

Comments on the “Project Description - Near Surface Disposal Facility at Chalk River Laboratories” (Registry Number 80122)

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By W. Turner (Concerned Deep River Resident)

General Concerns

It appears that CNL is applying the “Decide-Announce-Defend” approach to public engagement. This is somewhat surprising since Canadian, US and international experience (of which CNL must be fully aware) suggests this approach will not bode well. I cite their Near Surface Disposal Facility (NSDF) web page (and other communication activities) as evidence of this communication strategy. Having decided on and announced the NSDF, CNL is now in the unenviable position of having to defend its choice.

Concerns with the NSDF Key Points as Provided by CNL (the Proponent)

CNL makes 4 key assertions about the NSDF project that are described on their Web Page (<http://www.cnl.ca/en/home/e-stewardship/nsdf/key-points.aspx>). These assertions are: proven technology, environmentally sound, safe and a solution for CRL legacies. Each of these assertions is suspect, thus likely misleading.

Even though these 4 Key Points may not be specifically addressed in the project description document, they do reveal the framework in which CNL has defined both the problem and the proposed solution (i.e. the NSDF). Thus they are crucial to the understanding of the project description document.

Let us look at each of the Key Points in turn.

1. “It’s proven technology”

Although CNL provides several examples where the technology has been implemented, none of these can be cited as proof of the technology. As of today, those that are operational, have only operated for a couple of decades or so. In other words none of the facilities have been shown to last even 50 years, let alone the 300 years projected for the NSDF. Let us look at each of the examples cited by CNL.

- (A) **Fernald Preserve, Hamilton, Ohio, USA.** It is my understanding that this facility is designed to manage wastes from “... *former Feed Materials Production Center, a uranium processing facility that produced high-purity uranium metal products as the first step in America’s nuclear weapons production cycle*”. It is not clear to me that these wastes are similar to the wastes being proposed for emplacement in the NSDF. Since uranium processing to produce high-purity uranium never occurred at the CRL site, any comparison between wastes that are now emplaced in the Fernald facility and those envisioned for the NSDF is not valid. Therefore, providing this as an example of what is being proposed is somewhat misleading.
- (B) **Integrated Disposal Facility, in Richland, Washington, USA.** What are the characteristics of the area in which this facility is located? The photographs of this facility (available from <http://www.hanford.gov/page.cfm/IDF>) show that the predominant characteristic of the area in which this structure is located is essentially desert. If there is one overriding characteristic of the CRL site, it is not arid. Therefore, providing this as an example of what is being proposed is also misleading.
- (C) **Low Level Waste Repository, in Cumbria, UK.** A cursory look at the overview of the WAC for this facility (available from <http://llwrsite.com/customer-portal/resource/waste-acceptance-criteria->

[overview-wsc-wac-ovr-version3-0-ap/](#)) suggests that several categories of wastes will require pre-treatment before being accepted. These include pre-treating supercompactable, combustible, and metallic wastes. Since CNL provides minimal information about the wastes to be managed in the NSDF, it is not clear whether pre-treatment facilities would be required. If they are, then the scope of NSDF is totally inadequate since it does not address these prerequisites. Therefore, providing this as an example of what is being proposed is also misleading.

- (D) **Centre de L’Aube, France.** Are the radioactive wastes that this facility is designed to manage similar to those for the NSDF? The description of the facility (downloadable from <https://www.andra.fr/download/andra-international-en/document/editions/379fva.pdf>) states explicitly that the facility “... is licensed for the disposal of 1 million cubic metres of low- and intermediate-level, short-lived waste packages.” Although the volume of the wastes for the French facility is the same as that for the NSDF, the characteristics of that waste do not appear comparable. CNL provides no commitment that their proposed wastes will be packaged or that the radiological nuclides will be short-lived. Therefore, providing this as an example of what is being proposed is also misleading.
- (E) **Rokkasho, Japan.** A cursory look at the low-level waste disposal process given for the disposal site (available at http://www.jnfl.co.jp/en/about/publication/file/llw_disposal_center.pdf) shows that all the wastes are drummed. Again, CNL does not provide information about acceptable waste forms for the NSDF. Therefore, providing this as an example of what is being proposed is also misleading.

