

Roundtable Discussion on Nuclear Waste Management

September 15-16, 2005

Munk Centre, Toronto

PROCEEDINGS, RESPONSE and RECOMMENDATIONS

1. Proceedings¹

Background

Since the early 1970s, the long-term management of high-level nuclear fuel waste has been the subject of often contentious societal debate in Canada. In the 1990's, a Federal Environmental Assessment panel, headed by former Deputy Minister Blair Seaborn reviewed a concept for long term management of Nuclear Fuel Waste (NFW) and identified strong public opposition. Societal debate continued as civil society responded to Natural Resources Canada's controversial 1996 Federal Policy Framework on Radioactive Waste; and the subsequent drafting of the Nuclear Fuel Waste Act. It is the Nuclear Fuel Waste Act that gives the Nuclear Waste Management Organization its mandate.

The current three-year study, being undertaken by the Nuclear Waste Management Organization, chaired by former director of the United Nations Environment Program, Elizabeth Dowdeswell, has now produced a draft recommendation to government for the long term management of NFW. The NWMO has requested public comments on this draft recommendation by the end of August 2005, their recommendation will be finalized and submitted to the federal government by November 15 of this year. If adopted by government the NWMO's recommendation will be implemented over the next 300 years with far reaching implications.

¹ *The following summary presents an overview of discussions but not a transcription of all ideas expressed. Given the timelines, the Roundtable preferred this type of summary presentation of its conclusions.*

Given the lengthy and persistent controversy which has historically surrounded this issue; the possible magnitude and import of its implications with respect to human health and safety and energy policy, and especially given the concern of many diverse civil society groups about the NWMO's study process, an independent Roundtable on Nuclear Waste Management was organized to consider the NWMO's work and draft recommendation. The Trudeau Foundation supported the Roundtable through the Trudeau Mentor, Elizabeth May. Sierra Club of Canada also sponsored the session.

Goals

The goals of the session included providing thoughtful and constructive response to the NWMO report, to exchange information and perspectives in an open and non-confrontational setting, and to increase awareness of the issues raised in the NWMO process. The Roundtable committed to produce a response to the NWMO report from the meeting. Ms. Dowdeswell, confirmed that the discussion and response of the Roundtable on Nuclear Waste Management would be considered outside the public comment deadline.

Summary

The participants represented a number of diverse viewpoints – faith perspectives, academic backgrounds, non-government organizations, and knowledgeable observers². The discussion particularly benefited from the presence of both Blair Seaborn and Elizabeth Dowdeswell. However, the group was not broadly representative in that it did not include industry representatives.

² Representatives from several Aboriginal associations were invited; due to various circumstances, no one was finally able to participate in person. For the agenda and complete list of invitees, see Appendix A.

The discussion focussed on three related issues. These issues include the technical, social, and ethical considerations raised in current discussions about the Nuclear Waste Management Organizations' draft 2005 Study Report: *Choosing a Way Forward* ³.

The Roundtable appreciated the deep and lasting import of the decisions around the process leading to the options outlined in the NWMO Study. Indeed, the issues raise matters that go to the very core of the human experience, requiring an exceptionally clear and respectful discourse ⁴

To begin each discussion the Roundtable heard a presentation on the technical, the social and the ethical aspects of nuclear waste management. Dr. Dougal McCreath (Laurentian University) presented criteria for evaluating the technical adequacy a NFW management option. Anna Stanley's (Guelph University) presentation began the discussion on social aspects with concerns about the "social acceptability" of the NWMO's recommendation, and the marginalization and exclusion of experiences and knowledge in (particularly those of First Nations) in the work and analysis of the NWMO. Professor Peter Timmerman (York University) opened the discussion on ethical aspects of the recommendation and the NWMO's work by analysing the ways in which different ethical principles were used by the NWMO.

