risk than the baseline case, as the contaminants are all held in the grouted monolith. As with the Institutional Controls phase, it can be seen that “3. full dismantling & removal” is very similar to the baseline case.</i></p>	<p>The authors have provided little evidence to support the conclusion as quoted in the cell to the left. In fact, the evidence provided in this EIS directly contradicts this conclusion.</p> <p>As discussed in Comment 16 above, the term “Post-Institutional Controls phase” is essentially meaningless. To repeat, at the end of the IC period, the site is to be abandoned.</p> <p>As discussed in Comment 33 above, only the entombment option requires IC. Thus for all other options, there can be no “Post-Institutional Controls phase”</p> <p>The following is a quote from Page 3-8 of the EIS:</p> <p><i>The project proposes in-situ decommissioning of the NPDWF, which isolates the contaminated systems and components inside the below-grade structure <u>thus creating a waste disposal facility on the NPD site.</u></i></p> <p>The authors also state that this disposal facility will contain ILW (see Comments 14 & 22 above). Given the IAEA’s definition of intermediate level wastes [13], for the entombment option, it is doubtful that there will ever be a post-institutional control phase, as the authors have conclusively shown in the figure from Appendix G, <i>Post Closure Safety Assessment TSD</i> (see also Comment 27 above).</p>

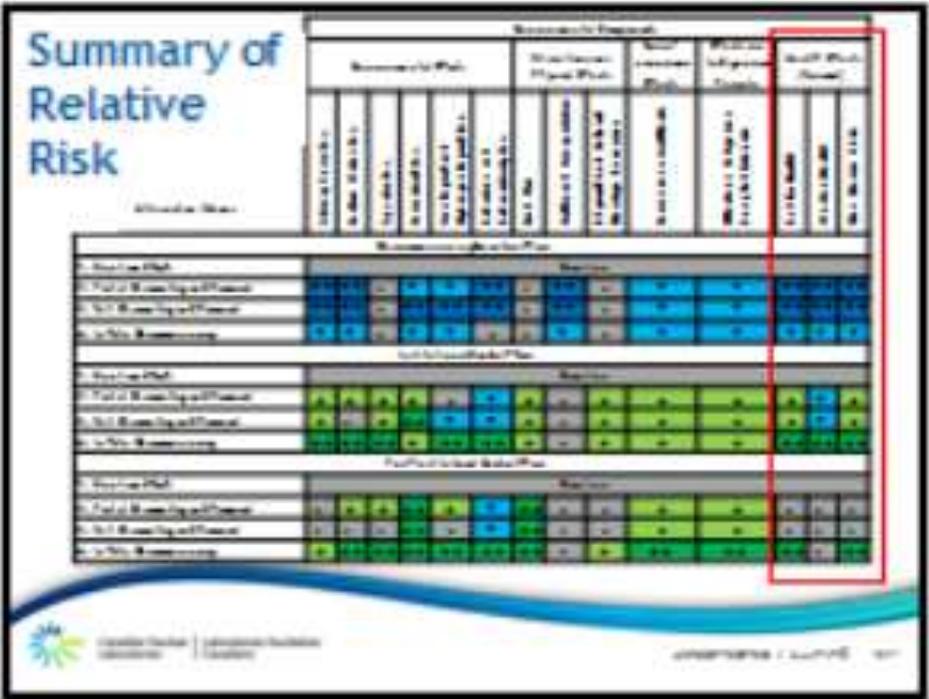
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35.	4-7	Table 4.2-1. Relative Risk Scale	See Comment 9 above.	<p>This table provides a “qualitative” evaluation of risk. A quantitative risk scale should be used, however it requires more effort to develop. One can define risk as consequence multiplied by likelihood (see Comment 9 above). For a disposal project that has the potential very-long term consequences, a qualitative risk scale is not the appropriate measurement tool for a risk evaluation of this type.</p> <p>Somewhat disconcerting is that the authors’ qualitative approach was questioned about one year ago during a technical session held in Deep River in January 2017.</p> <p>A summary of the issues raised, and the questions asked at that session is provided in the <i>Stakeholder Engagement TSD</i>. The following is the Q&A exchange at this session with respect to alternative means assessment topic quoted from Appendix C, Q4 of that TSD, <i>Table C.1 Technical Discussion Meeting Agenda and Questions January 2017</i>.</p> <p><i>Q. Quantitative or qualitative assessment for alternative means?</i></p> <p><i>A. Qualitative.</i></p> <p><i>Q. Any quantitative?</i></p> <p><i>A. Other reports and assessments have been quantitative yes, but not as part of alternative means.</i></p> <p><i>Q. Summary of relative risk is health risk, but I am interested in effects on Indigenous people. Column three has light blue up arrow for effects on Indigenous people. I’m thinking reuse of land, the NPD land that is non-impacted by the plant. So I’m thinking there are social benefits of complete dismantling and removal. Non-nuclear modelling factors can end up scuppering a project and delaying it for decades.</i></p> <p><i>A. We did look at hunting, fishing, gathering uses. Risks goes down after decommissioning after land is released for reuse. [Property is around] 1000 acres, less than 10 acres will be fenced off. Therefore, the rest of land will be able for whatever use. The alternative means does look at socio-economics for the surrounding area – from a qualitative standpoint.</i></p> <p><i>Q. Good answer, logical answer with reference to area of land. But, if material is removed, [it could] go from some impacted land to zero impacted land. From point of view of emotion and intensity of First Nations interest in this area [this technique could be looked on more favourably].</i></p> <p><i>A. Thank you, good point.</i></p> <p><i>Q. Who carried out [alternative means assessment]?</i></p> <p><i>A. Arcadis.</i></p> <p><i>C. Question whether there could be risk of bias in alternative means. Don’t think the waste disposal site at NPD can be looked at independently of waste disposal site somewhere down the road. Think there will have to be an assessment that takes this into account. Alternative</i></p>
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				<p><i>means needs to look at broader picture of what storage means. Some assumptions are made that waste will go down the road and into storage. ...</i></p> <p><i>Q. You would expect long term public health risk, it's not likely to stay as above ground long term storage [because there are other plans for nuclear waste disposal in the works]; [would other parallel disposal plans in Canada] change the favourability of in-situ decommissioning?</i></p> <p><i>A. We are looking at availabilities in Canada right now. So it is something we can consider as we go forward, but now, long term storage is the only option available [as there are no disposal sites in Canada]. ...</i></p> <p><i>Q. Start date and cost?</i></p> <p><i>A. Early 2018 [is the start date], [we] expect to be complete by spring of 2020. Total cost is estimated to be between \$40-60 million.</i></p> <p><i>Q. Does that include institutional control costs?</i></p> <p><i>A. No.</i></p> <p><i>Q. How can you make a fair comparison [with alternative techniques] when you aren't taking institutional control into comparison?</i></p> <p><i>A. Monitoring costs are low and we do have an estimate for it.</i></p> <p>The above Q&A exchange suggests there were issues with the alternative means selection process.</p> <p>The figure below is copied from the depictions of the overheads used at this January technical session. This figure shows the results of alternative means assesement. Although it is extremely difficult to read, a comparison of the results presented to the session with the three tables in the EIS (Table 4.2-2 <i>Summary of Relative Risk for Decommissioning Execution Timeframe</i>, Table 4.2-3 <i>Summary of Relative Risk for Institutional Controls Phase</i>, and Table 4.2-4 <i>Summary of Relative Risk for Post-Institutional Controls Phase</i>) can be done since the legend is the same for the figure and the three tables.</p> <p>Since the legend is the same, one only needs to compare the colours. When that is done, it is obvious that the feedback given at the January 2017 technical session regarding re-evaluating the alternative means selection process was ignored.</p>
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36.	4-8 to 4-10	Tables 4.2-2 through 4.2-4	The application of the relative risk scale given in Table 4.2-1	<p>All the up, down arrows and the coloured boxes associated with these arrows imply an equal weighting among all the various factors defined by the column headings.</p> <p>Since for each component, the duration is a contributing factor and that duration will be different, the risk weightings across these components cannot be equal. Further, these “arrows, and colours” do not consider the implementation of any mitigation measures. Thus, they cannot compare the effects of the project across the various components nor can they assess the residual effects “AFTER” the required mitigation as required by CEAA (2012).</p> <p>As a single example, consider the last three columns in these three tables. Under current CNL policies and procedures, all the potentially adverse human health effects must be addressed for all activities, no matter what those activities entail or when they occur. In other words, these policies and procedures (P&Ps) can be seen as mitigation measures. The result is that after the implantation of these P&Ps, all residual effects will be the same. Therefore, all these boxes should be grey, with no arrows. Thus, using the up and down arrows and the coloured boxes to depict differences is misleading. This assumes, of course, that CNL’s P&Ps apply to those activities.</p> <p>Except for the “Socio-economic Effects” and the “Effects on Aboriginal People”, a similar argument can be given for all the other components shown in these tables. To assess these two exceptions requires input from the affected parties.</p> <p>Please revisit the alternative means assessment and evaluate the residual effects to the environment AFTER the implementation of the mitigation measures as required by CEAA (2012)..</p>
37.	4-9	Table 4.2-3	The application of the relative risk scale given in Table 4.2-1	<p>In Table 4.2-3, the dark green arrows associated with Option 4 suggest that most of the risks associated with the IC period will be less than that for any other alternative. Since for all other options (i.e. 2 & 3) there is no IC period (see Comment 33 above), that cannot be true.</p> <p>All arrows associated with Options 2 & 3 should be removed, and all boxes should be coloured grey.</p> <p>Please revisit the alternative means assessment.</p>
38.	4-10	Table 4.2-4	The application of the relative risk scale given in Table 4.2-1	<p>See Comment 34 above. Without an IC period associated with Options 2 & 3, all arrows must be deleted and all boxes must be coloured grey.</p> <p>With respect to Option 4, since the site is to be abandoned the residual risk must meet unconditional clearance criteria. Therefore, all arrows must be deleted, and all boxes must be coloured grey.</p> <p>Please revisit the alternative means assessment.</p>

