

Tritium Awareness Project (TAP)

Michael Binder, President,
Canadian Nuclear Safety Commission,
280 Slater Street, PO Box 1046 Station B,
Ottawa Ontario K1P 5S9

March 11 2009

Dear Mr. Binder:

Thank you for your letter of March 4, 2009, in response to mine of Feb. 16.

Your letter raises three main concerns:

The first has to do with the amount of radioactive tritium deliberately released into the Ottawa River by AECL with the permission of the CNSC.

The second has to do with the concept of a "safe" dose of radiation in general, and a "safe" concentration of tritium in drinking water in particular.

The third has to do with the practice of deliberately diluting and releasing tritium-contaminated water into the Ottawa River.

1. The amount of radioactive tritium deliberately released into the River.

You say that "there was no leak of radioactivity to the river" because "the water released within the NRU building was collected and contained" and then was sent to the Waste Treatment Centre, from which "subsequent releases of tritium to the river have been controlled and monitored."

However, since the Treatment Centre is unable to remove tritium from contaminated water, all of the radioactive tritium that was sent to the Treatment Centre did in fact end up in the Ottawa River. Instead of being "leaked" into the river, it was – as you say – "released" into the river in a manner which was "controlled and monitored". By "controlled" I presume you mean "diluted".

Many people would like to find out just how much radioactive tritium ended up in the Ottawa river – a question which I posed to you in my February letter without yet receiving an answer. The answer is that as a result of the December 5 heavy water leak at the NRU reactor more than 25 trillion becquerels of tritium ended up in the Ottawa River.

I believe the CNSC has a responsibility to communicate this kind of information in a forthright manner to the citizenry and to their elected representatives. This responsibility is enshrined in the Nuclear Safety and Control Act, which obligates the Canadian Nuclear Safety Commission to "disseminate objective scientific information" about the activities of the Commission and its licensees.

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2. The concept of a “safe” radiation dose and a “safe” concentration of tritium in drinking water.

You state in your letter, “At no time was the public or the environment at risk.” This is not objective scientific information; this is an opinion.

I believe the CNSC is obliged to provide the public with objective scientific information about the nature of the health risks that accompany exposure to ionizing radiation.

Much scientific evidence has existed for many decades on this subject. The overwhelming consensus is that there is no such thing as a “safe dose” of exposure to ionizing radiation – or, for that matter, to any other carcinogen. The US National Academy of Sciences (NAS) examined claims from the nuclear industry and its proponents that there might be a “safe threshold” of radiation exposure, and rejected those claims as having no scientific validity.

In a 2007 press release announcing the publication of the NAS BEIR-VII Report on the Biological Effects of Ionizing Radiation, we read:

WASHINGTON (June 2007) — A preponderance of scientific evidence shows that even low doses of ionizing radiation, such as gamma rays and X-rays, are likely to pose some risk of adverse health effects, says a new report from the National Academies' National Research Council.

The report's focus is low-dose, low-LET — "linear energy transfer" — ionizing radiation that is energetic enough to break biomolecular bonds. In living organisms, such radiation can cause DNA damage that eventually leads to cancers. However, more research is needed to determine whether low doses of radiation may also cause other health problems, such as heart disease and stroke, which are now seen with high doses of low-LET radiation.

The study committee defined low doses as those ranging from nearly zero to about 100 millisievert (mSv)

"The scientific research base shows that there is no threshold of exposure below which low levels of ionizing radiation can be demonstrated to be harmless or beneficial," said committee chair Richard R. Monson, associate dean for professional education and professor of epidemiology, Harvard School of Public Health, Boston.

The International Commission on Radiological Protection (ICRP) makes the same point in a publication that is featured on their current web site:

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Both low and high doses [of ionizing radiation] may cause *stochastic*, i.e. randomly occurring, effects (cancer and hereditary disorders)... The probabilistic nature of the stochastic effects makes it impossible to make a clear distinction between 'safe' and 'dangerous', a fact that causes problems in explaining the control of radiation risks. The major policy implication of a non-threshold relationship for stochastic effects is that some finite risk must be accepted at any level of protection. Zero risk is not an option.

*INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION:
HISTORY, POLICIES, PROCEDURES* <http://www.icrp.org/docs/Histpol.pdf>

The CNSC, in keeping with its mandate, should make these easy-to-understand explanations of radiation risks available on its web site for the education of Canadian citizens and policy makers, and desist from misleading Canadians to the contrary.

In particular, the CNSC should remove from its web site this statement:

Radiation doses of 100 mSv [millisieverts] and more have shown increases in cancer incidence but there is no evidence of health effects at doses below about 100 mSv.

Frequently Asked Questions : Tritium
http://www.cnsccsn.gc.ca/eng/readingroom/factsheets/tritium_studies_faq.cfm

The statement is scientifically incorrect and misleading. It suggests that a safe threshold of radiation exposure exists – a conclusion at odds with the widespread scientific consensus as found in many documents published by the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the US National Research Council (NRC), and the International Commission for Radiological Protection (ICRP).

3. The practice of diluting and releasing tritium-contaminated water into the Ottawa River.

The linear non-threshold relationship espoused by leading authorities in the field of radiation protection implies that the harmful stochastic effects from even a low dose of ionizing radiation is proportional to the number of people exposed. Even diluted tritium levels will result in additional risk to these exposed populations, including MPs in the House of Commons.

The Ottawa River serves as a source of drinking water for more than a million people. Water treatment facilities cannot remove the radioactive tritium from drinking water. In light of these indisputable facts, AECL's practice of diluting and releasing tritium-contaminated water into the Ottawa River must be seriously reassessed.

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Quoting again from the document *ICRP: History, Policies, Procedures*:

The major policy implication of a non-threshold relationship for stochastic effects is that some finite risk must be accepted at any level of protection. Zero risk is not an option.

This leads to the basic system of protection which has three components –

- (1) the justification of a practice, which implies doing more good than harm,
- (2) the optimisation of protection, which implies maximising the margin of good over harm, and
- (3) the use of dose limits, which implies an adequate standard of protection even for the most highly exposed individuals.

Over the years there has been confusion over the meaning of the Commission's *dose limits*. The Commission now regards these as being close to the point where the doses from the sources to which the dose limits apply result in a level of risk that, if continued, could legitimately be described as unacceptable for those sources in normal circumstances. Compliance with dose limits is then a necessary, but not a sufficient, condition for complying with the Commission's recommendations.

On behalf of the Tritium Awareness Project, I urge the CNSC to discontinue the practice of allowing AECL to dilute and release tritium-contaminated water into the Ottawa River. This practice is unjustified, as it does no good and only harms the population that drinks the water.

Regulatory limits must not be regarded as a license to pollute.

Please share this letter with your fellow Commissioners. I thank you in advance for your attention to these matters.

Yours very truly,

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For the Tritium Awareness Project

cc. Minister of Natural Resources
Mayors of Ottawa, Pembroke, and Petawawa