The presentation on the **technical aspects** of the Study suggested that technical safety of an approach for the long term management of NFW be evaluated and judged based on the criteria of robustness and flexibility, and invited participants to reflect on the safety of the recommended approach according to these criteria. As well, the presentation invited reflection on the uncertainty surrounding NFW management raising the issues of societal and technical uncertainty, confidence in the performance of a repository over extremely long time frames, and on the nature and measurement of risk. The presentation also cautioned that full linkage to the nuclear fuel chain may defer important and needed

³ Nuclear Waste Management Organization, Draft Study Report: *Choosing a Way Forward: The Future Management of Canada's Used Nuclear Fuel*, 2005.

⁴ Please note that the NWMO web site (www.nwmo.ca) features a number of papers and comments submitted to the NWMO, including those produced by many of the Roundtables' participants and invitees.

action on the management of existing wastes, and cautioned that observational methodologies, monitoring, and continued evaluation were essential to safety.

The **discussion** that followed focused on the nature of uncertainty, how to handle inherent uncertainty, and how to appropriately balance “technical uncertainty” with “societal uncertainty.” Discussion also addressed the utility of the methodology of risk when making decisions over time frames where outcomes and probabilities of outcomes are uncertain at best and unknown or unknowable at worst. The recommended NWMO option was also discussed and critiqued from various perspectives according to these issues. Also important were questions of political accountability, the quality of the science that supports the recommended option, the definition of acceptable risk, the linkage of NFW management to energy choices, and corrective measures, mitigation and emergency response beyond “monitoring.” Lastly, the linkage of nuclear energy and nuclear waste management to action on climate change was raised.

The presentation on the **social aspects** of the study suggested that: (1) the study’s recommendation was not socially acceptable because it failed to meet the substantive concerns raised by civil society groups about NFW management, that (2) the experience and knowledge of Aboriginal peoples were dismissed, undervalued, and manipulated in the NWMO’s study and analysis, and that (3) Aboriginal peoples especially, but also other civil society groups have important experience of the nuclear fuel chain and its effects that are not, but should be included in the NWMO’s study ⁵. The presentation invited participants to reflect on the ways in which the NWMO’s study disconnects Aboriginal peoples, in particular, from any experience and knowledge of the nuclear fuel chain, and offered the metaphor of a landscape of the nuclear fuel chain created by the NWMO to illustrate this. Participants were also invited to reflect on the effects of the decoupling of the full fuel cycle from the management of waste, particularly its contribution to the “placelessness” of the debate, when real communities and a full

⁵ For example, there was wide dissatisfaction with the lack of attribution to and quotations of the public comments referred to in Chapter 3 of the Study’s Report on “What People told Us”. Compared to the Seaborn inquiry, this consultation seemed to lack a depth of analysis, consulted with fewer sectors and failed to provide a transcript and expand its mandate to encompass broader societal concerns, e.g. full fuel cycle/ energy policy more generally.

democratic/gender-related discourse are impacted by the general, unexamined, direction of Canadian energy policy.

The following **discussion** pointed out the observation that many Aboriginal peoples' submissions on the Study are now just coming in so that the draft NWMO report may already be in need of an update. Discussions focused on methods for Aboriginal and public participation, as well as the importance of the use of this knowledge and the way in which it is incorporated into the analysis and study of the options. It was observed that the study advocates a separate decision process about energy policy and nuclear production, but that it recommends that this be separated from the management of NFW, despite evidence that the study does consider the future production of nuclear fuel in various parts of its analysis⁶.

The presentation on **ethical aspects** invited participants to address the fundamental flaw of what was termed "Day 2 Ethics." The presentation suggested that the ethical principles and framework applied in the NWMO's study were ethical only insofar as they bracketed off more fundamental ethical issues and problems. The presentation pointed out that despite decades of recommendations that nuclear waste issues require broader ethical framing to be legitimately considered and resolved, the societal discussion continues to be pushed to "Day 2 ethics" where, as reflected in an analysis of the NWMO's study, ethical principles are uneasily fit into the NWMO's work.

The **discussion** raised various ethical principles that should be taken into account, and the consequences of these principles for the NWMO's work. Discussion also focused on the ways in which ethical principles had been incorporated into the NWMO's work and whether they were reflected in the recommendations.

⁶ See, for example, pages 106 and 290-292 where the study did selectively consider future production under economic feasibility and ability to accommodate increased waste capacity.

