Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

CMD 22-H7.104B

File / dossier : 6.01.07
Date: 2023-05-06
e-Doc: 7065227

Final submission from the Canadian Environmental Law Association

Mémoire définitif de l'Association canadienne du droit de l'environnement

In the Matter of the

À l’égard des

Canadian Nuclear Laboratories (CNL)

Laboratoires Nucléaires Canadiens (LNC)

Application from the CNL to amend its Chalk River Laboratories site licence to authorize the construction of a near surface disposal facility

Demande des LNC visant à modifier le permis du site des Laboratoires de Chalk River pour autoriser la construction d’une installation de gestion des déchets près de la surface

Commission Public Hearing
Part 2

Audience publique de la Commission
Partie 2

May and June 2022

Mai et juin 2022

Canada

Canadian Environmental Law Association
EQUITY. JUSTICE. HEALTH.

May 25, 2023

Senior Tribunal Officer,
Commission Registry
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Sent by Email: interventions@cnsc-ccsn.gc.ca

Dear Sir or Madam:

Re: Final Submission by the Canadian Environmental Law Association to the Canadian Nuclear Safety Commission Regarding the Environmental Assessment for CNL's Proposed Near Surface Disposal Facility (Ref. 2022-H-07)

CELA writes to provide a final submission to the Panel of the Canadian Nuclear Safety Commission in relation to the decision it must make under section 7(b) of CEAA 2012 in relation to a proposal for a Near Surface Disposal Facility for radioactive waste.

We focus this final submission on the following issues, but reiterate all of the substantive submissions we provided in our original Submission and Request to Intervene. References in this final submission to the original CELA submission are to **CMD 22-H.104**.

Here in this final submission, CELA focuses on reviewing certain elements of its original submission, and draws the attention of the Panel to the hearing, where these concerns were reinforced by the testimony provided.

1. Section 7(b), 15(a) and 52(2) of CEAA

CELA submits that based on the totality of the information available to the Panel, the Panel must decide that the project is likely to cause significant adverse environmental effects. CELA further submits that the question of "whether those effects are justified in the circumstances" is one that must be referred to the Governor in Council under section 52(2) of CEAA 2012, which provides as follows:

> **Referral if significant adverse environmental effects**
>
> **(2)** If the decision maker decides that the designated project is likely to cause significant adverse environmental effects referred to in subsection 5(1) or (2), the decision maker must refer to the Governor in Council the matter of whether those effects are justified in the circumstances.

It is CELA's submission that several of the purposes set out in section 4 of CEAA 2012 have not been met, or only partially met in CNL's final EIS nor remedied by CNSC staff's assessment of "adverse environmental effects", nor were these deficiencies remedied by the information and testimony provided during the hearing or subsequently. This submission is reinforced, both by the Purposes of CEAA 2012, as well as the factors to be considered by the Panel, as described in the original CELA submission.

Section 24(4)(b) of the NSCA

CELA also submits that the proponent CNL has not demonstrated that it will "make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed" as required under section 24(4)(b) of the NSCA for the following reasons:

i) The lack of compliance with the prescribed information requirements for a license as required by Section 3 of the *General Nuclear Safety and Control Regulations;*
ii) The lack of compliance with the prescribed information requirements for a license as required by Section 3 of the *Class I Nuclear Facilities Regulations*[1]
iii) Inadequate alternative means analysis to capture the long term impacts of the proposal or its alternative means
iv) Inadequate planning for sustainability; particularly in respect of the lack of planning of retrievability of waste
v) Inadequate human health analysis
vi) Inappropriate environmental context for a radioactive waste facility
vii) Inclusion of waste that does not qualify for a low level waste facility – Cobalt-60, waste from disused tritium sources, legacy plutonium and uranium-133, and other radioactive isotopes

[1] Class I Regulations.

2. General Nuclear Safety and Control Regulations

CELA submits that CNL's licence application[2] does not satisfy all requirements under section 3 of the *General Nuclear Safety and Control Regulations* (the "General Regulations").[3] Section 3 of the General Regulations lists the information required to be provided in a licence application, including:

> […]
>
> **(j)** the name, quantity, form, origin and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including waste that may be stored, managed, processed or disposed of at the site of the activity to be licensed, and the proposed method for managing and disposing of that waste;[4]

As discussed in more detail in CELA's original submission, the licence application and final EIS lack key information required under section 3(1)(j) of the General Regulations, including the names, forms, and origins of many of the waste types that may result from the activity to be licenced.[5] For example, no information is contained in the CNL documents as to precisely what "packaged" waste contains. This lack of a detailed inventory means the CNSC cannot confidently determine whether the NSDF is likely to cause significant adverse environmental effects. This absence of essential information was not satisfied by the Proponent during the hearing; rather the proponent reinforced that waste will be classified in the future in an ongoing way, only if the approval is granted. **TR. May 30, 2022 p. 155. TR. May 30, 2022 p. 225. TR. May 30, 2022 p. 235.** The absence of the information required by the NSCA *Regulations* fails to meet the required precondition for an approval.