Although each of these facilities use (or propose to use) impermeable liners and covers, that appears to be the extent of similarity of these examples to the proposed NSDF. Thus one can safely say that the use of impermeable liners and covers have been implemented at several sites around the world. That said, implementation is not proof. To assert the technology is proven is deliberately misleading (which, by the way, is not semantics).

2. “It’s environmentally sound”

Unless one predetermines the outcome of an environmental assessment (EA), CNL cannot assert that the proposed undertaking is “environmentally sound”. An assertion like this, before the EA is even started, presupposes the conclusion and suggests an unacceptable bias on the part of CNL. What will CNL do if the conclusion of the EA process determines the environmental impacts are unacceptable?

From a brief review of the project description, the project will be covering an area of about 30 ha with impermeable liners and covers. At first glance, this is a significant and adverse environmental impact. Until the EA is completed, I cannot say whether that impact would be acceptable, but somehow I doubt it.

3. “It’s safe”

While I agree that construction activities can be conducted to ensure little risk to the public or the environment, I see no evidence that this would apply to the operational activities or could be guaranteed after the facility is closed and put under institutional control for 300 years. There is no evidence that CNL has done an analysis in accordance with the CNSC Regulatory Guide, G-320, *Assessing the Long Term Safety of Radioactive Waste Management*. Thus an assertion like this, before the safety case is even started, presupposes the conclusion and suggests an unacceptable bias on the part of CNL. What will CNL do if the conclusion of the safety assessment determines the facility, over its 300 year plus lifetime, cannot be operated safely?

4. “A solution for CNL’s legacy obligations”

While I agree that the NSDF is a solution, I am not sure what the problem is for which this is the answer. CNL needs provide a clear definition of the problem that needs to be solved. Since the facility is supposedly being designed for a “*variety of waste materials*”, it will not be designed for all of “*CNL’s legacy obligations*”. Because no description of the “*variety of waste materials*” is postulated, it is not clear that what is being proposed is even the appropriate solution for this “*variety of wastes*”. Again, an assertion is given without any supporting evidence.

In addition, under this heading CNL also asserts that the NSDF will “...*reduce the footprint of the built up area on the CRL site...*” While it may be true that over 100 buildings will be removed, the actual footprint will not be reduced. This is especially true, since in the next clause CNL asserts the facility will “... *create the appropriate conditions for a clean and revitalized science and technology campus.*” I suggest that this campus will be situated on the current “... *footprint of the built-up area...*” If it isn’t, then the footprint will be expanded. Therefore there will be no footprint reduction.

In summary

CNL appears to have decided on a technology without a thorough examination of the appropriateness of that technology. To compound the issue of choosing a correct solution, there is no clear problem definition. Without a proper definition, any proposed solution is OK. To paraphrase the Cheshire Cat in Alice in Wonderland, “*If you do not know where you are going, it does not matter what road you take*”. This is **not** an approach that I would expect of a technologically sophisticated company.

It appears that CNL’s primary concern is to have this facility up and operational by the year 2020 (four years from now). All other issues are seen as secondary, or tertiary, or even worse, as impediments. Thus they are not given proper consideration. Recall, the proposed undertaking is for a nuclear waste “*disposal*” site, something that is supposed to last forever. For an undertaking that is supposed to last forever, dismissing issues in the name of speed cannot be justified.

Since CNL has failed to clearly define the problem to be addressed by this undertaking and has not engaged the public in any serious way, I recommend that CNL withdraw this proposal.

I also recommend that before proceeding with the EA process, CNL must devote more resources to defining and documenting the problem (or problems), determining alternative means to address that problem and conducting an unbiased assessment of the alternative means to determine the best option or options. In all these steps, CNL must make a concerted effort to engage the local population and concerned citizens.

If CNL wishes to proceed with the project as described, then the following comments must be addressed.

General Comments

(1) Note: disposal is forever. The proponent will need to demonstrate that the project meets the requirements of the CNSC Regulatory Guide, G-320, *Assessing the Long Term Safety of Radioactive Waste Management*. Since the description document makes no reference to this guideline, it is not clear whether the proponent understands the importance of this guidance.

