

Date: December 8th 2017

From: Lisa Aitken

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

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

Subject line: Comments on EIS for In-Situ of Whiteshell WR-1 Reactor

CEAA Reference number: 80124

Comments:

Dear Candida Cianci & the Canadian Nuclear Commission

Please accept my attached submission:

Re: Comments on the Environment Impact Statement for the In Situ Decommissioning of the Whiteshell WR-1 Reactor

Please confirm receipt of my email and submission.

Thank you,
Lisa Aitken

December 8, 2017

Sent by Mail:

To: Candida Cianci
Environmental Assessment Specialist
Canadian Nuclear Safety Commission
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Ottawa, ON, K1P 5S9

Sent By Email: cnscc.ea-ee.ccsn@canada.ca

To the Canadian Nuclear Commission:

Re: Comments on the Environmental Impact Statement for the In-Situ Decommissioning of the Whiteshell WR-1 Reactor

We are registering our comments on the Canadian Nuclear laboratories (CNL) Environmental Impact Statement In-Situ Decommissioning of the WR-1 at the Whiteshell Laboratories Site.

1. In-Situ Decommissioning of the WR-1 Reactor, including:
 - a. Unsuitability of In-Situ Decommissioning
 - b. Longevity of Grout
 - c. Mitigation Issues
 - d. Radiological & Non-Radiological stressors on Human Health
 - e. Violation of Provincial Legislation
2. Public Participation & Stakeholder Consultation

Unsuitability of In-Situ Decommissioning

The in-situ decommissioning of the WR-1 Reactor is an unacceptable plan as it unloads the burden of the WR-1 Nuclear Reactor onto future generations and it knowingly places citizens and the environment at risk.

The initial promise to the residents was that when the site was to be decommissioned it was to be removed and the area returned to green space. The promise of total removal that was made to the citizens of Manitoba is now being broken.

In-situ decommissioning of reactors in North America is the least used method. When the CNL representative Brian Wilcox was pressed at the July 15, 2017 he confirmed this fact. The CNL website lists **3** sites in the United States that have been decommissioned in-situ. CNL has failed to share with the public that another 16 nuclear reactor sites in the United States have been dismantled. The World Nuclear Association reported on September 8, 2017 that worldwide 17 power reactors have been fully dismantled, over 50 are currently being dismantled and over 50 are in "Safstor" (a deferred dismantling plan), and **only 3 have been entombed!** In addition the World Nuclear Association stated that "proven techniques and equipment are available to dismantle nuclear facilities safely and these have now been well demonstrated in several parts of the world" (Decommissioning Nuclear Facilities, Sept. 8, 2017, <http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-wastes/decommissioning-nuclear-facilities.aspx>).

If in-situ decommissioning, entombment, is not the preferred reactor decommissioning option in the United States or in the rest of the World, why is it to be the preferred option for Manitoba?

The EIS states that the environmental assessment be in accordance with relevant standards and codes, while also taking into consideration appropriate guidelines (1.6.2, EIS, pg. 1-17), yet CNL's proposed in-situ plan is contrary to the General Safety Requirements of the International Atomic Energy Agency (IAEA). The IAEA clearly states that in-situ decommission/entombment is not an appropriate option for long life span radioactive nuclides (Decommissioning Strategies for Facilities Using Radioactive Material – Safety Report Series #50, 3.2.3.). The IAEA also stipulates that *“entombment, in which all or part of the facility is encased in a structurally long lived material, is not considered a decommissioning strategy and is not an option in the case of planned permanent shutdown”* (IAEA, GSR, Part 6, Decommissioning of Facilities, 1.10).

In-situ methodology is simply not the appropriate method of decommissioning as it leaves dangerous material entombed underground, making it impossible to access when failure and leaks occur.