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39.	4-11	4.2 Alternative Means of Carrying out the Project	<p><i>In addition to relative risk, absolute risk was also considered in the comparison of alternative means. For example, if alternative means X has negligible risk, but is deemed to be higher than the even smaller risk of alternative means Y, the absolute risk does not give undue credibility to alternative means Y. Similarly, if alternative means X is deemed to have less risk than alternative means Y, but both alternative means carry a significant risk to the environment, alternative means X cannot be considered as a good option, as it will still have significant environmental effects, regardless of how it compares to alternative means Y.</i></p>	<p>I cannot find any discussion of “absolute risk”, “negligible risk” or “significant risk”. Since the authors have only provided a “qualitative relative risk scale” (Table 4.2-1), assigning these three terms (“absolute”, “negligible” and “significant”) to any risk comparison represent the authors’ speculation. As comparators, they are not objective. As such, they are meaningless.</p> <p>See also Comment 36 above.</p>
40.	4-12	4.3 Scope of the Project	<p><i>Therefore, for EA purposes, the project will consider:</i></p> <ul style="list-style-type: none"> • <i>assembly and operation of the batch mixing plant;</i> • <i>grouting of below grade structures;</i> • <i>removal of above grade structures to be used as backfill;</i> • <i>installation of concrete cap and engineered barrier over the grouted area;</i> • <i>final site restoration; and</i> • <i>preparation for and implementation of long-term care and maintenance.</i> 	<p>I find it interesting that in the list of items to be considered in the EA, the ultimate goal “abandonment of the site” is not included.</p> <p>One can speculate that one of the reasons is, the site cannot ever be abandoned, and the Institutional Control period will last forever. As a result, “long-term care and maintenance” will be required in perpetuity.</p> <p>The fact that this goal is not included allows the authors to truncate the assessment of alternative means to the assumed end of the IC period, which is 100 years (see Comment 25 above.)</p> <p>The authors need to address all aspects of the project, including the proposed end-state, abandonment.</p>