3. Class I Nuclear Facilities Regulations[6]

Section 3 of the *Class I Nuclear Facilities Regulations*[7] (the "Class I Regulations") contains a number of requirements for what information must be included in an application for a licence in respect of a Class I nuclear facility, in addition to the information required by section 3 of the General Regulations.

Section 3(e), for example, requires the inclusion of "the name, form, characteristics and quantity of any hazardous substances that may be on the site while the activity to be licensed is carried

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[2] Canadian Nuclear Laboratories, Updated Application for Licence Amendment to add the Near Surface Disposal Facility to the Chalk River Laboratories Licencing Basis (2021).
[3] General Regulations at s 3.
[4] General Regulations at s 3(1)(j).
[5] *Ibid.*
[6] Class I Regulations.
[7] Class I Regulations.

on".[8] As such, CELA reiterates that the required information should be included in the application and final EIS and without this mandatory information, the application is incomplete, insufficient, unacceptable, and lacks the necessary condition precedent for an approval.

For example, no information is contained in the CNL documents as to precisely what "packaged" waste contains. CELA submits this lack of a detailed inventory means the Panel cannot confidently determine whether the NSDF is likely to cause significant adverse environmental effects.

CNL's final EIS provides insufficient detail about how long-lived radionuclides will be dealt with in order to protect against significant adverse environmental effects. As discussed in more detail in CELA's original submission, the final EIS asserts that long-lived radionuclides cannot be separated from the waste streams at CRL and other CNL sites, but fails to explain or justify this assertion. Indeed, large amounts of long-lived radionuclides are included in the proposed NSDF inventory despite the fact that the NSDF is not designed to contain such a significant amount of long-lived radionuclides. CELA submits therefore, the CNSC cannot make an "environmental effects" determination without more information about why these long-lived radionuclides cannot be separated and how CNL intends to deal with them. This information was not provided during the hearing in any satisfactory way, and rather, as noted in the previous section, the proponent advised the Panel that CNL plans to inventory the waste in the future after an approval is granted, and that it will assess whether its waste at Chalk River is suitable for the proposed site during operations. This approach, where the waste is not adequately characterized, fails to describe "the problem to be solved", is a fundamental failure of the Environmental Assessment, and provides no basis for a conclusion by the Panel that in granting an approval, the purposes of the Act will be met.

4. Inadequate Alternative Means Analysis

As described further in CELA's original submission, CNL's evaluation criteria fail to capture the intergenerational and intra-generational justice concerns surrounding the distribution of economic, health and safety, and environmental costs, risks, and burdens of the project compared to the alternatives over its lifetime. In addition, each criterion is too narrowly defined to capture all relevant, context-specific issues surrounding the long-term impacts of the alternative means. This was not remedied during the hearing; rather the information provided to the Panel reiterated that the proponent failed to conduct a robust alternative means assessment and unduly limited the options it was willing to consider. **See CMD 22-H7-113B pages 24, 29**. Furthermore, the proponent did not consult the 18 municipalities in Pontiac until after both the site and the type of facility were selected by the proponent. **TR. May 31, 2022, p. 49**

[8] Class I Regulations at s 3(e).

5. Inadequate Provision for Sustainability – Lack of Planning for Retrievability of Waste

As CELA detailed in its original submission and its presentation, in order for its application to be approved, the proponent must demonstrate the project is sustainable. "Sustainability" is mandated by CEAA 2012, and this requires that the proponent demonstrate that it can meet the needs of the present generation, without compromising the ability of future generations to meet their own needs. However, the project has not satisfied this requirement to address inter-generational concerns. **TR May 30, 2022 p. 160**. This would mean in the case of the proposed NSDF, that the waste must be retrievable, for example in the event that the system does not perform as expected, or a future finding that some type of waste emplaced in the NSDF must not be left in place. This is particularly true given the long-lived nature of certain of the waste destined for the NSDF such as cobalt-60. The environmental assessment failed to address the range of accidents that could result if there is a need to retrieve this or other waste. In fact, the proponent admitted, at **TR May 30, 2022 page 135**, that it has no intention of retrieval of waste and therefore has not planned for it. The proponent stated that "it is not impossible" to retrieve the waste. However, this fails to meet the required standard of sustainability since this shows not only an insufficient level of planning for this eventuality, but no planning whatsoever for such an eventuality. **TR. May 31, 2022 p. 229** Thus there is no basis on which the Panel could conclude that the needs of future generations (such as for safety and protection of the environment) has been protected by the planned project. **TR. May 30, 2022 p. 296-297; TR. May 30, 2022 p. 358**

