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To: Nuclear Fuel Waste Management Organisation
Re: Asking the Right Questions? The Future Management of Canada's Used Nuclear Fuel.

1. Introduction

Please find below our comments on your first discussion document. We have followed the NWMO process thus far with interest and diligence, and have formulated our response to this first discussion document with care. In this response we present our comments and concerns about the content of this first discussion document, about the NWMO's approach reported in the discussion document, and about the template of "Key Questions" proposed in the document.

To summarize, we are concerned with what we see as the privileging of technical and scientific perspectives over alternative perspectives, and what we note as a lack of criteria or method with which to assess the plurality of public "acceptability" (a concept used without definition throughout the document). We are also concerned with the unbalanced and incomplete presentation of information about the nuclear industry and the development of nuclear fuel waste management in Canada, and the place and treatment of "future energy scenarios" in the NWMO's analysis. Of primary concern to us are the NWMO's methods for public "engagement" and aboriginal "participation" within its analytical process. Briefly, we find that engagement strategies fall short of including interested and concerned communities and groups in favour of uninformed and unaware randomly chosen individuals, and treat the knowledge and experiences of First Nations communities in a patronizing and superficial manner.

Our response concludes with suggestions for the "key questions" presented in the discussion document. Overall we find that the discussion document presents information in an unbalanced, incomplete, and uncritical fashion. We are concerned that this document, itself a method of public education and engagement, may mislead uninformed people. The details of our review are outlined below.

2. Competing Forms of Knowledge

In the forward it states, "This is an issue that requires the best of science and technology. But to respond to the fears and insecurities of Canadians, the unknowns and the complexities, as well as the optimism and hope demands a broader framework for analysis" (4). This suggests that there is a dichotomy between technology versus complexity and people's insecurities, with science somehow immune to society's messiness. This view is also expressed on page 10 when it is suggested that the issues that matter to Canadians are somehow separate from the 'facts' that can be provided by the technical community. This is exactly the kind of dualism that has long been perpetuated by the technological community; science has the answers, while complexity, uncertainty, and emotion are part of the 'lay' community. This is not an idea that the NWMO

should be perpetuating. Science *itself* is riddled with uncertainty and unknowns, especially when long-term modelling and novel technology is involved. Further, philosophical and sociological studies have authoritatively established that scientists cannot abstract from their societal context; they also bring their personal feelings and biases into their work.

To further elaborate upon this dichotomy, there are two ways in particular in which scientific knowledge is hived off from social knowledge in this document. The first is in aligning social knowledge with peripheral and abstract, rather than concrete concerns. This is particularly evident in the above cited statement on page 4, pages 20, 49-50, and throughout the template of key questions on pages 51-57. The second split evident in the document is one which aligns social knowledge with the particular and partial perspectives of interested, emotional, and political lay people (fears, concerns, values, etc) and by contrast, aligns scientific knowledge with universal applicability and relevance (facts). Briefly, these two particular ways of separating science from society are problematic in that they ignore the normative principles, structures, and goals built into scientific investigation; assume that *only* social knowledge is embroiled in politics; and promote the ideal that science is neutral, apolitical, and is not the social product that it is. In the template of "Key Questions" (pages 51 through 57), science is on the one hand constantly associated with concrete considerations while social knowledge (when not treated as a topic) is overwhelmingly associated with abstract and peripheral aspects, "overarching aspects".

In response to these concerns, the cutting edge of research in the areas of risk, adaptation, precaution and uncertainty insist that the rigor, accuracy and validity of science and technology is augmented when it is scrutinized more thoroughly, by a wide range of participants. These ideas are even outlined in this discussion document under the auspices of the precautionary principle. The NWMO should take care not to perpetuate the dualism between society and science, but should instead strive to decrease the uncertainty and increase the accuracy associated with any decisions by not placing science in some elevated poll position, but instead equally valuing the views of all interested constituents.

3. "Acceptability"

The word "acceptable" is used dozens of times throughout this document – e.g. *acceptable* levels of risk to the environment, *acceptable* stress, *acceptable* risk to people. Yet this value-laden term is never clearly defined or discussed. Acceptability is dependent on a number of factors including the extent to which a risk is imposed or voluntary and the assessment of costs versus benefits within different world views. It is not at all clear how the NWMO defines acceptability or hopes to achieve it among all Canadians among such a wide range of issues and situations. Where there is dissention regarding what is or is not acceptable, how will this be addressed?

