Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

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Written Submission from Timothy Wilson

Mémoire de Timothy Wilson

In the matter of the

À l'égard de la

Mid-term update from BWXT Nuclear Energy Canada Inc. on licensed activities at its Toronto and Peterborough facilities

Mise à jour de mi-parcours sur les activités autorisées de BWXT Nuclear Energy Canada Inc. à ses installations de Toronto et de Peterborough

Commission Meeting

Réunion de la Commission

May 2026

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Canada

April 17, 2027

Dear CNSC -

Thank you for providing me with the opportunity to provide this written submission. I am not applying to intervene in person.

My name is Timothy Wilson. [redacted], in downtown Peterborough. I moved to Peterborough in the year 2000. Before that, I lived for twelve years in Seaton Village, Toronto, within a few kilometers of BWXT NEC's (then GE-Hitachi's) operation on Lansdowne Street. I have been self-employed for over two decades as a researcher and writer. Though I am not a scientist, much of my research and writing pertains to medical and scientific matters.

I am writing specifically to raise concerns with regard to the public health risk of BWXT NEC's operations in Peterborough, and the possible expansion to pelleting, as is now permitted under the expanded Class 1B Nuclear Fuel Facility Operating Licence (FFOL).

At present, BWXT NEC bundles nuclear fuel in Building 21, on the old General Electric (GE) site, 25 meters from an outdoor elementary school playground. The expansion to pelleting, if it were to occur under this license, would almost certainly also occur in Building 21. This is of concern given that, since the expansion of the license in 2020, natural uranium dioxide (UO_2) has become recognized by the World Health Organization's (WHO) International Agency for Research on Cancer (IARC) as a Group 1 carcinogen when it acts as an internally deposited alpha-particle-emitting radionuclide.

As both BWXT NEC and the CNSC know, any grains of toxic dust coming from the BWXT NEC factory are very small, and can be breathed deeply into the human lung, where radiation and heavy metal chemical toxicity can harm DNA, cells and sensitive tissues, particularly in the kidneys. They can also travel via olfactory passages, and into the brain, causing neurotoxicity. The scientific consensus that there is no safe dose of radiation, and that the effects of radiation are cumulative throughout a lifetime, indicates that children, whose cells are dividing rapidly, are at particular risk. For stochastic events resulting in cancer and genetic mutations, there is no threshold. All that is required is for a single alpha particle to pass through a cell.

The previous licence application offered no specifics on how the "ALARA" (As Low As Reasonably Achievable) principle would apply to the expansion of pelleting to Peterborough. At that time, (as now, in the example of Dr. Alexander "Sandy" McEwan), there was only one commissioner with any professional knowledge or expertise on human health: Dr. Sandor Demeter. Not surprisingly, Dr. Demeter, a radiologist, university professor, and expert on the public health aspects of ionizing radiation, was also the sole dissenting voice. At the time, Dr. Demeter wrote:

"Moving the pelleting operations, adding radiation doses and UO2 air and effluent emissions in a site which has an adjacent vulnerable population, is not acting in an abundance of precaution."

The BWXT NEC license failed – and continues to fail – the ALARA standard for the simple ethical reason that nowhere has anyone done studies on alpha radiation exposure to children via ingested or inhaled uranium dioxide particulate. Animal studies, however, have indicated that inhalation is significantly more dangerous that ingestion. Given that UO2 can become airborne, and is flammable, there is little room for error, revealing the folly of *deliberately* placing the heavy transport of uranium dioxide and fuel processing – and more specifically pelleting – within 25 meters of a children's playground.

The rate at which radioactivity diminishes from uranium dioxide is very slow, remaining essentially unchanged over thousands of years. Given that the effect is cumulative, and that uranium dioxide releases alpha particles, the risk of soil contamination in a nearby playground, and possible ingestion or inhalation by children, whose cells are dividing rapidly, is worrisome. Nonetheless, uranium dioxide is perceived by the industry to be relatively harmless because, although the alpha particles are energetic and high in ionizing properties, their weight and size mean they lose their energy over relatively short distances – even topical (dermal) exposure is low risk. But this is deceptive, because inhalation or ingestion are another matter altogether:

If somehow inhaled or ingested, alpha particles can cause highly focused ionization, releasing all their energy just across a few cells and causing severe damage at both cellular and genetic level. This makes alpha particles possibly the most dangerous form of radiation.[1]

Research has shown that, after exposure to ionizing radiation, young children are much more susceptible to radiation-induced cancers than adults.[2] As a result, the healthcare industry sets distinct exposure standards for medical imaging with regard to children when compared to adults. However, when it comes to possible inhalation or ingestion of alpha-emitting uranium dioxide, the CNSC has no guidelines regarding the appropriate proximity of an elementary school playground to a pelleting operation. The logical summation is obvious: if the CNSC is serious with regard to its commitment to ALARA, pelleting in Building 21 in Peterborough is untenable.

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[1] Donya M, Radford M, ElGuindy A, Firmin D, Yacoub MH. Radiation in medicine: Origins, risks and aspirations, *Global Cardiology Science and Practice* 2014:57 http://dx.doi.org/10.5339/gcsp.2014.57

[2] Kutanzi KR, Lumen A, Koturbash I, Miousse IR. Pediatric Exposures to Ionizing Radiation: Carcinogenic Considerations. *Int J Environ Res Public Health*. 2016 Oct 28;13(11):1057. doi: 10.3390/ijerph13111057. PMID: 27801855; PMCID: PMC5129267.

It is unlikely that any community, anywhere in Canada, would accept a company proposal for a greenfields site for fuel pelleting and bundling, inclusive of the use of beryllium, within 25 meters on an elementary school playground. However, decision-making criteria change when business considerations come into play. The only reason the licence expansion to include pelleting adjacent to a school playground was given any merit, was due to the legacy of GE-Hitachi. The CNSC was well aware that the larger GE property in Peterborough was so deeply contaminated it was – and remains – essentially worthless. Remediation, should it ever occur, is expected to take over a decade and to cost hundreds of millions of dollars. At present, GE is unwilling to assume full responsibility of its brownfields lands in Peterborough. However, BWXT NEC, which leases the property from GE, is in a financial position to make an ethical decision, and to build a greenfields site far removed from residences and schools to construct a facility in a more appropriate location (the Pickering nuclear site, with its pre-existing buffer zone, would be a reasonable option). Unfortunately, BWXT NEC has no plans to pursue a greenfields option, possibly due to the affordability of their lease on contaminated land, and the fact that they would prefer to defer their own remediation responsibilities.

To conclude, during this license review it is incumbent on the CNSC to acknowledge that the science has changed: the WHO's IARC now recognizes UO2 as a Group 1 carcinogen when it acts as an internally deposited alpha-particle-emitting radionuclide. Given the close proximity of BWXT NEC's factory to a public-school playground, as well as the company's substantial financial resources, the CNSC would do well to require BWXT NEC to explore and assess alternate site options, given the expiration of this license in 2030.

Sincerely,

Timothy Wilson