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(2) Since disposal is forever, public engagement in the decision process is critical. From public engagement activities identified in this document (Sections 2.3 and 2.4), the proponent appears to have given little opportunity for the public to seriously participate in process. These sections appear to address only the activities associated with the announcement of the project. Given the nature of the stakeholder groups listed in Table 2-1, the proponent appears to have deliberately limited the opportunity for public feedback. I suggest that most of these groups have an economic interest in ensuring that CNL will succeed. Further, they are unlikely to have sufficient knowledge to raise issues on behalf of their members, and therefore, will defer to the expertise of the proponent. Therefore, they are unlikely to question any initiatives at the CRL site. Since querying by this audience is not expected, the proponent can safely limit the communication activities to announcements for these groups.

However this communication strategy cannot be seen as acceptable when the object is to engage the general public. It appears that the proponent wants to preclude the general public from raising questions about a proposal that has irreversible implications to the CRL site, and the future of this community.

I suggest that the proponent is fully aware that this narrow focus is inconsistent with current Canadian practice for similar long-term waste management facilities. For example, in the developing the management strategy for the historic LLW in the Port Hope area (a project for which the proponent is now responsible), the general public was deliberately targeted for engagement. As the proponent should know, from the initial identification of the problem in the early 1970s to the formation of the Low-Level Radioactive Waste Management Office (1982) to the implementation of the Port Hope Area Initiative (2001), the general public has been and remains heavily engaged.

With respect to Canadian precedents, one must not forget that the LLRWMO developed several “alternative means” for managing Canada’s historic low-level wastes. One of these resulted in the *Siting Task Force on Low-Level Radioactive Waste Management (STF)*. The STF identified the CRL site as a potential location for the repository and the local community was heavily involved. As I recall, the STF had storefront offices located in downtown Deep River. As part of their mandate, the STF conducted several characterization studies of the CRL site, the results of which still form the basis for describing the environmental features of the property. As far as I can discern, this project has done very little to determine the suitability of either chosen site, or the CRL site as a whole.

In summary, the description of the public consultation initiatives given in Section 2.3 and 2.4 are totally inadequate since they appear to focus on an announcement strategy. It suggests that the proponent wishes to short cut the public engagement process even though the proponent is fully aware of Canadian precedents (e.g. one of the PHAI projects (Port Granby) is cited as a design example in Section 3.3). The proponent has provided no justification as to why the public consultation/engagement process should be truncated.

The proponent must revise its communication process to ensure the public is given a meaningful opportunity to participate in the planning process.

(3) It is my understanding that the Nuclear Safety and Control Act makes no provision for a “disposal” licence. The word does not appear under *Prohibitions*, Section 26 of the Act which states:

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“Subject to the regulations, no person shall, except in accordance with a licence,

(a) possess, transfer, import, export, use or abandon a nuclear substance, prescribed equipment or prescribed information; ...

(e) prepare a site for, construct, operate, modify, decommission or abandon a nuclear facility; ...”

Under current legislation, the only licence that would be available at the end of the institutional control period (which is not really addressed in this project description document) is a licence to abandon. To comply with the regulatory guide G-320, *“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”* (Section 7.4, Assessment Time Frames, CNSC Regulatory Guide, G-320, page 24). At the time of the application for a licence to abandon, the residual radioactivity at the disposal site will have to meet clearance criteria. Although this is a CNSC licence, the regulatory concern does not end with this licence. Since hazardous materials, or mixed waste are to be emplaced in this facility (see Section 7, third paragraph), the proponent will also need to demonstrate that after the licence to abandon is issued by the CNSC, the site will meet the requirements for the closure of a hazardous waste management facility under provincial regulations.

Please provide an estimate of the timeline at which the radioactivity of the closed disposal site will meet the clearance levels required for abandonment. In this estimate, the proponent needs to address any timelines associated with any provincial closure regulations.

(4) The proponent appears to advocate implementation of a short-term solution to a longer term problem. However, I cannot see that the proposed solution is justified since there is no clear definition of the problem. In Section 3.1.1, the proponent asserts that there is an *“immediate requirement for a new facility ... for the disposal of large quantities of LLW ...”* but provides no justification for this assertion. Why is the need “immediate”?

The proponent then asserts *“The urgency for the NSDF is rooted in the requirements established by AECL, on behalf of the Government of Canada, to substantially reduce the risks associated with the CNL legacy wastes, liabilities and the cost of laboratory operations to taxpayers in the 10-year period 2016-2025 and to create the conditions for the revitalization of the CRL site.”* Again no justification is provided.