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41.	4-12	4.3.1 Project Components and Activities	Grout?	<p>What is the difference between concrete and grout? Where will these different materials be used to completely fill all void spaces within the NPD structure?</p> <p>Please provide sufficient detail with respect to the development of the grout design, grout production (batch plant) and grout placement technology with their respective QA/QC requirements (including testing)</p> <p>Will all the void spaces, including the piping, tanks, ventilation shafts, be filled with grout? As these spaces are filled, there will be releases of the atmospheric gases contained in those voids. These releases will have the potential for the spread of airborne radioactive particulates both inside and outside the facility. Please provide an estimate of those releases and explain how these particulate releases will be mitigated and monitored.</p>
42.	4-20	4.4.1.1 Existing Radiological Inventory	<p><i>“The majority of the radioactivity, i.e., 75%, is contained in the reactor vault, mainly associated with the disused reactor vessel, the calandria. It is necessary to distinguish between the various materials present, as they differ in both radionuclide inventory and in terms of the mode and rate of release of radionuclides. In particular, radionuclides embedded in metals will only be released at the rate at which the metals themselves corrode, which can be very slow for materials such as zircaloy. The radiological inventory of the reactor system is therefore categorized as being associated with: ...[then follows a list of six components] ...”</i></p>	<p>Since the author of the EIS report is the <i>VP of Radioactive Waste Management & Decommissioning</i> for Arcadia Canada, Inc., I would expect that an assessment of the radioactive contents of any radioactively contaminated system would specifically address the activity of those components, not just give a number related to the total activity.</p> <p>As the author state, <i>“It is necessary to distinguish between the various materials present, as they differ in both radionuclide inventory and in terms of the mode and rate of release of radionuclides”</i>. So what is the purpose of stating that <i>“... 75% ... [of the radioactivity] ... is contained in the reactor vault ...”</i>?</p> <p>As a minimum, the author needs to provide the estimated activity content associated with each of the three IAEA waste classes VLLW, LLW and ILW [13], for each of the six components listed.</p> <p>However, as discussed in Comment 14 above, the author has deliberately downplayed using these waste classes in their EIS and the various TSD reports.</p> <p>However, the number 75% suggests something else. By removing the reactor vault, one will reduce the total activity at the site significantly. If it is removed, then achieving the goal of abandoning the site in 100 years becomes considerably easier.</p> <p>Recall, at the end of the IC period, the site will be abandoned (see Comment 16 above). Thus, the information as to where 75% of the activity resides does not matter. All residual activity must meet unconditional clearance criteria [8].</p> <p>Please provide the appropriate analyses to demonstrate that the unconditional clearance criteria will be met at the end of the IC period.</p>

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43.	4-21 to 4-24	Table 4.4-1. Reference Radiological Inventory for the NPDWF	N/A	See Comment 42 above. What is the predicted residual activity for each of these nuclides at the end of the IC period? How does that predicted residual activity compare to the unconditional clearance levels given in reference [8]?
44.	4-25	4.4.1.2 Existing Non-Radiological Inventory	<p><i>The inventory of non-radiological contaminants is dominated by those typically associated with 50-year-old industrial facilities. This includes:</i></p> <ul style="list-style-type: none"> • <i>Lead: from lead paint and lead bricks, previously used as shielding;</i> • <i>Mercury: from instruments, such as thermometers;</i> • <i>Asbestos: from pipe insulation, floor tiles and building cladding; and</i> • <i>PCBs: from light ballasts which will remain due to inaccessibility.</i> 	<p>As noted in Comment 16 above, the site is to be abandoned at the end of the IC period.</p> <p>This leads to an obvious question. Will the quantities of these non-radiological contaminants meet the most restrictive clean-up criteria for contaminated sites in Ontario?</p> <p>As far as I can determine, there is very little evidence that the authors have even attempted to answer this question.</p>
45.	4-30	Table 4.5-1. Potential Project-Related Releases for each Phase and Activity	<p>Column – Decommissioning Phase</p> <p>Row – Post-institutional Controls</p>	<p>As noted in Comment 16 above, the site is to be abandoned at the end of the IC period.</p> <p>If the conditions at the site are such that it can be abandoned, then these releases should not matter.</p> <p>Please address “site abandonment”.</p>
46.	5-6	5.2.1.2 Temporal Boundaries and Scale	<p>Third bullet:</p> <ul style="list-style-type: none"> • <i>Post-Institutional Controls</i>, which includes abandonment of the site following institutional control. Assessment of the Post-Institutional Controls phase extends far into the future. 	<p>This bullet confirms Comment 16 above. The site will be abandoned. If abandonment is the goal, then all one needs to do is to assess the residual activity against unconditional clearance criteria. There is not need to assess anything “... far into the future”.</p> <p>Please revise.</p>

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47.	5-11	5.2.3 Constituents of Potential Concern	<p><i>Constituents of potential concern (COPCs) are contaminants that may pose a risk to the environment, based on current or predicted future concentrations in the environment.</i></p>	<p>Again, when identifying COPCs, the authors need to consider the ultimate goal of this undertaking, site abandonment (see Comments 16 & 46 above).</p> <p>If the site is to be abandoned, then there is no need to predict future concentrations except to demonstrate they meet unconditional clearance criteria as defined in reference [8].</p> <p>However, one needs to identify the COPCs with respect to the currently planned project activities associated with the temporal boundary between now and the end of the IC period. Recall, this is an Environmental Assessment. As such, one critical component of this EA is the interactions of the physical activities associated with the physical work with the environmental components.</p> <p>Note: If the authors cannot prove that the residual activity will meet unconditional clearance criteria at the end of the IC period, then they will need to determine how to address those contaminants such that the unconditional clearance criteria can be met. This could include dismantling, packaging, and transporting the “offending” contaminants to another “disposal” location.</p>
48.	5-14 to 5-15	5.2.4.1 Valued Component Selection Methodology and Process	<p>The activities listed in this section include</p> <ol style="list-style-type: none"> 1. Creating a master list 2. Using a project interaction matrix assign the VC to an environmental component 3. Provide an opportunity for public engagement 4. Draft the list 5. Produce the final list. 	<p>I regret that I have to point out that this list of activities is severely flawed. The authors represent a reputable consulting company, therefore they should know be aware of the shortcomings in this list.</p> <p>The implicit assumption is that the list of VCs that currently exist on the site will be the same over the entire project timeline cannot be true. (See also Comment 10 above.)</p> <p>I am not aware of any biodiversity studies conducted at the time the site was chosen as the location of the NPD reactor over 60 years ago. I doubt that if one conducted a VC selection at that time, the results would be similar to the outcomes from the process described in this report. One only has to point to the current inhabitants to the ventilation stack. I doubt that chimney swifts inhabited the stack when the facility was operational (about 30 years ago).</p> <p>Now the site is home for a SARA listed species that was not even present until a comparatively few years ago. Yet the authors wish us to believe that this project will protect their listed VCs when only a few years ago, one of those VCs was not even on the list. The assumption that the current VCs will be around when the site is abandoned 100 years from now, is preposterous.</p> <p>Please revisit the VC selection process and include consideration of the full temporal boundary of the project.</p>