2. Response⁷

The response of the Roundtable to the work and recommendation of the NWMO was largely critical. Most of the participants at the Roundtable did not support the recommended option “Phased adaptive management.” This is due both to substantive concerns with the process that led to the recommendation, as well as concerns about the recommendation itself.

1. NFW management has for the entire history of nuclear waste management policy been separated from nuclear production and the management of the source of the waste.

A management approach and method of analysis that continues to be predicated on the decoupling of the production of waste from its responsible management cannot, in the opinion of the Roundtable, be considered “socially acceptable.”

Existing nuclear fuel waste is here to stay and, while being managed responsibly at the present time, provisions for its long-term management should be made without undue delay or excuse. The practical difficulties (including lack of political will and incentive at many levels) associated with the consideration of nuclear fuel waste management within the context of the nuclear fuel chain and bedevil resolution. Abstaining and recognizing that abstaining from a decision on energy policy may be interpreted as, or may actually constitute, tacit consent for the continued production of the waste into the indefinite future. The NWMO Report fails to note the historic reality that a public review through democratic institutions of the acceptability of nuclear energy has never been undertaken in Canada. The history of the issue cannot be divorced from the current debate. Many participants argue that it is not acceptable to proceed with a management plan without first seeking a social or political mandate to produce the waste in the first place.

A socially acceptable management option requires that consideration of the source of the waste (nuclear generation) be explicitly included in the management of the waste. At minimum, this would involve inclusion and consideration of the nuclear fuel chain, from

⁷ Ms. Dowdeswell did not participate in the discussions on response and recommendations.

cradle to grave, in the definition of the problem posed by nuclear fuel waste management, in the articulation of management options, and in the assessment of these options.

Ideally, and more broadly, this would suggest that:

(a) prior to proceeding with the management of nuclear waste, a review of energy policy with respect to the role of nuclear power generation at the federal level, be undertaken and that a clear and socially acceptable decision be taken about the continued generation of nuclear power;

(b) as a pre-requisite to considering future nuclear generation that governments with the support of power generation companies mandate robust demand side energy management programs and commit to replacing generation with alternative, green energy sources. The Roundtable also expressed concern that nuclear energy production, and the management of wastes, not be conflated with solutions to the mounting and important problem of global warming.

The NWMO's position is that its mandate under the Nuclear Fuel Waste Act does not allow for energy policy questions, such as the continued or expanded production of nuclear generated electricity. The Roundtable noted that in several places in the NWMO's analysis, assumptions are made about the total volume of NFW and/or the continued generation of nuclear fuel waste. In particular, the assessment team's analysis (one of two analytical processes undertaken by the NWMO to evaluate the relative merits of different options) assumes NFW generation continues only until the anticipated end of current reactor lives⁸. The Roundtable also noted that on other issues (for example consideration of economic regions) the NWMO has judged it appropriate to move outside of, or to creatively reinterpret, its mandate.

⁸ Although it is noted that this assumption is contradicted elsewhere in the report. See Appendix 12 of the report.

2. *It was widely acknowledged that the NWMO has conducted a wide ranging and innovative engagement programme to gauge public opinion and values related to this issue (though reservations were noted).* The Roundtable felt however, that the NWMO's use and treatment of the public and Aboriginal engagement material, particularly material from the Aboriginal people's engagement activities, was poor and that it did not constitute actual "participation" as reflected in the draft document. In particular, the Roundtable was concerned with:

(a) *The presentation of material ("opinions") from the engagement activities.* The material is presented (particularly in chapter 3 of the report) in a vague and condescending manner. Specifically: (i) the draft report repeats and summarizes the divergent views and opinions of civil society, without attempts to resolve them, transparently incorporate them into their analysis, or explanation how these views affect their study. In short, this material appears to go nowhere further than chapter 3, and it is difficult to see how the material is reflected in the objectives and principles that govern the NWMO's analytical work. (ii) The draft report, in summarizing and repeating the divergent views presents them as banal and mundane, as depoliticised feelings and matters of opinion. No attempt is made to examine the implications and importance of the deeply held political and experiential basis for many divergent claims about nuclear waste and its treatment. (iii) The draft report summarizes and repeats the views of divergent groups without attributing them. Presentation as "the some" and "the many" in the document do not do justice to the concerns and claims of various groups and their constituents. These three points indicate the extent to which the inclusion of public participation and comment appear not to have been actually included and used in the NWMO's work and study.