Let us look at each of the requirements in the quote above. First, *“...to substantially reduce the risks ...”* What is the nature of those risks? Given the various reports on the environmental performance and worker safety at the CRL site (reports submitted annually to the CNSC as part of the CRL licence), those risks do not seem to be unacceptable. If there are risks that could be considered unacceptable, they are usually highly localized, and short term, and can be dealt with as a small scale problem. Since the risk is already low, it will be very difficult and expensive *“... to substantially reduce the risk”*. As to whether this facility will address the “urgent need to reduce risk”, it will fail. The time frame for commencing operations is four years from now. And that is only to start operations. It will likely take several years before it can make any impact on risk reduction. Therefore if the need is urgent, what alternative means has the proponent considered? Since no evidence is provided that any alternative to address this imperative has been identified, this suggests that even the proponent does not consider reducing risk as being crucial. I suggest that the risk is sufficiently low such that risk reduction cannot be used as a justification for the project.

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Second: “... to substantially reduce the ... cost of laboratory operations ... in the 10 year period ...”. What is the current cost of laboratory operations? Why is the period of 10 years chosen? For a proper assessment of the costs, the costs of the laboratory operations must be extended beyond the 10 years to at least the project time line given in section 3.4, which is to the year 2400. What is the cost of this project over the complete life-cycle (including the costs for design, building, operations and closure and the cost of maintaining any institutional controls, maintenance and monitoring activities post closure up to at least the year 2400)? Without this information, this requirement remains an assertion and cannot be used to justify the project.

Third: “...to create the conditions for the revitalization of the CRL site.” What are these conditions? Again the required information is lacking and this remains as an assertion, not a justification.

From the above, I am at a complete loss as to the justification and rationale provided by the proponent for this undertaking. Further, I cannot evaluate the proposed undertaking since I am not clear as to the problem the proponent wants to address.

In order to properly evaluate the proposed undertaking, the proponent must provide a clear definition of the problem. This definition must be provide the evidence that there is actually a problem and not just make assertions. Assertions are not evidence. Without the appropriate information, the proposed solution cannot be evaluated as to its suitability.

In summary, to quote H.L. Mencken – “For every problem there is a solution which is simple, clean and wrong.”

(5) This project description does not identify or consider “*alternative means of carrying out the project*”. As such, I cannot determine whether or not this proposed undertaking is the optimum solution. I note that each of the two other project descriptions recently submitted by the proponent (*the NPD Closure Project*, CEA Registry Number 80121, and *In situ decommissioning of the Whiteshell Reactor # 1*, CEA Registry Number 80124) contain discussions of alternative means. Thus the fact that this document does not identify or consider “alternative means” is somewhat disappointing.

The lack of a discussion of “*alternative means of carrying out the project*” suggests that the proponent has predetermined the solution, thus risks being out of compliance with clause 19(1) (g) of the CEA (2012).

Please include a description of the alternative means, along with criteria used to select the NSDF as the best option.

(6) I note that this project only addresses the LLW from CRL (with some provision to handle the wastes from the NPD and Whiteshell sites). However, all CNL sites contain wastes other than LLW. How is this project integrated into the overall strategy to manage all wastes at CNL sites? What are the other CNL waste projects either underway or planned?

Recall that under Section 19 (1) (a) “Factors to be considered in an EA” states:

*“the environmental effects of the designated project, including the environmental effects of ... **any cumulative environmental effects** that are likely to result from the designated project in **combination with other physical activities that have been or will be carried out;**”[emphasis added]*

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Without knowing the nature of these current and future projects, it is not clear that the proponent has adequately addressed the evaluation of cumulative effects. Further, I suggest that the proponent has not provided an adequate description of the context of the project.

(7) What is the potential impact to the environment from either of the sites selected? The proponent states that the area of each of the two potential sites is about 30 ha. To put this into perspective, it is my understanding that the built-up area occupies about 70 ha. Essentially an expanse equivalent to 43% of the built-up zone will be directly impacted by the installation of the impermeable liners and covers.