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49.	6-1	6 PUBLIC AND STAKEHOLDER ENGAGEMENT	<p><i>This section describes past, ongoing and proposed public and stakeholder engagement activities and events in accordance with the Generic Guidelines for the Preparation of an Environmental Impact Statement (CNSC 2016a), which state:</i></p> <p><i>“...the EIS will describe the ongoing and proposed participation activities that the proponent will undertake or that it has already conducted on the project. It will describe efforts made to distribute project information, as well information and materials that were distributed during the public consultation process. The EIS will indicate the methods used, where the consultation was held, the persons and organizations consulted, the concerns voiced and the extent to which this information was incorporated in the design of the project as well as in the EIS. The EIS will provide a summary of key issues raised related to the Project and its potential environmental effects, as well as describe any outstanding issues and ways to address them.”</i></p>	<p>CNL has yet to address the comments submitted on their Project Description [3] as documented by the CNSC [7].</p> <p>In addition, CNL has been remiss in providing copies of the documents listed in Section 13 of the EIS, “References” in a timely manner. This makes reviewing the EIS much more difficult.</p> <p>See Comments 3, 8, 22 & 35 above & 50 below. With respect to this section, no further comment is required.</p> <p>The authors need to revisit their <i>Public and Stakeholder Engagement</i> and specifically address the purpose of CEAA, which is:</p> <p><i>Purposes</i></p> <p><i>4 (1) The purposes of this Act are ...</i></p> <p><i>(e) to ensure that opportunities are provided for meaningful public participation during an environmental assessment; ...” [emphasis added]</i></p> <p>One can only conclude that “<i>meaningful public participation</i>” is not a high priority with the proponent.</p>

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50.	6-5	6.2.1.1 Environmental Stewardship Council – October 2015	<p><i>“On October 29, 2015, the NPD closure project was first introduced to the members of the ESC as a part of a Decommissioning and Waste Management update.</i></p> <p><i>See Appendix Q1 of the Stakeholder Activities TSD.”</i></p>	<p>Appendix Q1 of the <i>Stakeholder Activities TSD</i> provides no information regarding this ESC meeting.</p> <p>Therefore, one cannot confirm whether this project was presented at that time.</p> <p>If the statement that “... <i>the project was first introduced ...</i>” in October 2015 is taken at face value, then in less than two months from the commencement of the contract with CNEA, CNL made the decision to entomb the reactor. Therefore, all subsequent activities associated with the decommissioning of the NPD reactor focused on justifying “entombment” as the preferred option.</p> <p>A cursory review of the <i>Stakeholder Activities TSD</i> shows that all subsequent communication activities consisted of announcements and all responses to questions consisted of defending the decision. Engaging the public and/or the indigenous peoples in a two way communication process was not a priority</p> <p>For a radioactive waste disposal project, this approach is NOT acceptable. One cannot decide on a “solution” before understanding and defining the “problem”. That process must be open and transparent from beginning to the end.</p> <p>See also Comment 49 above.</p>

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51.	7-1	7 ABORIGINAL ENGAGEMENT	<p><i>An Aboriginal Engagement Report (AER) TSD for the proposed NPD closure project was prepared in 2016 by CNL in accordance with the CNSC’s Aboriginal Engagement Regulatory Document REGDOC-3.2.2 (CNSC 2016c). The first revision of the AER TSD was submitted to CNSC in 2016. A second revision will be submitted to the CNSC to accompany the EIS in September 2017. <u>A final revision reflecting ongoing Aboriginal engagement activities and updated information as a result of this engagement will be submitted to accompany the final EIS.</u> The AER TSD outlines CNL’s approach to Aboriginal engagement in order to support the EA process for the planned project. The following text summarizes CNL’s Aboriginal communication objectives, the methods adopted to meet these objectives, the First Nation and Métis communities that CNL has identified and included in its Aboriginal engagement for the project, engagement activities that have been undertaken to date, feedback received to date from communities, and further planned engagement activities.</i></p>	<p>See Comment 5 above. CNL’s use of TSDs is not appropriate.</p> <p>As the authors state, their <i>Aboriginal Engagement Report TSD</i> and the associated activities have yet to be finalized. Therefore, CNL has yet to finalize addressing Section 4(1)(d) of CEEA 2012.</p> <p>Although I do not claim to speak for any Aboriginal group, an incomplete engagement process suggests the some of following provisions of the <i>Constitution Act, 1982</i>, as quoted in REGDOC-3.2.2, <i>Aboriginal Engagement</i>, remain unresolved.</p> <ul style="list-style-type: none"> • <i>section 35 of the Constitution Act, 1982, which provides that</i> <ul style="list-style-type: none"> <i>“(1) The existing aboriginal and treaty rights of the aboriginal peoples of Canada are hereby recognized and affirmed.</i> <i>(2) In this Act, “aboriginal peoples of Canada” includes the Indian, Inuit and Métis peoples of Canada.</i> <i>(3) For greater certainty, in subsection (1) “treaty rights” includes rights that now exist by way of land claims agreements or may be so acquired.</i> <i>(4) Notwithstanding any other provision of this Act, the aboriginal and treaty rights referred to in subsection (1) are guaranteed equally to male and female persons.”</i> <p>Without completing this critical process, it is unclear whether the proponent has received any agreement as to the concerns of these communities.</p> <p>As such, all decisions made with respect to this undertaking must be considered tentative. Therefore, the production of this EIS is premature.</p> <p>Until the Aboriginal engagement activities are complete, the proponent must consider withdrawing this draft of the EIS report.</p> <p>NOTE: In the outside world, one cannot proceed with a project unless the owner of the land approves it. As I understand, there is an outstanding land claim for a considerable area of land that includes the NPD site. Thus, until the Aboriginal Engagement process is completed, the project cannot proceed and should be withdrawn until engagement with the Indigenous community is complete.</p>
52.	7-5	7.4 Engagement Methods	N/A	<p>Of the 14 methods listed in this section, none appears to include discussions about the three “alternative means”. None would allow the Aboriginal groups to present their suggested alternatives. Essentially, these methods are one-sided, consisting of announcement activities only.</p> <p>As such, none of these methods can be considered “engagement” activities.</p> <p>See Comment 51 above. Until the Aboriginal Engagement activities are complete, the proponent must consider withdrawing this draft of the EIS report.</p>