(b) *The misappropriation and misuse of Aboriginal knowledge and experiences in the study as presented in the document.* Specifically: the (i) misappropriation of specific Aboriginal teachings and what is often called traditional Aboriginal knowledge. On this particular point the Roundtable noted the repeated requests of several Aboriginal organizations to abstain from the use of Aboriginal teachings and knowledge unless applied appropriately to the question of NFW management and reviewed by recognized Aboriginal experts from the area of the teaching; (ii) the disconnection of Aboriginal

peoples claims and concerns from actual present and historical experience of the nuclear fuel chain; and (iii) the frequent amalgamation of Aboriginal experiences (including values and objectives) with “Canadian” (values and objectives). These three points indicate the extent to which material from the Aboriginal dialogues appears not to have been utilized in the NWMO's study. The Roundtable also noted that information from the Aboriginal engagement initiatives is still arriving and that the NWMO has not yet had the chance to fully engage with and incorporate this material into their study. The Roundtable also noted that despite this the NWMO has already tabled a draft recommendation.

3. The Roundtable noted the NWMO's choice to defer specification of economic regions (required by their mandate) and to abstain from assessing the options taking into account the economic regions for their implementation (also required by their mandate). The Roundtable also noted the absence of a clear, accountable, legally robust, and satisfactory explanation for this decision. Many of the participants felt this exclusion was problematic, for the following reasons:

- (a) by not fulfilling this requirement the NWMO is contravening its mandate;
- (b) not specifying an economic region delays the inclusion of representatives of the economic region including Aboriginal representatives from treaty areas in the region to the NWMO advisory council;
- (c) noting the history of public opposition to nuclear waste management, once places and communities are specified (for example the protests which lead to the separation of a waste management concept and location for implementation in the early 1980's) it is feared that the NWMO, by not specifying economic regions, may be artificially stalling place based critique, inclusion and opposition until a particular concept is approved;
- (d) not specifying an economic region continues to stall the inclusion of site specific ecological and sociological data with which to assess the different options.

4. The Roundtable felt the report would benefit from greater attention to issues of threats to human health and safety posed by nuclear energy and particularly by high-level nuclear fuel wastes. Particular concern was expressed regarding:

(a) the lack of clear and comprehensive information about the possible health effects following exposure to radioactive materials and other chemical substances found, over time, in the nuclear fuel wastes – including both internal and external exposure -- and the failure to include such information in their analyses;

(b) the lack of clear and comprehensive information about the health risks associated with radioactive exposures to especially vulnerable populations (women, fetuses, children, those with weakened immune systems, Aboriginal and subsistence communities, etc.) over different timelines;

(c) the lack of clear and comprehensive discussion of the controversies, uncertainties, debates, and divergent opinions amongst experts about the health effects of radioactive and other chemicals. (This was particularly noted as a problem for the reporting and presentation of material in appendix 2 of the report). The Roundtable also noted the need for arms length and multidisciplinary information about the health effects of radiation and other chemicals found in the wastes.

3. Recommendations

There was complete agreement that, as a prerequisite to proceeding with further discussions, society, in general, and governments, in particular, ought to mandate robust demand side management energy programs. Energy efficiency is universally regarded as an urgent priority for energy planning that is still receiving inadequate attention.

There was near complete agreement that the Study's recommended approach to nuclear waste management ought:

- There was near complete agreement that the study's recommended approach for the long-term management of existing nuclear fuel waste ought not to be used as an excuse for the continued or expanded production of additional nuclear fuel waste, and . ought not to be confused with strategic options for addressing the question of climate change;

- Not to just consider the management of nuclear waste, that the full fuel cycle must be part of the discussion, especially on the need to prevent the future production of nuclear waste by the use of energy conservation and alternatives⁹;
- Not to reduce the consideration about “acceptable risk” to the strongest/majority in society, but to give the most consideration to the weakest/minority in society, including future generations, who would actually bear the risks associated with the Study’s approach.