What is the result of the installation of these engineered barriers? Clearly the whole local groundwater and surface water discharge regimes will change. As a result, the hydrology under the facility and, by extension, the surrounds will be altered. These transformations will impact the local ecosystem resulting in adverse effects to the existing flora and fauna both inside and outside the actual facility footprint.

Just from the size of the facility alone (approximately 30 ha) that is to be covered by impermeable liners and covers, one can predict that these effects will be significant and adverse. I am disappointed that the proponent has not identified these obvious impacts.

I suggest that the proponent's assertion that the proposed undertaking is "... environmentally sound ..." is unjustified (see also *Concerns with the NSDF Key Points as provided by CNL* above).

Specific Comments

1) Section 1.1 – Project Proponent (First paragraph)

"[AECL] ...fulfils this mandate through a long-term contractual arrangement with Canadian Nuclear Laboratories (CNL) ..."

It is my understanding that the contract with CNL is for 6 years with the option to renew for a further 4 years. This timeframe does not meet what I would consider "long-term".

Please revise, a 10 year contract is not long-term.

I am concerned that at the end of this contract, the government will be left with a problem for which the contractor cannot be held responsible. As such, I suggest that for a project whose lifetime extends beyond the current contract, the proponent cannot be CNL. With a project lifetime up to the year 2400 (see Section 3.4), either the government itself (i.e. through NRCan) or AECL must be the proponent.

2) Section 1.1 – Project Proponent (Second paragraph)

"Canadian Nuclear Laboratories is a private-sector company ..."

From the CNL website it is stated: "CNL is Canada's premier nuclear science and technology laboratory managed by Canadian National Energy Alliance". Apparently, CNL is not actually a company but a "Laboratory". Management of this entity is by a consortium of several private companies entitled, *Canadian National Energy Alliance (CNEA)*. Please confirm. If it is not a single company please revise this statement and identify which of the companies within the CNEA is responsible for this proposal.

3) Section 2.1 - Project’s Name, Nature and Proposed Location (Last paragraph on Page 2-2)

“A site selection process has identified two candidate sites to locate the NSDF, called the East Mattawa Road (EMR) Site, and the Alternate Site ...”

Please provide a summary of the criteria used for the site selection process. Please include a summary of the results of the evaluation.

Was the potential impact from the installation of impermeable liners and covers over the very large area (30 ha) considered in the selection process? (See also Comment 21) below). If not, please provide a justification.

4) Section 2.3 – Description of Consultation Activities

Please provide a copy of the *“...a brief overview of the proposed NSDF within the context of a larger vision of the company.”* Without the information it is not clear that the “overview” included a description of *“...the risks to public health, safety and security, and the environment posed by the facility or activity ...”* as required by the CNSC document, RD/GD-99.3, *Public Information and Disclosure*, March 2012, page 3.

5) Section 2.3.1 – Future Engagement Activities

This section does not meet the requirements of Section 2.2.2 *Target audience(s)* of the CNSC document, RD/GD-99.3, *Public Information and Disclosure*, March 2012. To quote the first sentence in that section, *“The public information program shall define the target audiences, and the rationale utilized for inclusion.”*

Although a target audience is identified for these future engagement activities, please summarize the rationale used to determine their inclusion.

6) Section 2.3.1 – Future Engagement Activities (Top of page 2-6)

The list of activities provided in this section are all related to announcing the project. There does not appear to be any effort to engage the population of the local communities in any of the decisions related to this project. As stated above, disposal is forever. Thus limiting the communication efforts to announcements to elected officials and special interest groups cannot be considered sufficient. This land belongs to all Canadians. With this ownership responsibility comes the obligation to engage Canadians in any decisions with respect to long-term uses, specifically nuclear waste disposal.

I note that the two Canadian long-term waste management sites in the Port Hope area were designed specifically for the historic radiological wastes being emplaced therein. In other words, a problem was identified, alternative solutions were evaluated, and the final design was proposed, all with significant public engagement.

Please ensure the public is engaged in any decisions related to this project. Two Canadian examples come to mind, both of which are located in the Port Hope area of Ontario. One of these, Port Granby, is cited as a design example in Section 3.3.

The proponent should follow the precedent set by AECL in the implantation of the Port Hope Area Initiative. From the initial identification of the problem early 1970s to the formation of the Low-Level Radioactive Waste Management Office (1982) to the implementation of the Port Hope Area Initiative (2001) the public have been engaged. Since AECL has the appropriate experience in public engagement, the proponent can neither claim ignorance nor an inability to implement the process.