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53.	8-9	Figure 8.2-2. Daily Mean, Daily Maximum and Daily Minimum Temperature, Station ‘Chalk River AECL’, 2011 to 2015 and 1981-2010	N/A	<p>This figure depicts the variations in temperature by month at the Chalk River site. However, what would be of more interest are the trends (average, minimum, and maximum) over the years from 1981 through to 2015.</p> <p>All that this figure indicates is that summers are hotter than winters, something we already know. Given the timeline for this project covers more than 100 years, the trend in temperature over the past 34 years provides a better indication of the future at the site.</p> <p>Please revise to depict the trends in temperature over the 34 years for which the data are available.</p>
54.	8-12 & 8-13	Table 8.2-4. Precipitation Normals, Station ‘Chalk River AECL’, Ontario, 1981 to 2010 (Source: Government of Canada 2016a) & Figure 8.2-3. Monthly Precipitation for 2008 to 2016 at CRL (Source: Leeson 2016)	N/A	<p>Table 8.2-4 provides the precipitation data from the years 1981 through 2010 by month. Figure 8.2-3 depicts precipitation data for the years 2008 to 2016 this time by year and by month.</p> <p>Since data is available for all the years 1981 through to 2016, one could provide a better depiction of the long-term trends if all the information was used.</p> <p>All that the table and the figure indicate is that summers are wetter than winters, something we already know. Given the timeline for this project covers more than 100 years, the trend in precipitation over 34 years provides a better indication of the future at the site.</p> <p>Please revise to depict the trends in precipitation over the 34 years for which the data are available.</p>
55.	8-56	8.3.5.2 Regional Study Area Radiological	<p><i>“CNL has produced an in-depth model of the sediment contamination and transport at and around the outfall pipe of the CRL facility (Silke et al. 2014). The model provides a detailed assessment of the localized environment around the CRL outfall, and as such is not considered representative of the Ottawa River sediment in the Regional Study Area.”</i></p> <p>[emphasis added]</p>	<p>Given that CNL did not exist before June 2014, and the date of this reference is March 2014, it is not clear how CNL produced this model.</p> <p>The model was produced for AECL not CNL. Suggesting it was produced for CNL is misleading.</p> <p>See also Comment 75 below.</p>

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56.	8-56	8.3.5.2 Regional Study Area Radiological	<p>“CNL has produced an in-depth model of the sediment contamination and transport at and around the outfall pipe of the CRL facility (Silke et al. 2014). <u>The model provides a detailed assessment of the localized environment around the CRL outfall, and as such is not considered representative of the Ottawa River sediment in the Regional Study Area.</u>”</p> <p>[emphasis added]</p>	<p>If the model cited “... is not ... representative of the Ottawa River sediment in the Regional Study Area ...”, then the authors need to provide the information that is representative.</p>
57.	8-108 & 8-111	<p>Table 8.7-2. Ambient Gamma Radiation in Air at TLD Stations: Site and Local Study Areas (Source: Wills 2013). Locations are Illustrated in Figure 8.7-2 and</p> <p>The figure on Page 8-111.</p>	N/A	<p>There are several issues with this table.</p> <p>First – There is no figure labelled “Figure 8.7-2”, although the list of figures from the Table of Contents indicates that Figure 8.7-2 on Page 8-111.</p> <p>Second – There are three locations identified in this table, whereas the figure on Page 8-111 depicts four.</p> <p>Third – The units used are Roentgens (specifically μR). The appropriate SI unit is Gray (or in this case, μGy). This makes it very difficult to compare these levels with the benchmark dose rate used by CNL in their EcoRA TDS [17]. That level is defined as 400 $\mu\text{Gy/hr}$ [18]</p> <p>Fourth – The graphs in the figure on Page 8-111 depicting the trends in dose rate all use the yearly average. The yearly average is not provided in this table.</p> <p>Most of this information and data has no relevance to the ultimate goal of this project, which is to abandon the site after the 100-year IC period (see Comment 15 above).</p> <p>The authors need to focus on the important aspects of this project (i.e. demonstrating they can achieve unconditional clearance criteria at the end of the IC period as discussed in Comment 9 above) and refrain from including information, data and assessments designed to divert the reader.</p>

[17] Arcadis, *Ecological Risk Assessment Technical Supporting Document*, 64-509200-ASD-004, Revision 0, September 2017.

[18] UNSCEAR, *Sources and Effects of Ionizing Radiation. Annex E. Effects of Ionizing Radiation on Non-human Biota*, 2008.

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58.	8-111	The figure	N/A	<p>The four graphs that depict the trends associated with the 4 monitoring locations are almost useless. The vertical axes are not the same, thus making comparisons difficult.</p> <p>Further, it is not clear as to what the trends are supposed to represent. For example, is there any contribution to these ambient gamma rates from the NPD site itself, or is the contribution from NPD operations so small that these graphs depict only the ambient rates?</p> <p>See also Comment 57 above.</p> <p>Please revise.</p>
59.	8-116	8.8.3.1 Statistics Canada Health Profiles	N/A	<p>Thank you for an extensive review of the human health profiles in Ontario and Renfrew County, and Québec and Région de l’Outaouais. While these statistics are most interesting, they are completely irrelevant to the project under review.</p> <p>As far as I can determine, the authors have not provided any link between these statistics and the potential environmental effects from the physical activities associated with this undertaking.</p> <p>Please refrain from including information, data and/or assessments designed to divert the reader from evaluating the potential impacts from this undertaking.</p>
60.	8-119	Table 8.8-2. Health Characteristics Data for Renfrew County and District Health Unit and the Province of Ontario. Adapted from Statistics Canada Health Profile (2013)	N/A	<p>The inclusion of this table is an example of the authors’ egregious attempt to divert the reader. Few, if any, of the “characteristics” listed in this table can be linked to past activities or future activities at the NPD site.</p> <p>Without any clear links between the NPD decommissioning activities and the characteristics listed, this table is clearly designed to divert the reader.</p> <p>Please refrain from including information, data and assessments designed to divert the reader from evaluating the potential impacts from this undertaking.</p>