Longevity of Grout

The in-situ decommissioning of the WR-1 Reactor would be the first in Canada, using an untested, newly developed grout that CNL, through “modelling” procedures has determined will begin to deteriorate in 300 years. Although the EIS states *“the grout will slowly degrade over time, allowing water movement to increase as it degrades, though this is expected to occur over thousands of years, and not all at once (3.5.4.1.2, pg. 3-37)”*, in a letter post marked November 27, 2017 addressed to Lisa Aitken, CNL Representative Mitch MacKay stated *“the grout will last much longer than 300 years, but it does begin normal breakdown around that length of time”*. The degradation of the grout beginning in about 300 years is an estimate and potentially could start earlier. It is unknown how the grout will withstand the Manitoba climate, the underground environment and the exposure to radionuclides, including the high-level radioactive materials of the WR-1.

When originally proposed the WR-1 in Pinawa was to be a scientific test facility looking at among other things the viability of storing radioactive material underground in the Canadian Shield at the Underground Research Laboratory. It was determined that the rock of the Canadian Shield was unsuitable for the long term storage of radioactive material. Why then is CNL proposing a solution that seals the reactor in a man-made substance that they admit only has a 300 year life span?

High-level Radionuclides Ni-59 and Ni-63 are listed among other radionuclides found in the Reactor Core. Although some radionuclides decay in decades, Ni-59 has a half-life of about 76,000 years. Both Ni-59 and Ni-63 will remain highly radioactive for tens of thousands of years. The radioactivity of the radionuclides of the WR-1 will long outlast the lifespan of the grout.

Whether the radionuclide decays in decades, hundreds or thousands of years, these radionuclides (listed pg. 6-306), including Ni-59 and Ni-63 *“are reasonably expected to be found in the grout and have the potential to migrate from groundwater to surface water during the post-closure (6.7.1.6.2.1, pg. 6-306).”*

CNL is aware that the grout is fallible and the risk to the environment and citizens is repeatedly documented in the EIS:

2.5.4.2, EIS, pg. 2-21, Environment

The in-situ *“decommissioning alternative represents the highest risk to the environment at the WL site during the post closure phase because the majority of radioactive materials will be present on site, unlike the other alternatives where the radioactive materials are either completely or partially removed. The primary effects pathway during post-closure relates to groundwater leaching through the WR-1 ISD structure which could migrate to surface water and then adversely affect human health and the ecological health of terrestrial and aquatic ecosystems.”*

6.7.1.6.2.1 EIS, pg. 6-305, Receptor Selection, Contaminants of Potential Concern

“Farm A is the highest likely exposure group, critical group for releases to the Winnipeg River because liquid releases from the Site travel downstream along the east bank. The main potential release mechanism during post-closure is via leakage through the WR-1 ISD structure to groundwater and subsequent migration of groundwater to surface water at the Winnipeg River.”

6.7.2.5.2.3, EIS pg. 6-328 Primary Pathways

“Closure activities will result in the atmosphere release of radiological and non-radiological compounds from the WR-1 Building. Release of solutes into the groundwater as the grout and reactor components gradually deteriorate over time may cause changes in groundwater quality which could migrate towards the Winnipeg River.”

Mitigation Measures

CNL fails to address in the EIS Section 10 of the *“CNSC’s Mitigation Measures of the Generic Guidelines for the Preparation of EIS”*. CNL does not provide a plan of action for long term monitoring that includes notification and emergency response measures to *“Farm A, Farm B, and Harvesters”*, local residents and the general public in the event of an accident, leak, unusual occurrence or hazardous event that has the potential to impact people and/or the environment, including the Winnipeg River, regardless of the intensity. Nor does it provide a detail monitoring plan.

The monitoring and follow-up that is provided in the EIS is ambiguous and at best limited to *“sampling and analysis of ambient air, surface water and ground water, including the Winnipeg River, sediment, vegetation, garden produce, game animals, and fish”* (6.7.2.9 Monitoring and Follow-up, pg. 6-343). In fact, the EIS states *“the size of the workforce after 2021 is anticipated to decrease to zero by 2024. A large workforce is not required during Institutional Control”* (3.5.5 pg. 3-38). How do you have a reliable, vigorous monitoring and reporting plan, that guarantee’s the public and the environment’s safety with no workforce?