7) Section 3.1.1 - Project Context (First Paragraph)

“Canadian Nuclear Laboratories has an immediate requirement for a new facility at its CRL property for the disposal of large quantities of LLW generated from past, present and future activities ...”

Please provide the evidence to support the assertion that this need is immediate. See *General Comments* above.

What were the alternative means that were considered that would address this immediate need?

8) Section 3.1.1 - Project Context (2nd Paragraph)

“The urgency for the NSDF is rooted in the requirements established by AECL, on behalf of the Government of Canada, to substantially reduce the risks associated with the CNL legacy wastes, liabilities and the cost of laboratory operations ...”

Please summarize the risks that require substantial reduction. As far as I am aware, there are no substantial risks associated with CRL waste management operations as identified by the regulator, (CNSC, *CNSC Staff Report on the Performance of CNL’s Nuclear Sites and Projects: 2013*, March 2015, Ottawa.)

With respect to the liabilities and operational costs, please provide the cost estimates such that the current costs can be compared to the costs of this project (over its complete life cycle, including post closure). See *General Comments* above.

Please provide the evidence to support the risk reduction assertion. Again, what are the alternative means that can address these substantial risks?

9) Can Section 3.1.1 - Project Context (2nd Paragraph)

“Canadian Nuclear Laboratories will also close the Whiteshell Laboratories and Nuclear Power Demonstration (NPD) prototype reactor sites ... The NSDF project will provide the asset [sic] to dispose of the LLW resulting from the aforementioned actions ...”

The statement that the NSDF will dispose of LLW from the closure of the WL and NPD reactors appears to be inconsistent with the EA Project Descriptions for those projects. Neither of those closure projects identify the NSDF as a potential waste disposal site. This is somewhat surprising since CNL is the proponent for all three projects, this one, and the closure of the two reactors. Further, all three projects are being brought forward at the same time.

Please confirm that the scope of the wastes to be emplaced in the NSDF includes wastes from the closure of the two reactor sites.

10) Section 3.1.2 – Project Objectives (First Paragraph)

The objective for the project is stated as: “...to design, licence, construct and commission the NSDF for operation.” This is a list of project outcomes, and cannot be considered project objectives. This statement implies that once the NSDF is commissioned there is no longer a need for the project. I doubt that this is what the proponent intends.

Please revise the list to address the actual objectives of the project. In other words, please answer the question, what is the problem this project will be designed to solve? From a clear problem definition, the proponent can then develop appropriate project objectives.

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Note: This problem definition needs to identify the type of wastes to be emplaced in the facility, including radiological content, non-radiological content (including organic content), inventories, packaging, and other such waste characteristics. It is not sufficient to use the generic term of LLW to describe these wastes and leave it to the future to determine the waste acceptance criteria. The design of the containment system is critically dependent on the characteristics of the wastes (i.e. waste acceptance criteria).

11) Section 3.1.2 – Project Objectives (Second Paragraph)

I note that the last sentence in bullet c) states that the future wastes will include “...*the remediation of soils from the **final closure of the CRL site*** [emphasis added]” and the first sentence of this paragraph states “*The facility is expected to be operational for approximately 50 years.*” This implies that the CRL site will be closed within 50 years.

Please confirm that the CRL site will be closed within 50 years.

12) Section 3.1.2 – Project Objectives (Second Paragraph)

“The NSDF will be sized to hold 1 000 000 m³ of LLW”

Please provide a summary of the calculations (estimates) used to determine the proposed capacity. Without appropriate evidence, this volume assertion is meaningless.

The doubts about the capacity estimate extend to the assertion that 50% of the wastes will be expected from current activities and 50% from future activities.

Please provide the basis for these estimates.

13) Section 3.1.2 – Project Objectives (Second Paragraph)

I note that the type of wastes to be emplaced in this facilities includes decommissioning wastes, contaminated lands and soils.

Please provide a summary of the characteristics of these wastes including waste forms.