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61.	8-123	Table 8.8-4. Health Characteristics Data for Région de l'Outaouais (Health Region) and the Province of Quebec. Adapted from Statistics Canada Health Profile (2013)	N/A	<p>See Comment 60 above. The inclusion of this table is another example of the authors' egregious attempt to divert the reader.</p> <p>Please refrain from including information, data and assessments designed to divert the reader from evaluating the potential impacts from this undertaking.</p>
62.	8-129	8.9 Aboriginal Land and Resource Use	<p><i>Information for this section was derived from the Aboriginal Engagement Report (AER) TSD. <u>As noted in the AER TSD, engagement on traditional land and resource use has so far been limited.</u></i> [emphasis added]</p>	<p>With respect to the highlighted sentence, if Aboriginal Engagement has been limited, then the authors are non-compliant with Section 5(1)(c) of the CEEA (2012). To quote:</p> <p><i>Environmental effects</i></p> <p><i>5 (1) For the purposes of this Act, the environmental effects that are to be taken into account in relation to an act or thing, a physical activity, a designated project or a project are ...</i></p> <p><i>(c) with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on</i></p> <ul style="list-style-type: none"> <i>(i) health and socio-economic conditions,</i> <i>(ii) physical and cultural heritage,</i> <i>(iii) the current use of lands and resources for traditional purposes, or</i> <i>(iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.</i> <p>Until the proponent has truly engaged the local aboriginal groups with respect to these four items, and received the appropriate support, all decisions with respect to this undertaking must be considered tentative. As such, the EIS report is premature.</p> <p>The authors must ensure that the Aboriginal groups understand the differences among the three “alternative means”. Specifically the authors need to address the link between each alternative means and the long-term consequences to the four items listed above.</p> <p>See Comment 51 above. Until the Aboriginal engagement activities are complete, the proponent must consider withdrawing this draft of the EIS report.</p>

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63.	8-139	8.10 Socio-Economic Environment	<p><i>“Socio-economic baseline data was collected through a variety of sources. <u>These included Statistics Canada, Municipal corporations, planning documents, tourism boards, and provincial agencies.</u> Data was predominantly derived through desktop review of existing data ...”</i></p>	<p>Thanks again for providing an extensive review of the socio-economic baseline for this area. However, this review must be considered over-kill.</p> <p>First – Consider the following quoted from Page 3-2,</p> <p><i>“The site is in a remote area, with relatively low population density.”</i></p> <p>A remote site with low population density does not require an extensive review of socio-economic baseline.</p> <p>Second – Consider the following quoted from Page 3-10</p> <p><i>Main Building – The former purpose of the Main Building substructure was to house the reactor, ... has a building footprint of approximately 2,600 m².</i></p> <p>The footprint of the building, even if it entombed, is relatively small.</p> <p>Whatever option, chosen to address the residual activity in the NPD reactor, will not require a significant increase in local employment. Whatever those increases are, would be would be relatively short-term.</p> <p>The authors need to provide baseline information commensurate with the potential effects on the specific component being assessed.</p> <p>Please refrain from including information, data and assessments designed to divert the reader from evaluating the potential impacts from this undertaking.</p>
64.	9-2	9.1.1 Background	<p><i>“The EIS Guidelines (CNSC 2016a) state that predicted changes to the environment are to be considered in relation to each phase of the project (i.e., Decommissioning Execution, Institutional Controls and Post-Institutional Controls) ...”</i></p>	<p>The CNSC Guidelines do not include the terms “Institutional Controls” or “Post-Institutional Controls [12].</p> <p>The authors state, the site will be abandoned (see Comment 16 above). Once abandoned, all “... predicted changes to the environment ...” will result from natural processes.</p> <p>The authors need to focus on demonstrating that at the end of the IC period, the residual activity on the site will meet unconditional clearance criteria. An analysis of the potential changes, post-institutional controls, is meaningless.</p>
65.	9-4	Figure 9.1-2. DecomSA and PostSA Effects Integration into EIS	N/A	<p>See Comment 64 above. The PostSA is meaningless. The site will be abandoned. Thus all scenarios and “what if” cases will be “normal”.</p>

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66.	9--4	Paragraph following Figure 9.1-2	<p><i>The DecomSA, EcoRA and PostSA TSDs cover the following time frames:</i></p> <ul style="list-style-type: none"> <i>Decommissioning Execution phase – Decommissioning Safety Assessment (DecomSA) TSD and Ecological Risk Assessment (EcoRA) TSD.</i> <i>Institutional Controls and Post-Institutional Controls phases – Postclosure Safety Assessment (PostSA) TSD and EcoRA TSD.</i> 	<p>See Comment 10 above. An Ecological Risk Assessment cannot be substituted for an Environmental Assessment.</p> <p>As discussed above (see for example Comment 16 above), at the end of the IC period, the site will be abandoned. Therefore, the residual activity on the site must meet unconditional clearance criteria (see reference [8]).</p> <p>To prove the site can be abandoned, one does not need an ERA.</p> <p>Please delete all references to the ERA, and the EcoRA TSD itself.</p>
67.	9-6	Postclosure Safety Analysis (PostSA TSD), top of page	<p><i>“... documented in a report of the International Atomic Energy Agency’s (IAEA) Improving Safety Assessment Methodologies (ISAM) programme (IAEA 2004) and incorporated into a more recent safety guide (IAEA 2012). [emphasis added]</i></p>	<p>These two references are not included in Section 13, <i>References</i> in the draft EIS report.</p> <p>Please check all references.</p>
68.	9-8	Ecological Risk Assessment (EcoRA TSD) 2 nd paragraph, 2 nd sentence	<p><u>Ecological receptors are used as assessment endpoints, which are expressions of the actual environmental values to be protected.</u> <i>In general, the assessment endpoints selected in this study were healthy populations of the identified indicator species within the study area. SARs [species at risk] were considered on an individual level.</i> [emphasis added]</p>	<p>The authors need to explain how they know that the “<i>ecological receptors ... used as assessment endpoints ...</i>” and the “<i>species at risk</i>” will be present at the end of the 100-year IC. Without that knowledge, these assessment endpoints are purely speculative.</p> <p>(Note: for the short-term activities, such as preparing the site for entombment, an identification of these VCs may have some value. However, the proper use of the EA process that includes an assessment between those short-term physical activities and the environmental components would address this over a reasonably predictable period.)</p> <p>See Comment 10 above. An Ecological Risk Assessment cannot be substituted for an Environmental Assessment.</p>
69.	9-11	Table 9.1-1. Criteria for Classification of Residual Effects	Row – Duration/Timing of Effect	<p>As shown in this table, the effect level for any effect that “<i>Extends into the Post-Institutional Controls phase</i>” will be classified as “High”.</p> <p>This confirms that the goal of the project should be to ensure the residual activity would meet unconditional clearance criteria. If any residual effects were above these criteria, then the proponent has failed to demonstrate that the site can be abandoned at the end of the IC.</p> <p>In their assessment of residual effects for each of the components, the authors explicitly conclude “<i>no adverse residual effects</i>”. However, as discussed in Comments 27 above and 72 below, this conclusion cannot be supported.</p>