4. The Nuclear Industry

There are several cases in the document, notably under the sections "The Context" (14-15), "What is Used Fuel?" (25) and "Why is Nuclear Fuel Hazardous (28-29) where important information is left out. To our reading, the omission of these details paints a picture of the nuclear industry that is unbalanced and favours the industry. For example, in a section called

"The Context" (15) the concerns of the Dene regarding the bombing of Hiroshima are outlined. However, it is never mentioned that uranium mining facilities and nuclear power plants were traditionally developed on First Nations territory (protected by treaties and affirmed and upheld in the Constitution act of 1982) without any consultation, approval, or compensation from communities such as Golden Lake, Serpent River, and the Chippewas of Saugeen and Nawash on the Bruce Peninsula.

In another case, when discussing the Seaborn Panel Report (18), none of the controversy regarding the First Nation and NGO opposition to the repository or the concerns about the legislation that formed the NWMO is mentioned. Instead, the environmental assessment and legislative processes are presented as a neutral 'fait accompli.' The resultant bland, apolitical portrait is in no way representative of the real story and, for Canadians with little background in this area, this representation is patently misleading.

Similarly, when explaining nuclear energy and waste production, it states, "under normal circumstances, there is no direct discharge of contaminants to air, surface water or groundwater." This statement is simply not true. Tritium regulations allow a certain level of regular radionuclide release and power plants/research facilities do not always operate 'normally'. Where is the description of the allowable releases, the 'abnormal' circumstances and the potential dangers associated with accidents? Where is the discussion of the change of perspective towards nuclear power associated with Chernobyl and Three Mile Island? Finally, the document suggests that the "body can normally withstand the radioactivity we encounter in our daily lives"(29). While this is generally true, the pursuant discussion does not explain to whom or under what conditions bodies are more likely to be at risk – e.g. the growing baby, foetuses. Nor does it differentiate the level of risk associated with a person's stature, lifestyle (e.g. First Nation subsistence) or health status.

Generally, Chapter 2 is incomplete; perhaps painting a picture that is out of step with recent headlines concerning the state of the industry. There are problems with some of our power plants and there are problems with the management of our power plants. There have been accidents and there have been spills. It would also be "balanced" to discuss the level of research and development undertaken by the nuclear industry and the level of investment and public funding that have gone, and continue to go, to the nuclear option.

5. The "NWMO Approach" (pages 20-22)

A) In this section it states, "Regardless of the future role of nuclear energy, used fuel exists today, and there must be a solution for managing the fuel bundles for the long term." While this is certainly the case, it is noted that the NWMO skirts the thorny issue that many Canadians believe that a solution such as deep geological disposal, where the waste is 'out of sight – out of mind', will actually perpetuate the nuclear industry and slow the development of renewable energy alternatives.

B) Further to the above, and in the same paragraph, it is stated that "… where the NWMO feels that assumptions about future energy scenarios are critical to the assessment of alternatives, these will be reported". Throughout the EA hearings (Seaborn), the separation of nuclear fuel waste

production and its subsequent management was contentious. Many submissions to the Panel were strident in advancing the argument that Canada's energy strategy should be a major consideration. As noted on page 12 ("The NWMO Mandate") the NWMO's focus is on nuclear fuel waste, not alternative energy scenarios. However, in this section, it is stated that at the NWMO's discretion, future energy scenarios can be considered. We believe that if future energy scenarios are to be considered (which we argue *should* be the case), the basis for their inclusion should not be the sole prerogative of the NWMO.

C) We have concerns about the outlined management approach. We note that the approach encompasses 'an *independent* review mechanism' – we suggest that this mechanism should also be transparent, open and inclusive, if the NWMO wishes 'to earn Canadian's trust and confidence'. In this section it also states that the 'principles of site selection' form part of the approach. We agree that is important, but caution the NWMO regarding the complexity and volatility of this component and that no known approach will be a 'magic bullet' for avoiding the conflict that generally surrounds site selection.

D) It is suggested that the NWMO approach will encompass a wide range of 'communities of interest'. Although this is a positive step, these various communities do not participate on an equal footing. For example, those from higher levels of government, the nuclear industry and other select groups tend to have more money, access to knowledge, power, and other resources to adequately understand the nuclear waste issue and to participate in the decision-making process. This leaves other communities of interest, such as the young and perhaps some place-bound communities and First Nation groups, at a comparative disadvantage. Environmental NGOs are also in a tight position, since they often have the knowledge and the desire to participate, but usually operate under severe personnel and budget constraints. Given these situations, we feel that this three year process of consultation and decision-making would be more equitable if some level of intervenor funding was provided to interested participants with demonstrated need.