With respect to points of departure, there was some disagreement about:

- Whether or not a full review of the Study’s recommendations ought to: 1) be aired at the earlier abstract/conceptual stage, where no site specific location for the repository is identified, or 2) await a thorough environmental, social and economic¹⁰ impact assessment of a particular location or economic region;
- Whether or not it is scientifically possible and socially preferable for nuclear waste to be retrievable, for ease of access if technologies become available to “neutralize” it, or should it be made irretrievable, to avoid the reprocessing of it into plutonium and other weapons grade materials;
- How to reconcile different human approaches to “solving” the nuclear waste problem whether the focus should be on engineering/utilitarian/ non-judgement in the here and now, or whether the focus should be based on a holistic/integrated/ethical approach from Day 1, seems to depend on whether one has an optimistic or pessimistic view of human management and technological potential.

Despite these differences, the Roundtable was able to recommend the following to the NWMO and to Parliament:

⁹ For example, see Power to the Future Pembina, SCC Torrie Report, Rocky Mountain Institute, spring 2005.

¹⁰ It was observed that the Study was devoid of economic analysis to inform the debate.

A. To the NWMO:

1. The NWMO should clearly state and make specific and accessible reference in the body of its report (for the purposes of public understanding and education) to all places in its reasoning and rationale where assumptions have been made about the production of nuclear waste. The NWMO should also make clear and accessible in the body of its report, and in past and future analysis, the implications of future nuclear waste production for the management of nuclear waste to each option. This includes all dimensions of its analysis, such as the implications for continued transportation, the need to site additional repositories, the number of active nuclear sites etc.

2. The NWMO should, in the interest of “social acceptability”, include the production of nuclear fuel waste as part of the management of the waste. This inclusion may take several forms:

(a) The NWMO should formally request as part of its recommendation that the minister sufficiently extend the period of the NWMO’s study, or freeze or suspend the NWMO study, in order to accommodate an independent federal parliamentary review of the desired future role of nuclear power prior to taking a decision on nuclear waste management; **OR**

(b) The NWMO should request, as part of its recommendation, that the minister officially expand their mandate to specifically include (and require) consideration of waste production as part of waste management; **OR**

(c) The NWMO should re-interpret its mandate, as it has done for the economic regions requirement to specifically include (and require) consideration of waste production as part of waste management.

3. The NWMO should more adequately show and justify how it has used, applied, and considered material from public and Aboriginal engagement. Particularly the NWMO should:

(a) attribute the view and opinions of particular groups to those groups. In the case of Aboriginal peoples these should be attributed, as applicable, to the different

organizations, governments and communities which made them, rather than be attributed generically to the category “Aboriginal peoples”;

(b) the report should be written with a clear recognition of divergent views, acknowledgement of where they conflict, and their often deep and important basis in political beliefs and experiences. Justification for the preference and use of some views and opinions more than others should be provided. The vague and dismissive language of “the some” and “the many” should be dropped;

(c) the report should be written to clearly demonstrate and justify how the opinions, values, claims, dissent, and criticism of various groups of civil society have actually been incorporated into the NWMO’s analysis, and specifically into the formulation and definition of the analytical framework.

4 (a). The NWMO’s study and analysis must explicitly acknowledge the varying and multiple experiences of Aboriginal peoples in particular (but also of other groups in civil society) of the nuclear fuel chain. Most importantly it must acknowledge and demonstrably include the knowledge, insights and perspectives that come from these experiences.

4 (b) the NWMO should: not use the methodologies, teachings and the “traditional knowledge” of any Aboriginal people in a way that is inconsistent with their intended spirit as defined by the relevant Aboriginal nation or community; should use Aboriginal teachings, methodologies and “traditional knowledge” only if they will accept the actual implications of these for the issue and framing of NFW management; and should always review the use and application of teachings, methodologies and “traditional knowledge” with the relevant respective and representative Aboriginal knowledge practitioner.

5. The NWMO should, in the body of the report include a clear, comprehensive and widely accessible description of the hazard of nuclear fuel waste, focusing particularly on the health effects of nuclear fuel waste.