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70.	9-53, 9-87, & 9-111	9.4.4 Assessment of Residual Effects 9.6.4 Assessment of Residual Effects, 9.8.4 Assessment of Residual Effects	<p>The following statement is the same for all 3 sections.</p> <p><i>Based on the assessment described above, no adverse residual effects on the terrestrial environment have been predicted.</i></p>	<p>See Comment 72 below. These three statements have yet to be proven. Specifically, as discussed in Comment 27 above, the predicted adverse residual effects will be present well over 100,000 years into the future.</p>
71.	9--86	<p>Table 9.6-3. Summary of Residual Effects in the Terrestrial Environment</p> <p>The two rows associated in Institutional Controls and Post-Institutional Controls</p>	<p>Under the column headed “Potential Effect” the authors state:</p> <p><i>Groundwater will flow into the eventually degraded structure. Contaminated groundwater may flow out and eventually into the Ottawa River. This may be transferred to soil through irrigation, and biota through drinking water.</i></p> <p>Under the column headed “Proposed Mitigation” the authors state:</p> <p><i>In-design mitigation to isolate and contain the inventory in order to reduce the potential of groundwater contamination and effects in the terrestrial environment.</i></p>	<p>The authors need to provide the evidence that the proposed “<i>In-design mitigation ...</i>” addresses the “<i>Potential Effect</i>”, i.e. “<i>Groundwater ... flow into the eventually degraded structure ...</i>”</p> <p>Since the effect results from the “degraded structure”, what are the proposed measures that will mitigate the eventual degradation of the structure?</p> <p>Please provide details as to the measures that will address natural degradation.</p>

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72.	9-86	<p>Table 9.6-3. Summary of Residual Effects in the Terrestrial Environment</p> <p>The two rows associated in Institutional Controls and Post-Institutional Controls</p>	<p>Under the column headed “Potential Effect After Mitigation” the authors state:</p> <p><i>Radionuclides are expected to be within acceptance criteria.</i></p>	<p>Assuming that by the use of the term “acceptance criteria”, the authors are referring to the public dose limit (1 mSv/yr). If this assumption is correct, then the statement “<i>Radionuclides are expected to be within acceptance criteria</i>” cannot be true.</p> <p>The following table is copied from reference [19]. It depicts the public dose acceptance criteria and confirms that it is 1 mSv/yr.</p> <div data-bbox="1066 435 1900 862" style="border: 1px solid black; padding: 5px;"> <p align="center">Table 3-1 Operational and Public Dose Limits for Normal Storage with Surveillance Activities</p> <table border="1"> <thead> <tr> <th rowspan="2">Application</th> <th colspan="2">Dose Limit</th> </tr> <tr> <th>Occupational</th> <th>Public</th> </tr> </thead> <tbody> <tr> <td>Effective Dose⁽¹⁾</td> <td>50 mSv a⁻¹ and 100 mSv in 5 years</td> <td>1 mSv a⁻¹</td> </tr> <tr> <td colspan="3">Annual equivalent dose in:</td> </tr> <tr> <td>• The lens of the eye</td> <td>150 mSv</td> <td>15 mSv</td> </tr> <tr> <td>• The skin</td> <td>500 mSv</td> <td>50 mSv</td> </tr> <tr> <td>• The hands and feet</td> <td>500 mSv</td> <td>50 mSv</td> </tr> </tbody> </table> <p>⁽¹⁾ For pregnant Nuclear Energy Workers, the annual effective dose limit is 4 mSv.</p> </div> <p>However, as discussed in Comment 27 above, the 1 mSv/yr dose limit will not be achieved until about 80,000 years from the end of the IC period.</p> <p>Unless the authors are prepared to consider an 80,000-year Institutional Control period, the assertion, “<i>Radionuclides are expected to be within acceptance criteria</i>”, cannot be made. Therefore, their conclusion “No adverse residual effects” is unsupported.</p> <p>The authors must refrain from making assertions that cannot be supported by their own evidence.</p> <p>See Comment 9 above. The ultimate goal of the project should be to meet unconditional clearance criteria at the end of the IC period. Please revise this statement to reflect that the proposed “in-situ decommissioning” of NPD will not meet unconditional clearance criteria without an unrealistic IC period of more than 100,000 years..</p>	Application	Dose Limit		Occupational	Public	Effective Dose ⁽¹⁾	50 mSv a ⁻¹ and 100 mSv in 5 years	1 mSv a ⁻¹	Annual equivalent dose in:			• The lens of the eye	150 mSv	15 mSv	• The skin	500 mSv	50 mSv	• The hands and feet	500 mSv	50 mSv
Application	Dose Limit																							
	Occupational	Public																						
Effective Dose ⁽¹⁾	50 mSv a ⁻¹ and 100 mSv in 5 years	1 mSv a ⁻¹																						
Annual equivalent dose in:																								
• The lens of the eye	150 mSv	15 mSv																						
• The skin	500 mSv	50 mSv																						
• The hands and feet	500 mSv	50 mSv																						

[19] Athauda-Arachchige, H., *Safety Analysis Report for the Nuclear Power Demonstration Waste Management Facility*, 64-03610-SAR-001, Rev 3, February 2015.