6. Consultations

The NWMO devotes part of this discussion document to describing the types of consultation, reviews and so on that it has undertaken in the past year. While this is laudable, this discussion process has not been open and transparent. Most of these various activities have been organised by NWMO with selected groups of stakeholders, outside the public domain. While there is a forum for the general public over the next few weeks to discuss the current document, there has yet to be an open opportunity for interested and informed stakeholders to present their views. In fact, we have noted that the NWMO's "public engagement" techniques (for example, opinion polls, conversations about expectations, and current focus groups held by the CPRN) favour methodologies which select for individuals who are uninformed about NFW management, and the history of the policy process, while seeming to avoid those informed and active groups who have participated and been aware of the process all along. We had hoped that some kind of an inclusive session would be held to allow interactive discussion among stakeholders about the NWMO's current approaches. This level of transparency is necessary if the NWMO wishes to be seen as accountable and legitimate. This is the only way to gain the trust of Canadians. As it stands now, it is not clear how NWMO will use, process and respond to the various comments

they receive. There also does not appear to be a mechanism available for stakeholders to review the range of comments made or to question how the NWMO utilises that information.

Similarly, we are concerned with the current level of engagement of First Nations groups in the NWMO process. The workshop convened to solicit the views of elders and leaders from regions in Saskatchewan about the use of Traditional Aboriginal Knowledge was preliminary, selective, and ambiguous. To be sure this workshop did speak to the views of some First Nations groups present, however it did not necessarily speak to the views of those (many of whom participated extensively in the scoping and hearings held by the Seaborn Panel) who have extensive experience with parts of the nuclear fuel cycle. The knowledge of the many First Nations groups is extremely diverse and encompasses valuable expertise about nuclear waste, radiation, the behaviour of radiation in ecosystems, and alternative decision making processes. This is not reflected so far in the NWMO's approach to what it defines as Traditional Knowledge. Also, we have observed that the ways in which the NWMO chose to engage with the members of First Nations at the workshop (the format, process and level of engagement) did not challenge the plans of the NWMO in any way. Lastly, we are particularly concerned with the position, place, and timing of aboriginal consultation in the NWMO process. From what has been shown to be the case, the TEK workshop is a very preliminary step in understanding the use of TEK in the process, and the consultative process with the AFN has only just begun. The NWMO by contrast however is at a stage where it is already in the second phase of its three phase study with many important decisions completed. This raises questions as to what parts of the study First Nations groups are to be involved with; how they will be involved; and with what degree of significance? We strongly suggest following the lead of recent supreme court rulings and seriously considering the experiences and judgements of First Nations groups (especially those with experience with the nuclear fuel cycle) to be as important as the perspectives of the nuclear industry.

The contribution of First Nations to the NWMO process should not be cast solely in terms of traditional knowledge and values. It seems to us that this perspective is paternalistic. Perhaps more than any other group in Canada, First Nations have been affected by and have lived with the impacts of the nuclear industry. We have much to learn from them besides "the aboriginal sense of responsibility" or their "relationship with the natural environment".

7. The Analytical Framework

The NWMO poses a number of important questions that should be asked when developing the analytical framework. We would like to suggest a number of additions and/or changes.

- "Institutions and Governance"- it is not enough to have regulations and standards in place; the regulators must be seen as trustworthy and the rules must be viewed as rigorous and clearly enforced. Otherwise, even the best set of rules will not be seen as credible.

- "Aboriginal Values" - the last bullet refers to "conditions have been appropriately considered…" The meaning of this phrase is unclear and should be reworded.

- "Synthesis and Continuous Learning" – other considerations should also include: *who* will be responsible for monitoring and making course corrections.

- "Human Health, Safety, and Well-Being" - First, synergistic effects should be added to the list of effects to be considered. Second, there are wonderful sentiments expressed in this section, yet there has never been a case where a hazardous waste facility came remotely close to meeting this level of expectation. Facility siting is always disruptive for communities, it is impossible to determine a level of stress that would be 'acceptable' for everyone, these processes are generally not able to fully account for non-market attributes and *all* social costs and benefits can never be fully taken into account. We feel this section misleads by suggesting that issues surrounding health, safety and well-being can always be handled to the satisfaction of all concerned.