What is the proposed waste form for the contaminated soils? Will it be in containers? Please provide a description of these containers. For example, some contaminated soil and decommissioning wastes are currently managed in containers in the SMAGs facilities on the CRL site. As I understand the situation, these containers are slowly corroding. Will these rusty containers be acceptable for direct transfer to this facility, or will the wastes contained therein have to be repackaged?

I note that the figures depicting the conceptual design of the facility that include a cross-section of the wastes (Figures 3-1 and 3-2) do not show the use of waste packages. I take this to mean that the acceptable waste forms will not include any packaging. Please confirm. If packaging is acceptable, what is the nature of that package?

Please provide a summary of the activities associated with the waste emplacement process. Will the emplaced wastes be compacted? If the intent is to compact, then packaging cannot be acceptable waste form.

If the liner is breached during emplacement activities, what are proposed mitigation measures?

14) Section 3.1.2 – Project Objectives (top of page 3-2)

“All waste to be disposed in the NSDF will be required to meet the Waste Acceptance Criteria (WAC) that will form part of CNL’s licence application. Though future waste (i.e. waste not yet generated) cannot be defined at the project outset, waste destined for disposal in the NSDF will be required to meet the WAC.

The NSDF will accept radiologically contaminated hazardous wastes (mixed waste). If required, mixed waste will be treated to comply with the WAC prior to its transfer to the NSDF.”

I suggest that the proponent must have some idea as to the wastes that are to be emplaced since they are listed in the second paragraph of this section (although no details are provided). Therefore, the proponent must have WAC in mind (whether or not it is documented) in order to determine the design of the facility. Please provide the WAC used to design this facility.

A clear problem definition that includes a description of the wastes to be emplaced will help to identify the appropriate solution. That description must include a summary of the types, acceptable characteristics (including radiological, non-radiological hazards content), size and packaging for the wastes. In other words, the problem statement must include the WAC.

The clear problem definition will allow for the identification of alternative means as required in CEEA (2012).

15) Section 3.3 - Physical Works Related to the Project (First paragraph)

This paragraph describes the designing of the facility. It should be noted that design is not a physical work.

Please revise.

16) Section 3.3 - Physical Works Related to the Project (first paragraph)

The sites listed as examples, “*Idaho CERCLA Disposal Facility, Fernald On Site Disposal Facility and the Oak Ridge Environmental Management Waste Management Facility*” are all licenced under US regulations. To demonstrate that these are appropriate examples to use for the design of NSDF, the proponent needs to provide suitable evidence that the US regulatory regime will meet Canadian legislation requirements. In this case, the minimum would be the CNSC Regulatory Guide, G-320 along with other applicable CNSC REGDOCs and guidelines.

In addition, a summary of the WACs for each of these facilities (including the Port Hope area sites) would help to establish whether or not these examples are appropriate when considering the NSDF design.

I note that the wastes emplaced in the Fernald site are from the “... *former Feed Materials Production Center, a uranium processing facility that produced high-purity uranium metal products...*”. Since no uranium processing occurred at the CRL site, this is not an appropriate example to use here. (See *Concerns with the NSDF Key Points as Provided by CNL* above.) Please remove this site as an example.

17) Section 3.5 - Project Activities (Post-closure and monitoring activities)

The proponent does not provide any information with respect to “*The assumed performance time frames of engineered barriers and the evolution of their safety function with time ...*” (CNSC G-320,

Section 7.4 *Assessment Time Frames*). Therefore it is not possible to evaluate whether the engineered barriers are adequate to meet the requirements of G-320.

The third bullet states, “*Monitoring and maintaining leachate collection and removal systems, leak detection systems, and gas collection systems to protect the surrounding environment and population from releases.*” Again no time frame is provided.

The proponent needs to acknowledge these issues in order to ensure that the design of the facility (and its infrastructure) will incorporate the appropriate features that address these concerns.

18) Section 4.1 - Project Location

As stated above (see Comment 3) Section 2.1 - Project’s Name, Nature and Proposed Location (Last paragraph on Page 2-2)), there is no information as to the site selection criteria, therefore the proponent has provided no basis on which to decide whether or not either site on the CRL property is appropriate for this undertaking.

For example, are the geology, hydrology, soil, bedrock, groundwater, and biota characteristics of the CRL site suitable for this type of facility? How do these CRL site characteristics compare with those for the sites cited as examples? Are the total foot print areas of the example sites similar to those for the CRL facility (estimated to be 30 ha)?