6. Inadequate Human Health Analysis

CELA submits that the doses and risks cited in CNL's final EIS are unreliable for use in decision-making, especially for the issuing of licenses and licence amendments. CELA submits that the human exposure estimates contain unacceptably large uncertainties. These estimates also fail to address recent studies that show greater radiation risks than currently acknowledged in the EIS.

Furthermore, as discussed in further detail in CELA's original submission, CNL estimates a high annual dose to workers of 10.4mSv. Therefore, if workers were to be employed for 20 years, their dose would be over 200 mSv—a very seriously high level that would significantly increase the risk of cancer, birth defects and cardiovascular disease. CELA submits this is contrary to the purposes of CEAA 2012 and the objects of the *Nuclear Safety Control Act*, which require the CNSC to exercise their powers in a manner that protects human health.[9] CELA submits that the Environmental Assessment, inclusive of evidence presented at the hearing, fails to provide any acceptable justification for the exposures to workers and the public that are predicted to occur at and from the facility.

[9] NSCA at s 24(4)(b).

7. Inappropriate environmental context for the proposed Near Surface Disposal Facility

The Panel was advised by the Proponent that the bedrock at the site is "highly fractured" to "depths of several tens of metres" and that this situation prevails across the CNL property, including the proposed NSDF site. The Proponent purported to submit that this is "advantageous" because, it said, the geology of the fractured bedrock "will behave as an effective porous media" and is therefore predictable." **TR. May 30, 2022, p. 234**. The representative of the provincial MECP subsequently stated, "you could capture [the leaking waste] at the property boundary and deal with it. **TR. May 30, 2022, p. 240**. That the site will leak radioactive effluent was confirmed by the proponent – it plans to release 140,000 bq/L at the point of release. **TR. May 30, 2022 p. 354**.

CELA submits that a highly fractured bedrock, to depths of tens of metres, is highly inappropriate for a project intended to hold radioactive waste for millennia. As the Panel heard from another Intervenor, this is not what the public expects or wants; the public wants to know that such waste is contained and isolated; not that the radioactive waste will "predictably" leak from the facility. **TR. May 30, 2022 pp. 254-255**. As yet another Intevenor noted, a facility that does not isolate the radioactive waste from the biosphere for elements like tritium and plutonium, cobalt-60, uranium-233 and others, is contrary to the International Atomic Energy Agency's international guidance SSR-5. **TR. May 31, 2022 p. 105**.

CELA submits that the Panel should find that the proposed Near Surface Disposal Facility will not isolate radioactive waste from the biosphere and accordingly, will cause adverse environmental effects.

8. Inclusion of Waste that does not qualify for a Low Level Waste Facility – Cobalt-60

CELA submits CNL's final EIS does not provide enough information about the form and origin of cobalt-60 in the NSDF waste inventory for the CNSC to determine that CNL will be able to protect human health. As discussed in further detail in CELA's original submission, large amounts of cobalt-60 are to be disposed of in the NSDF. While this large amount was not explained in the final EIS, it is surmised to be due to the planned disposal of disused cobalt irradiation devices currently being stored at Chalk River. In CELA's view, this large number of potentially dangerous cobalt-60 devices should be placed in much more robust containment than the proposed NSDF, as they have the potential to cause significant adverse human health effects. The Panel heard that 80% of the cobalt-60 in the reference inventory is from disused sources. The plan to dispose of disused cobalt-60 devices in the NSDF was affirmed by the Proponent during the hearing, in the

information presented to the Panel. **TR May 30, p. 137**. Placement of these types of devices in a low-level waste facility is not appropriate nor acceptable.

CELA submits that the Panel should find that the placement of disused cobalt-60 devices in a Near Surface Disposal Facility is inappropriate, and should not be allowed in such a facility. Other Intervenors made this same submission during the hearing. **TR. May 31, 2022, p. 118**.