CNL has failed to provide information regarding monitoring procedures when asked at the public sessions held in the local communities. Nor have they provided adequate answers when requested in writing by open-house participants. CNL states it has done conservative modelling and that the best case scenario is no more exposure to the general public than a dental x-ray (July 15, 2017 Open House, Lac du Bonnet), what they have failed to do when asked in public open-house forums is to articulate the worst case-scenario and their plan of action should this be the case. Is it not incumbent upon CNL as the proponent to predict worse case scenarios, inform the public of this risk, and have a detailed plan of action?

CNL in writing to the undersigned, stated that the “WR-1 is a small below ground early design research reactor that didn’t properly take into account future decommissioning”. A technology design based on the knowledge of the time (1960’s) which didn’t consider the potential for accidents and “unusual occurrences” that have plagued the WR-1 for the decades it was in commission. Has history not taught CNL or AECL anything? Is this plan no different than the AECL of the 1960’s, moving forward on an ill-conceived plan with little thought for future consequences: proposing in-situ decommissioning, rarely done worldwide, a grout just being developed which has never been tested, and as CNL purports will not outlast the radioactivity it is to contain.

An entombment of the WR-1 reactor is a short sighted, totally inadequate approach to decommissioning. By dismantling and removing WR-1 the materials can be stored and monitored until new technologies have evolved that will present a more permanent solution to disposal of radioactive material. The planned entombment is an irreversible step negating forever the application of future decommissioning technologies.

In-situ decommissioning may be the cheaper and quicker solution, but it is not the safest solution nor is it in line with accepted practice worldwide.

Violation of Provincial Legislation

CNL chooses to assume that provincial permits, licences or other authorizations are not required for this project (1.6.1, EIS, pg. 1-17). A project that violates Manitoba’s High Level Radioactive Waste Act which states no person shall:

- (d) *provide storage for high-level radioactive waste or spent nuclear fuel underground or in an above-surface environment that is not subject to continuous monitoring, as agreed between the government and the research facility, and that does not provide reasonable human access to the containers in which the waste or nuclear fuel is contained; or*
- (e) *provide facilities for the disposal of high-level radioactive wastes in Manitoba.*

Radionuclides with significant levels of radioactivity within the irradiated core are “high-level radioactive waste as per the definition of Manitoba Law. The in-situ of the WR-1 Reactor would be deemed a waste disposal site as the IAEA defines “*the end state of an entombed site equivalent to a waste disposal site*” (Safety Report Series #50, 3.3.3.), thus violating Provincial Legislation.

Manitoba’s High Level Radioactive Waste Act has been in effect since July 17, 1987 and is the result of the advocacy and demand of the citizens of Manitoba to have their voices heard to ensure the continued and future protection of the environment and of public health against the inherent risks associated with nuclear energy and the troubling experiences of the Whiteshell Nuclear Site and the Underground Research Lab. The voice of Manitoban’s has not changed and the Manitoba’s High Level Radioactive Waste Act represents that voice.

CNL has chosen to make assumptions and ignore Manitoba history of this matter.

Public Participation & 6. Public & Stakeholder Consultation

Pursuant to the Canadian Environmental Assessment Act, 2012, the CNSC “Generic Guidelines for the Preparation of an Environmental Impact Statement” it is incumbent on the proponent (CNL) to ensure “meaningful public participation”, “provide current information about the project to the public”, and provide in the EIS where consultation was held, the concerns voiced and to describe any outstanding issues and ways to address them.

The poster sessions September 2, 2016, December 1, 2016 and July 15, 2017 in Lac Du Bonnet, in which we the undersigned attended, no CNL representative made a formal presentation of facts and available options for decommissioning the WH1 reactor, instead the public was invited to circulate between “posters” CNL had developed for the sessions. The actual quantifiable information on these posters was scant at best, providing participants no information on the available options for decommissioning, the inherent risks and the long term stability and monitoring of the project. At no time did a CNL representative take notes of questions or concerns, nor was there any effort to summarise participant feedback.

The Table 5.2.2-2 (EIS, pg. 5-7), Table 5.3.2-2: (EIS, pg. 5-9), Table 5.3.3-2 (EIS, pg. 5-13), Summaries of Issues from Open Houses, do not accurately reflect or include the questions and concerns expressed by the undersigned. How can CNL report on “Key Interests and Concerns” of the public when they did not register any questions, concerns or comments made? These tables reflect CNL’s interpretation and do not include the questions asked or concerns raised by attendees. There were attendees who verbally provided CNL feedback at the open houses as an alternative to completing and sending “Comment Cards”, their voices are not portrayed in the EIS.

