

April 8, 2017

From: Pravin Shah

To: Nicole Frigault, Environmental Assessment Specialist
Canadian Nuclear Safety Commission

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

Re: Public Comment on Near Surface Disposal Facility Project – Canadian Nuclear Laboratories' Draft Environmental Impact Statement

CEAA Reference number: 80122

To: Nicole Frigault, CNSC

Public Comment on Near Surface Disposal Facility Project

As indicated before, please find my Comments on the Draft Environmental Impact Statement (EIS) document submitted to CNSC for approval by Golders Associates on behalf of the Canadian Nuclear Laboratories (CNL) - for the development of a Near Surface Disposal Facility (NSDF) .

I hope that the comments are useful and helpful in the evaluation.

April 08, 2017

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Near Surface Disposal Facility (NSDF) - proposed by CNL

My Comments on - Environmental Impact Statement (Report 232-509220-REPT-004 UNRESTRICTED) - Prepared by Golders Associates.

Dear Nicole,
Environmental Assessment Specialist
Canadian Nuclear Safety Commission
Ottawa

I would like to submit a few comments re: above Environmental Impact Statement (EIS) Report prepared by Golders Associates for the Chalk River Laboratories (CNL).

GENERAL

1.0) At the outset I would want to state that I am fully in favour, in principle, for the development of such a facility at the Canadian Nuclear Laboratories (CNL) site.

I understand that the NSDF Project will be designed as a permanent disposal facility.

As per the above report - there seems to be so much legacy wastes lying around and scattered at various locations at the CNL site - which do present a danger (both radiological and non-radiological) to habitat. Further, CNL site is old and most existing buildings /structures / site services are somewhat non-code compliant and tending towards being decrepit and building structures seem to be mostly of wooden construction and could be " tinder " and thus posing a definite fire hazard. Added to that many of these structures and services are somewhat contaminated by radioactivity - the site being a nuclear site operating nuclear research reactors and related facilities over many years.

As per CNL vision 2016 statement (see on-line LINK: <http://www.cnl.ca/en/home/news-and-publications/stories/2016/160414.aspx>) - the Site Revitalization is an important part of the CNL endeavours. The old site infrastructures as well as outdated site services (such as steam line, water lines , electrical systems etc.) require to be dismantled and removed and replaced with services and structures which are code compliant and safe.

The planned dismantling would then allow " managed " revival of the Chalk River site with progressively introduced modern nuclear and related research facilities at the site.

Without the removal of the old decrepit structures and services, the site cannot be transformed into a modern and thriving nuclear research laboratory . Now to facilitate removal all tens of buildings and services, it is necessary to have a place/facility where the removed junk can be disposed off.

I believe it would not be possible or permitted to dispose of such dismantled buildings and site services materials (containing varying degree of radioactivity) at the municipal garbage disposal (Landfill Site) facility on Baggs Road . Even if it is permitted , Baggs Road Landfill site has no capacity to accept such volume of waste.

Further , the dismantled wastes also cannot be carted away to any other site in Canada as such a site is non-existent.

2.0) I would imagine that without a credible/engineered waste disposal facility, the existing contaminated and decrepit structures and site services cannot really be dismantled as there will be no place for them to be carted away.

So logically , if there is no disposal facility which can accept such wastes - the existing structures and site services really cannot be dismantled and thus these old decrepit structures will remain in place and deteriorate over the years and then the fallen structures will contaminate the grounds and soil resulting in the contamination migrating towards Ottawa River and contaminating the river without any monitoring or control. Of course the Chalk River site will be abandoned at some time in its life as there will be not much renewal which can be brought in on the site. The local community loses.

3.0) The Chalk River Laboratory site is a licensed nuclear site in Canada and in operation for more than half a century.

The site has adequate space which can accommodate a new engineered waste disposal facility (of proper size) for low level radioactive contaminated wastes.

It is a given that the proposed disposal facility will be a professionally engineered and monitored site.

An appropriate quality check and verification by independent professional experts of the *concept and detail designs* of the proposed NSDF would provide credibility and comfort.

MY COMMENTS

1.0) CNSC oversight

While in principle I support the development of the NSDF proposed by the CNL at the Chalk River Laboratories site - *I believe that the devil is in the details* - and the above EPA report does not quite lend itself for knowing the details.

The report is full of motherhood broad-based conclusions and thus it becomes difficult for a private retired citizen to make any meaningful input - except to say that it behooves on the CNSC expertise to review the highly technical disparate issues highlighted in the report and also assure that appropriate " independent " professional experts have had been retained by CNL to confirm/verify the various findings , conclusions and designs.