9. Inclusion of Waste that does not qualify for a Low Level Waste Facility - Tritium, Plutonium isotopes, Thorium - 232 and Uranium-233

Furthermore, the Panel heard that the inventory also includes waste from dis-used tritium signs and lights, as well as plutonium and uranium-233 extracted from fuel in the 1940s and 50s for atomic weapons programs. **TR. May 30, 2022, p. 226**. Additionally, legacy waste at Chalk River facility includes mainly long-lived waste as a significant proportion of activity. If long-lived waste is not placed in an NSDF, then the proposal before the Panel is for a facility that will not even address most of the radioactive waste that constitutes the "problem" at Chalk River laboratories. **TR. May 31, 2022, p 139.** Accordingly, the proponent has failed to demonstrate a need for this project.

CELA submits that the Panel should find that the placement of crushed glass waste from disused tritium sources, as well as legacy plutonium and uranium-233 should all be precluded from placement in a Near Surface Disposal Facility.

In terms of tritium, CELA notes that the proponent cited the current provincial drinking water standard **TR. May 30, p. 77**, but did not confirm that the project would meet the province's drinking water standards in the event of a foreseeable tightening of that standard. For example, if the province of Ontario were to adopt the recommendations it has been provided by two previous advisory committees on tritium limits in drinking water; namely a recommendation for 20 bq/L (Advisory Committee on Environmental Standards / ACES) or in the case of Ontario Drinking Water Advisory Committee, (ODWAC), 20 bq/L annualized), then the drinking water standard would be 350 times more stringent than today's standard. Since this is such a foreseeable event, particularly given the time-frames in question, the proponent should demonstrate that the project could meet a much more stringent drinking water standard and without that demonstration, the Panel should find that adverse environmental effects are likely.

The Panel should further expressly find that heat-generating actinides, such as Actinium-227 and Plutonium-238, which may be found in legacy waste at Chalk River are not suitable for placement in a Near Surface Disposal Facility. This express finding should be made, regardless of representations by the proponent of its intentions for the facility, given that the waste has not been adequately characterized, and given that the proponent has shifted its plans as to the types of waste

to be emplaced throughout the environmental assessment process. **CELA Written Submission CMD 22-H.104 p. 34**.

10. Order Requested

For the foregoing reasons, CELA submits that:

a) The Panel should conclude that the Project as submitted is likely to cause adverse environmental effects.
b) The Panel should refer the question of whether the adverse environmental effects are justified in the circumstances to the Lieutenant Governor in Council.
c) The Panel should find that the Proponent will not make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed
d) The Panel should find that the application lacks essential information, which is mandatory before a licence may be issued as required by *General Nuclear Safety and Control Regulations* section 3, and that without this mandatory information, the application is incomplete, insufficient, unacceptable, and lacks the necessary condition precedent for an approval.
e) The Panel should find that the application lacks mandatory information required by *Class I Nuclear Facilities Regulations* before a licence may be issued as required by section 3 (e), and that without this mandatory information, the application is incomplete, insufficient, unacceptable, and lacks the necessary condition precedent for an approval.
f) The Panel should find that the Environmental Assessment provides an incomplete and inadequate justification for the project due to an inadequate alternative means assessment.
g) The Panel should find that there is no basis on which the it can conclude that the needs of future generations (such as for safety and protection of the environment) will be protected by the project; in particular because of the failure to satisfy the requirement of sustainability through the failure of the proponent to plan for retrievability of waste in case of accident, malfunction, or for other reasons in the future.
h) The Panel should find that the Environmental Assessment has provided an inadequate and incomplete assessment of human health effects and has failed to provide justification for increased exposures to workers and the public such that no finding can be made that there will be “no adverse effect.
i) CELA submits that the Panel should find that the proposed Near Surface Disposal Facility will not isolate radioactive waste from the biosphere and accordingly, will cause adverse environmental effects.
j) The Panel should find that cobalt-60 disused sources should not be disposed in a Near Surface Disposal Facility.

k) The Panel should find that the placement of the placement of crushed glass waste from disused tritium sources, as well as legacy plutonium and uranium-233, should all be precluded from placement in a Near Surface Disposal Facility.
l) The Panel should make an express finding that find that heat-generating actinides such as Actinium-227 and Plutonium-238, which may be found in legacy waste at Chalk River, are not suitable for placement in a Near Surface Disposal Facility.

All of which is submitted this 26 day of May, 2023

CANADIAN ENVIRONMENTAL LAW ASSOCIATION
Per

Theresa A. McClenaghan,
Executive Director and Counsel