CNL has not properly engaged nor informed the citizens of Manitoba of their intentions for In-situ decommissioning of the WR-1 Nuclear Reactor. As attendees to the poster sessions held in Lac du Bonnet, limited information was presented on poster boards, all of which focused on the proposed in-situ decommissioning plan. Although CNL indicated there were 3 options, no information was shared on options other than the in-situ decommissioning plan. When asked in person or in writing little to no information was provided by CNL on other options, they promoted their preferred option of in-situ decommissioning and deferred answers by stating information would be available when the EIS was released to the public. For the public to be adequately informed and provide feedback, all options should have had equal representation at the public poster sessions and questions answered.

CNL was repeatedly asked about potential hazards and exposure to the environment and the public, worst case scenarios, monitoring plans, emergency preparedness plans, and remediation plans should things go wrong. CNL skirted the issue and said a lot of nothing:

“The post closure monitoring program will effectively monitor the site conditions. If the concentration levels of any contaminants are above our conservative levels, action will be taken. Specific details on an action plan have not been developed. However, the first steps will be to confirm test results and increase the period of testing, and at more locations. There are many strategies available should any remediation be required (CNL Response to L. Aitken, Dec 1, 2016 Feedback Form)”.

“Once the decommissioning project is complete, Atomic Energy of Canada Limited (AECL) will be responsible for the long-term care, maintenance activities and environmental monitoring to ensure that the decommissioning approach performs to expectations and corrective measures are taken if necessary (Letter to L. Aitken from M. Mackay CNL, November 2017)”.

“To ensure ongoing safety, Post closure monitoring plans will be developed jointly between CNL and the Canadian Nuclear Safety Commission, following the Environmental Assessment, if the project is approved (Letter to L. Aitken from M. Mackay CNL, November 2017)”.

As previously stated, the public needs to be fully informed of all hazards and potential hazards during and post decommissioning, along with detailed monitoring, emergency preparedness and response plans at every stage of implementation. CNL has neglected its responsibility and has not provided this information to the public or in the EIS, which should be a mandatory requirement as their in-situ plan is inherent with radioactive hazards for the public and environment.

CNL has limited their open-house public engagement to the communities within a 50 Km radius of the WR-1 Nuclear Reactor, specifically in the five towns of Beausejour, Whitemouth, Pinawa, Lac Du Bonnet, and Powerview. The advertising of these “open-houses” were limited to an ad in the local paper “The Clipper” and on two occasions an advertising leaflet was distributed in resident mail boxes in the central post office located in the town of Lac du Bonnet (as there is no home delivery), which were not received by many residents, or arrived the day of the event. As you can appreciate, residents do not go the central post office on a daily basis to retrieve mail.

In addition, at the open-house sessions, in email and in follow-up written feedback response forms CNL has been asked to host public engagement sessions in Winnipeg in order to inform and receive feedback from the thousands of season residents in the areas of Beausejour, Whitemouth, Pinawa, Lac du Bonnet and Powerview, and from citizens of Manitoba. The potential of in-situ decommissioning of the WR-1 is not a matter that will only impact the five communities listed above, but all citizens of Manitoba and for generations to come.

To date CNL has not hosted an open public information session in Winnipeg or outside the 5 communities within the 50 km radius of the WR-1 Nuclear Reactor.

The in-situ decommissioning of the WR-1 would be the first occurrence in Canada, a non-tested method in the harshness of a northern geological region, in which the majority of citizens of Manitoba are not aware, nor informed, which leads the undersigned of this letter with the perception that CNL is the sole decision maker.

We are not in support of CNL’s proposal for In-situ Decommissioning of the WR-1. We are four generations of farm land owners, located 6 km down river from the WR-1 Reactor.

Respectfully Submitted,

Lisa Aitken
Brad Biehn
Dolena Hess
Tannis Penner
Louise Ylonen