I am sure that CNSC will assure the public that this has been done.

2.0) Site Selection

- I note that the report talks about two sites considered for assessment for locating the proposed Waste Disposal Facility:
 - East Mattawa Road - the proposed EMR site
 - the Alternate Site

The report is recommending the East Mattawa Road (EMR) for the proposed waste disposal site for the low level radioactive wastes.

- When looking at the site selection - I did not find any defined site selection criteria that was followed except it comes out loudly that the decision was based on road availability and accessibility. It needs to be emphasized that a proposed site must meet the defined site suitability criteria.
- When looking at various drawings/sketches attached with the above mentioned report , it does indicate that the selected EMR site is in close proximity of the Perch Lake (and the Perch Creek which facilitates the flow to the Ottawa River).

Table 2.5 -5 states -- *The EMR site is located in the Perch Lake basin, which has been impacted by plumes emanating from the WMA A and the Liquid Dispersal Areas (i.e., brownfield site) and as such, consolidates waste land uses.*

The Table 2.5-5 also states -- *The site is located immediately adjacent to the Perch Lake wetland, and therefore has an increased potential for indirect effects on terrestrial species that use this habitat*

One would wonder as to what are the advantages for locating the proposed NSDF near the Perch Lake, Perch Creek and also to the Perch Lake Wetland. If there are any known advantages - these need to be clearly enunciated within the Draft EIS Report.

Existing condition of Perch Lake is not quite clear from the report. I believe that the Perch Lake and its surrounding areas have been *under study* for decades (due possibly itself being contaminated from plumes emanating from WMA A).

Thus a lot of environmental studies of the area (earlier carried out) are possibly available and use of these existing/available studies reduces the need for further extensive time consuming studies and thus allow/facilitate faster decision as to the selection of a site for the proposed NSDF.

- The proposed EMR site is closer to Ottawa River compared to the Alternate site and thus any overflow from the proposed facility or from the proposed Treatment Plant will have a shorter route to the River (and aided by the existing channel - the Perch Creek) .

Is the flushing of Perch Lake (from inadvertent overflow of the proposed facility combined with heavy rain) possible? It may not matter but it is good to know - the consequence of any overflow.

- *One wonders why no alternative site on the western part of Mattawa Road was identified. The sketches/drawings (with report) show large area with lots of space - and devoid of any significant water body .*
- It is not clear whether any Safety Assessment codes or tools have been developed or used to verify the efficacy of the site selection

e.g. *see the example below :*

Probabilistic safety assessment model for near surface radioactive waste disposal facilities

By R.N. Nair, T.M. Krishnamoorthy in April 1998

Environmental Assessment Division, Bhabha Atomic Research Centre, Mumbai 400 085, India

A probabilistic safety assessment model had been developed for assessing the performance of near surface disposal facilities for low-level radioactive waste. Two modes of disposal such as single dump and multiple dump are considered in the model. The model is composed of four components: source term, repository failure, geosphere transport and radiological assessment.

LINK: http://metronu.ulb.ac.be/npaulu/art_2014_2015/nair_1999.pdf

3.0) ENGINEERING

- The proposed facility seems to be a deep hole (or multiple cells) in the ground and during heavy rain or after winter snow melt - the hole(s) would be filled with water like a bath-tub . How would this be dewatered and processed through the Treatment Plant before being released to the River . *Note : During construction as well as during operation stage.*

Please note that the Table 3.4.1-1 (*Equipment Required for the NSDF Project Site Preparation Activities*) does not list any dewatering equipment.

- Has a laboratory model on a shake table (of site topography with embedded model of the proposed facility) been considered? - to assess the impact to the site environment, to Perch Lake , Wetland and downstream pathways --- from the possible impact of design rainfalls in the area, of design seismic events and also the impact of the melt of mounds of snow cover over the facility (melt during or after the winter season).
- From the Report , I could not determine whether any Geotechnical Investigations of various proposed sites were carried out by Golders Associates - for location of a NSDF.

I understand that geotechnical investigations are required to obtain information on the physical properties of soil and rock around a site to design earthworks and foundations for proposed structures .

- Para 3.5.1 - Construction Materials states : -
It is estimated that 155,000 cubic meters of soil will be excavated for the initial design fill capacity of 525,000 cubic meters of waste.
The volume of excavated soil will be sufficient to meet the soil volume requirements for the daily/interim cover and for placement of the final cover.