- "Security" – the key issues list seems narrow. What about biological disasters or other technological risks such as war? Further, security is more than reactive (e.g. response and recovery) – more than testing contingency plans. Security requires pro-active management (e.g. planning and mitigation) to identify and address human, environmental and technological vulnerabilities. We feel there is undue emphasis on passive safety at the expense of active safety.

- "Environmental Integrity" - First, it is hard to imagine that the imposition of a facility could 'improve' a natural ecosystem. Second, synergistic effects should also be assessed.

- "Technical Adequacy" – this section should not only include elements from adaptive management, it should also incorporate the key components of the precautionary approach. This means, for example, that broad stakeholder participation should be encouraged to more fully identify the potential costs and benefits and that known risks and uncertainties should be clearly identified in the technical reports (e.g. which modelling parameters are inherently uncertain over a 10,000 year time period?). Further, technical adequacy includes the ability to communicate this information in a manner that is understandable to a wide audience.

- An additional section called the Decision-Making Process, should be added since process-oriented questions appear to be lacking. Issues could include: stakeholder access to all pertinent information, provision of resources for disadvantaged group to enhance their capacity, identification of the approach that will be used to ascertain and balance the pluralistic values of Canadians including First Nations and marginalised groups and provisions for accountability, openness and transparency.

8. Concluding Comments

While we are not in a position to recommend or reject options for Nuclear Fuel Waste Management, we have concerns about the ways in which the methods for managing nuclear fuel waste are presented. First, we feel that the term "method", as defined on page 61, unnecessarily limits the discussion of management to technical methods. This is not to say that an actual technique for managing the waste is unnecessary, but that waste management in most other polluting industries requires strategies, practices, and ways of organizing production which limit the quantity and hazardousness of waste produced. We see no reason given the mandate of the NWMO that waste reduction practices not be assessed as possible complements to the methods

under consideration. For example, these practices could include the requirement to develop more efficient CANDU technology, a lowered reliance on nuclear energy sources, and/or the recommended phase out of the industry. This is not to argue that nuclear power should have no future in this country, rather to argue that production of waste and management of that waste should not be decoupled. The practices above suggest complimentary ways in which waste management can be improved to take into account all parts of the fuel cycle, without deviating from what we understand to be the mandate of the NWMO outlined in the Nuclear Fuel Waste Act. We believe that it is irresponsible, short sighted and against the public sentiment expresses in the panel hearings to consider management of nuclear waste without considering its source. As an example, Sweden, the country closest to implementing a Nuclear Waste Disposal method, arrived at this stage only after dealing with public opposition to the siting of a repository by holding a national referendum about the future of nuclear production in the country. Where the nuclear waste disposal debate had reached the point that in national elections nuclear production had become an election issue, after voting in a referendum to phase out nuclear power, the citizenry have supported the proposal of a deep geologic disposal facility, and the process to voluntarily site it. A similar lesson can be learned from Germany's experience.

Second, we are concerned with the presentation of the deep geologic disposal option on pages 62-64. We feel that the level of detail provided about this option is unbalanced and favours too closely the opinions presented in the AECL's 1994 Environmental Impact Statement about this option. Since the development of this concept it has undergone a rigorous public review. Of note are the numerous and competent conclusions of the Seaborn report and of the Scientific Review Group which advised them. Given the detail with which this option is described in the report (including the supportive statement on page 62 that "this method is currently supported by many countries and most international agencies") we feel that a balanced presentation of this method should include a reasonable discussion of the conclusions of the Seaborn report, as well as the findings of the Scientific Review Group. For example we find it misleading that there is no mention of the numerous major deficiencies found by the Scientific Review Group (SRG 1996) which in part referred to significant errors in the predictive modeling of pre and post closure repository behaviour. Similarly we find it misleading that the Panel's conclusion about the safety and acceptability of the Concept are not mentioned. It is important that the NWMO present a balanced review of the options under consideration, especially as this document is intended to educate new and uniformed readers. Similarly, we find it interesting that though the discussion of deep geologic disposal communicates international support for this option, the experiences of the countries closest to implementation of this option are not mentioned. For example, although the United States is very close to deep Geological disposal in Yucca mountain, its federal government is currently being sued in court by the State of Nevada over the decision to site the repository in Nevada. Similarly, while Sweden and Germany support deep geologic disposal they have both had to agree to phase out nuclear power to get the support needed for the concept. These three examples are not insignificant.

Thank you for the opportunity to formally respond to this first Discussion Document. Our response comes from our desire to see existing nuclear fuel waste managed in the most socially and environmentally just manner.