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73.	9-129	9.9.4 Assessment of Residual Effects	<i>Based on the assessment described above, no adverse residual effects on the terrestrial environment have been predicted.</i>	See Comment 62 above. Without agreement from the Aboriginal groups, the authors cannot make this assertion. Please delete.																
74.	9-148	Table 9.11-3. Non-Radiological Criteria – Worker Receptors – Accidents and Malfunctions	This table contains a list of 5 chemicals	The authors need to explain why only these 5 chemicals are of concern in an accident and malfunction event. Surely, many other chemicals could present a hazard to workers during the postulated event. What sampling and analytical methods will be used to ensure the worker’s exposure is below these values? I note that dioxins and furans can be produced from the combustion of all organo-chlorinated compounds (not just PCBs). Their production in a fire situation is critically dependent on the temperature of combustion. However, their production in a fire is not the only source. They are also by-products in the production of chlorinated pesticides and herbicides. As such, they are trace contaminants in these products and are widely distributed in the environment. Thus, it is not clear how the proponent intends to distinguish between background dioxins and furans and those resulting from a fire-related accident. The authors have failed to address the potential for adverse environmental effects resulting from potential dispersal of these 5 chemicals due to the fire. Please assess impacts to the non-human biota receptors.																
75.	13-1	Section 13 – References	Eight references in this section whose date precedes the formation of CNL include the statement “Prepared for CNL”.	<table border="1"> <tbody> <tr> <td>1.</td> <td>MacLarentech Inc. 1990. Rolphton NPD Waste Management Facility Site Characterisation and Facility Evaluation. Project No. 703725. Prepared for CNL, February.</td> </tr> <tr> <td>2.</td> <td>Ontario Power Generation. 1999. Ottawa River Dam Break and Inundation Mapping Study, Final Report, Volume 1. 64-10150-226-001-0001, R-DSP-08410-1-00-01103-0001. Prepared for CNL, December.</td> </tr> <tr> <td>3.</td> <td>Paterson Group Inc. 2012. Groundwater Sampling and Testing, NPD Waste Management Facility, AECL Candu Site, Rolphton, Ontario. Prepared for CNL by M.S. D’Arcy, 22 August.</td> </tr> <tr> <td>4.</td> <td>Silke, R., M. Bond, J. Olfert, D. Rowan, M. Audet, A. Ethier, and D. Lee. 2014. Chalk River Laboratories Ottawa River Sediment Remediation Assessment – Refined Conceptual Site Model. 175-121250-REPT-02. Prepared for CNL, March.</td> </tr> <tr> <td>5.</td> <td>Turner, W. 2008. Chalk River Laboratories: A description of the Environmental Baseline for Environmental Assessments. CRL-509200-ENA-001. Prepared for CNL, August.</td> </tr> <tr> <td>6.</td> <td>Verney, B. 2011. NPD Waste Management Facility Annual Compliance Report for 2010. 64-00521-REPT007. Prepared for CNL, February.</td> </tr> <tr> <td>7.</td> <td>Verney, B. 2009. NPDWMF Annual Compliance Report for 2008. 64-00521-REPT-005. Prepared for CNL, February.</td> </tr> <tr> <td>8.</td> <td>Wills, A. 2013. Nuclear Power Demonstration Site: A Description of the Environmental Baseline for Decommissioning. 64-509200-ENA-001. Prepared for CNL, February.</td> </tr> </tbody> </table> <p>As the proponent/authors should know, CNL was incorporated in June 2016. Thus the eight references included in the list above with publication dates preceding June 2016 could not have been “Prepared for CNL”.</p>	1.	MacLarentech Inc. 1990. Rolphton NPD Waste Management Facility Site Characterisation and Facility Evaluation. Project No. 703725. Prepared for CNL , February.	2.	Ontario Power Generation. 1999. Ottawa River Dam Break and Inundation Mapping Study, Final Report, Volume 1. 64-10150-226-001-0001, R-DSP-08410-1-00-01103-0001. Prepared for CNL , December.	3.	Paterson Group Inc. 2012. Groundwater Sampling and Testing, NPD Waste Management Facility, AECL Candu Site, Rolphton, Ontario. Prepared for CNL by M.S. D’Arcy, 22 August.	4.	Silke, R., M. Bond, J. Olfert, D. Rowan, M. Audet, A. Ethier, and D. Lee. 2014. Chalk River Laboratories Ottawa River Sediment Remediation Assessment – Refined Conceptual Site Model. 175-121250-REPT-02. Prepared for CNL , March.	5.	Turner, W. 2008. Chalk River Laboratories: A description of the Environmental Baseline for Environmental Assessments. CRL-509200-ENA-001. Prepared for CNL , August.	6.	Verney, B. 2011. NPD Waste Management Facility Annual Compliance Report for 2010. 64-00521-REPT007. Prepared for CNL , February.	7.	Verney, B. 2009. NPDWMF Annual Compliance Report for 2008. 64-00521-REPT-005. Prepared for CNL , February.	8.	Wills, A. 2013. Nuclear Power Demonstration Site: A Description of the Environmental Baseline for Decommissioning. 64-509200-ENA-001. Prepared for CNL , February.
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**Comments on draft EIS for “Nuclear Power Demonstration Closure Project”
(Registry Number 80121)**

#	Page	Section	EIS Quote or Reference	Comment/Question
				<p>What drew my attention to this is Report #5 in the table above. I am the author of that document; therefore, I should know something about it. One thing I do know is that I did not prepare it for CNL.</p> <p>The following figure contains the copyright notice. As one can see, the report was prepared for AECL, and its distribution is “Unrestricted”. However, the copy provided to me by CNL in response to my request for references contains several redactions.</p> <div data-bbox="1018 446 1213 673" style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>2008/08/13 UNRESTRICTED</p> <p>©Atomic Energy of Canada Limited</p> <p>2251 Speakman Drive Mississauga, Ontario Canada L5K 1B2</p> </div> <p>The authors need to explain the use of the phrase “<i>Prepared for CNL</i>”, when the date on this document clearly indicates otherwise. Further, an explanation of why redactions were made to a document whose distribution is clearly identified as “Unrestricted”. This is especially true, since the document was previously publically available.</p> <p>It is beyond the scope of this review to check the other references listed above whose dates indicate they could not have been “<i>Prepared for CNL</i>”.</p>

**Comments on draft EIS for “Nuclear Power Demonstration Closure Project”
(Registry Number 80121)**

#	Page	Section	EIS Quote or Reference	Comment/Question
76.		General	Sections 10 through 12	<p>I have not spent any more time reviewing the draft EIS. The flaws in the report described above are such that providing comments on these three sections is a waste of time.</p> <p>To update my conclusion from my previous submission [6]:</p> <p><i>“Please instruct CNL to withdraw their draft EIS report and provide a revised report that addresses ... the provisions of CNSC’s Generic Guidelines for the Preparation of an Environmental Impact Statement ...”</i></p> <p>The draft EIS must be withdrawn to address the following deficiencies (among several others discussed above) . The authors need to</p> <ul style="list-style-type: none"> • provide an appropriate evaluation of alternative means, • acknowledge that entombment will never be free of adverse environmental impacts (that is, the site can never be abandoned and Institutional Controls will be required in perpetuity), • address that both public and Aboriginal engagement as more than just a one-way “announcement” process (engagement is a two way process), • address the requirements of the EA process and remove any confusion and conflation of the ERA, and PA processes, • remove the considerable amount of irrelevant and extraneous information, that makes the review of the draft difficult and time consuming (there are over 3,100 pages in the document including all the various TSDs. That total does not include the actual references listed in Section 13 of the report), and • follow simple document QA <p>If the proponent wishes to proceed with this undertaking, then this document requires a total rewrite.</p>