The question is where and how this excavated material would be stored until it is utilized for daily/interim cover and for the placement of the final cover ?

- Figure 3.5.2 of the report shows a section of the proposed Primary and Secondary Liners. I note that the 0.75 m. of clay layer is sitting on the subgrade. I understand the subgrade refers to the native material. Would the clay layer remain intact over the years or possibly migrate through the subgrade as there is no buffer geomembrane liner or other intervening material.
- I presume the Engineered Containment Mound (ECM) and the Wastewater Treatment Plant (WWTP) along with other structures at the site are designed to meet with Environment Conditions such as Tornadoes, Thunderstorms, very cold weather, heavy snow and design seismic events - all possibly defined in the project Design Criteria document(s).

- While Para 3.5.2.5 (Berms) states that " A Slope Stability Analysis was completed to provide the information needed to support the design of the base slopes, sidewalls, and side slopes of the ECM". The Slope Stability Analysis addresses the range of anticipated loading conditions, under both short term and long term scenarios, to confirm that the slope designs will satisfy minimum factor of safety requirements for stability. Size and shape of the berms and each of the elements and layers were determined using a seismic design basis.

I presume the Engineers would also have carried out the slope Stability analysis of the whole NSDF site as a composite ? The sliding and sloughing of the whole area (due to seismic or other conditions) into the water body nearby can have disastrous consequences. The possibility of occurrence of such a phenomena needs to be studied for and put to rest.

I am sure that CNSC would examine that such analysis have been carried out.

- While Golders Associates are a recognized Consultant firm - I am surprised to note that all the sketches/drawings included in the Environment Impact Report show signatures which are " typed initials (2 capital letters in the initials) " - which , in a way , hides the professionals who worked in designing and producing the sketch/drawing. Who would make sure that qualified people were engaged in this important and a complex Facility.

Does verification of credentials of the designers and expert need to be confirmed?

- The Draft EIS Report does not provide meaningful Design Criteria or Design Basis/philosophy for the design and details for proposed major structures such as the Engineered Containment Mound (ECM) and the Wastewater Treatment Plant (WWTP). How do the acceptability of such structures be quality verified?

4.0) OPERATION

- It seems that operation of the facility requires operators with knowledge of waste type, methodology of placement of the waste in the facility, radio-nuclide knowledge , machinery /equipment knowledge, weather pattern/ meteorology etc. Method and process of monitoring of *leachate* and treatment of such. Is there a training program for the operators ? How long would it take to train a qualified operator and/or his/her support staff ?
- The Environmental Impact Statement (EIS) report does not mention a need for a project dedicated test laboratory (both for the classification of wastes as well as for the quality of leachate). Would that be necessary? and established at the site .

5.0) CURIOSITY

- In the Environmental Impact Statement report - I have failed to find any mention about "half life of radioactive nuclides " - in the waste materials . (Either maximum or average value).

Note : As I understand - The half-life of a radioactive substance is a characteristic constant. It measures the time it takes for a given amount of the substance to become reduced by half as a consequence of decay, and therefore, the emission of radiation.

Would that half-life value not help to determine the time frame for the need for monitoring of the site ?

- As for monitoring of the site (and various facilities at the site) - it would be of interest to know the type , extent and the manner as to how the supposed monitoring will be carried out. Would Ottawa River be monitored to give peace to downstream communities?

CONCLUSION

There comes a time when bold visionary decisions are necessary or critical in one's life or in the community's life. Of course the decisions should be made with proper understanding and required study and scrutiny.

The development of the proposed NSDF is one of these.

However, I am rather concerned about the site chosen (as described in the Environmental Impact Statement Report) for the location of the proposed NSDF - it is too close to the Perch Lake and Perch Lake Wetland and also to the Ottawa River. This present a visual which does not quite lend itself for comfort and thus does not allow concurring with the findings of this Report.

Further there is no mention of any review by outside independent professional expert(s) either on the site selection or on the Engineered Containment Mound (ECM) and the Wastewater Treatment Plant (WWTP) - which would lend some credibility to the Report.

It is my plea that the CNSC would guide and help the development of an acceptable and safe waste disposal facility for the low level wastes at the CNL site for the future of the CNL and thereby for the community around the CNL - as CNL is a major employer in the area. With the development of a NSDF - the CNL will grow into a viable and safe research facility and thus will contribute to the well being of local communities, Canada and the world at large