In particular this should include:

- (a) comprehensive presentation of the health effects caused by exposure to radioactive substances found in the nuclear fuel through time, including both internal and external exposure;
- (b) comprehensive presentation of the health effects caused by the chemically toxic substances found in nuclear fuel waste through time;
- (c) comprehensive presentation of the risks associated with different doses of and exposures to radioactivity to different populations (women, children, weak, Aboriginal and subsistence communities, etc.) over different timelines taking into account both the radioactive decay and the increased probability of dispersal with time;
- (d) comprehensive presentation of the disagreements, debates, controversies, uncertainties, and divergent opinions about the health effects of radiation and other nuclear materials, especially the health effects of long term very low level exposure to radioactivity.

B. To the Parliament of Canada:

1. The Parliament of Canada should immediately undertake a comprehensive public parliamentary review of the energy policy in Canada, including provincial, municipal and private authorities and civil society. Funding should be invested in the civil society sector to ensure fair representation. The specific focus should include:

- (a) the role of nuclear power generation in the context of the entire nuclear fuel chain (from the effects of uranium mining to waste);
- (b) the role of demand side management energy programs (including conservation and efficiency); and,
- (c) the role of alternative “green” energy sources in replacing nuclear, coal and large scale hydro generation.

1b. This should be undertaken, and a clear decision taken on the future management of nuclear fuel waste prior to proceeding with nuclear waste management.

Annexe A

TRUDEAU FOUNDATION & SIERRA CLUB OF CANADA

Roundtable Discussion on Nuclear Waste Management

September 15-16, 2005

Munk Centre, Toronto

Participants

1. Cenerelli, Bettina B., Trudeau Foundation
2. Dowdeswell, Elizabeth, former Trudeau Mentor, NWMO
3. Edwards, Gordon, Canadian Coalition for Nuclear Responsibility
4. Eindiguer, Debra, Sierra Club of Canada (organizer)
5. Elwell, Christine, Sierra Club of Canada (rapporteur)
6. Goldin-Rosenberg, Dorothy, Environmental Health, OISE, University of Toronto
7. Harley, Mary Lou, United Church of Canada
8. Kuhn, Richard, University of Guelph
9. Lloyd, Brennain, Northwatch
10. Martin, Dave, Greenpeace Canada
11. May, Elizabeth, Trudeau Mentor; Sierra Club of Canada
12. McCreath, Dougal R., Laurentian University
13. Murphy, Brenda, Wilfrid Laurier University
14. Neil, Maria, National Council of Women of Canada
15. Nimubona, Alain-Désiré, Trudeau Scholar, HEC Montréal
16. Seaborn, Blair, former Deputy Minister, Chair of the Seaborn Panel
17. Séguin, Michel, Community and Environmental Engagement Project C-Vert
18. Stanley, Anna, Trudeau Scholar, University of Guelph
19. Thériault, Sophie, Trudeau Scholar, Laval University
20. Timmerman, Peter, York University

TRUDEAU FOUNDATION & SIERRA CLUB OF CANADA

Roundtable on Nuclear Waste Management

September 15 and 16, 2005

Munk Centre, Toronto

September 15, 2005

6:00 pm Welcome and break the ice-dinner

September 16, 2005

Munk Centre for International Studies, 1 Devonshire Place, Toronto
Seminar Room 108 N

9:00am-10:30am Technical Aspects of Nuclear Waste Management
Introduction: Dougal R. McCreath, Laurentian University, School of Engineering*

10:30am-11:00am Coffee Break

11:00am-12:30pm Social Aspects of Nuclear Waste Management
Introduction: Anna Stanley, Guelph University, Trudeau Scholar

12:30pm-1:30pm Lunch (Munk Centre)

1:30pm-3:00pm Ethical Aspects of Nuclear Waste Management
Introduction: Peter Timmerman, York University

3:00pm-3:30pm Coffee Break

3:30pm-5:00pm Summary Session: Formulation of response to NWMO
Preliminary Report

**N.B. Every introductory presentation of 15-20 minutes will be followed by a plenary discussion.*