Apparently there are archeological issues associated with at least one of the sites. How were these archeological issues weighed against the other site selection criteria?

Since this area is subject to periodic earthquakes, what are the seismic issues associated with this proposed facility?

Since the impacts from the size of the facility alone (approximately 30 ha) will likely affect the whole local ecosystem, were ecosystem effects incorporated into the site selection criteria? (see also Comment 21) below)

19) Section 4.2 - Project Proximity to Residences

This section describes the current residences in the area. However, this proposed undertaking is a disposal facility which implies that the effects of the project will extend far into the future (possibly forever). As such, the proponent should provide a reasoned discussion of the implications to future residents in the area.

20) Section 4.3 Project - Proximity to Reserves, Traditional Territories and Land/Resources by Aboriginal Peoples (Third paragraph) and Section - 6.5.4 Effects on Aboriginal People

“Canadian Nuclear Laboratories is currently reviewing the Aboriginal groups to be engaged in dialogue about the NSDF project. This includes an assessment of the significance of potential adverse impacts and consideration such as asserted rights, historical or traditional practices and land claims.”

Engagement with aboriginal groups is a critical part of the requirements of the CEAA and is identified in Clause 5 (1) (c), of the Act (quoted below).

“... with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on

(i) health and socio-economic conditions,

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- (ii) *physical and cultural heritage,*
- (iii) *the current use of lands and resources for traditional purposes, or*
- (iv) *any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.”*

There appears to be a discrepancy between what the proponent intends to do with respect to aboriginal groups and what is in the Act. This is especially true since one of the selected sites, “*The EMR Site has high archaeological potential*” and the other “... warrants further study ...” (see Page 6-8).

Please revise to ensure that the aboriginal groups are truly engaged in the project decisions and not just informed (see Table 2-1)

21) Figure 6-2 Physical and Natural Features of the Two Candidate Sites for the NSDF

As stated in Section 4.1, the approximate areas for these sites is about 30 ha. This compares to the approximately 70 ha occupied by the built-up area (currently the campus). In and of itself, this area comparison should give the proponent pause to consider the potential impacts of this facility. They are unlikely to be minor.

Let us assume that only 90% of the 30 ha will be covered by impermeable engineered barriers. Thus the total area to be covered will be 27 ha. By any standards, this is a very large cover. And yet the proponent does not identify, as an environmental effect, the impact to the groundwater flows under these locations or to the run-off to areas outside these locations.

From the map given in Figure 6-2, both these sites appear to be in recharge areas for groundwater, and to be sources of run-off to the local wetlands, lakes and streams. The installation of impermeable liners and covers over these areas will prevent recharge of the groundwater. The water that would normally move through the subsurface will be diverted to surface run-off. As a result, the changes to the hydrology of these areas will be significant. The integrity of the neighbouring wetlands and streams, and by extension, any downstream fish and fish habitat will be severely impacted. Further the wildlife (turtles, amphibians, birds, etc.) currently residing in the wetlands and streams will also be impacted since the whole of local ecosystem will be adversely altered.

From this short evaluation, I suggest that the potential adverse impact to the environment would preclude the selection of either site. In fact, if one was to apply this simple analysis to the rest of the CRL site, the whole site would likely be disqualified as a potential location for the disposal facility. The site is too wet.

22) Section 6.5.1 - Fish, Fish Habitat and Aquatic Species (Last paragraph)

“Impact to fish or fish habitat ... and on aquatic species ... will be evaluated as the design of the facility proceeds.”

From the short evaluation given in the previous comment, the proponent should recognize that the anticipated impacts to fish and fish habitat maybe unacceptable. That said, any potential adverse impacts on the ecosystem must be included in the criteria for the site selection and cannot be left to the design phase.

Please revise to address Comment 21) above.

23) Section - 6.5.2 Migratory Birds

This paragraph is totally inadequate as it assumes the effects will only occur during the site preparation phase. Given the size of the proposed facility and its potential impact on groundwater and surface water flows, wetlands, lakes and streams (see Comment 21) above), any impact to migratory species will not be limited to their breeding season. The facility is likely to impact their complete life cycle.

Please revise and ensure a realistic evaluation of the potential impacts is provided.