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Submissions from The United Church of Canada to the Nuclear Waste Management Organisation (NWMO)

Submission 1: United Church of Canada General Comments on Nuclear Wastes and the Work of NWMO (December 2004)

Submission 2: A United Church of Canada Ethical Lens and Commentary for Viewing the Problem of Nuclear Wastes (December 2004)

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Submission 1: United Church General Comments on Nuclear Wastes and the Work of NWMO

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Submission 1

United Church of Canada General Comments on Nuclear Wastes and the Work of the Nuclear Waste Management Organisation (NWMO)

(December 2004)

Contents

I. Summary of Recommendations

United Church of Canada policy related to nuclear wastes is founded on the ethical principles articulated in One Earth Community (UCC, 1992), Energy in the One Earth Community (UCC, 2000) and the Earth Charter (Earth Council, 2000) as included in the Appendix. Based on this policy framework, the United Church submits that Canada's approach to dealing with nuclear waste issues must:

1. reflect a responsibility to the Earth in its wholeness;
2. be founded on a just international order which is people-oriented, respects human rights, ensures the voice of the world's poor and is ecologically-sound;
3. promote change of lifestyle from high material consumption to greater equity and sustainability;
4. promote humanity's understanding of its collective responsibility for environmental damage and repair and that environmental damage must stop;
5. protect the rights of future generations;
6. not threaten the sustaining capacity of the Earth;
7. respect and protect the biodiversity of the Earth;
8. not contribute to militarization but promote a culture of tolerance, non-violence and peace;
9. ensure meaningful participation of individuals and groups in the decision-making processes;
10. assure opportunities for learning and access to knowledge;
11. be based on adequate environmental, social and cultural impact assessments;
12. hold authorities and corporations responsible for their actions domestically and internationally and ensure that Canada accepts its global responsibility to prevent environmental damage.

Such a framework, requires that nuclear fuel waste be viewed in an holistic manner:

as an issue within the complex of problems in the nuclear fuel cycle[1];

as an issue within the international problem of nuclear wastes, particularly in the context of Canada's export sales;

as an issue within the risks of proliferation of military applications for nuclear materials;

as an issue within the question of the future of nuclear power.

Guided by these ethical principles, the United Church of Canada highlights the following recommendations concerning nuclear waste policy in Canada which are discussed in detail in this submission.

1. The United Church recommends that the NWMO continue its research into enduring ethical principles that can help guide long-term thinking, and clearly present these ethical considerations throughout the assessments and in the final NWMO recommendation.

[1] The "nuclear fuel cycle" refers to the continuum from uranium mining through to the long-term hazards of radioactive wastes.

2. Concerning the future of nuclear power generation in Canada, in the context of the present nuclear waste management decision-making process, the United Church recommends:
    a. That the NWMO acknowledge in its final report that policies regarding the future of nuclear power in Canada and Canada's nuclear exports are key variables influencing the socially acceptability (as well as the practical feasibility) of any waste management approach;
    b. That the NWMO take into account that an assessment of social acceptability premised on a finite waste stream is not transferable to scenarios in which nuclear power continues indefinitely;
    c. That the NWMO specify in its recommendation that an ethically acceptable approach to managing existing stockpiles of nuclear waste would not ethically justify the production of new waste;
    d. That the NWMO report recommend the phase-out of nuclear power as a central component of any viable nuclear waste management approach;
    e. That Canadian energy policies be transformed to emphasize efficiency, conservation, safe, environmentally clean processes and renewable energy sources;
    f. That the federal government redirect its international trade promotion policies to favour energy development based on renewable sources used in a sustainable manner;
    g. That the NWMO process and outcome not be used to justify expanded or prolonged reliance on nuclear power or exports of nuclear technology;
    h. That the NWMO process and outcome not be used to limit public scrutiny of current proposals for "interim" on-site storage of nuclear fuel waste and related regulatory proceedings; and
    i. That the NWMO and Roundtable on Ethics broaden its criteria for an ethical evaluation of nuclear waste production to take into account the impacts of the whole nuclear fuel cycle.

3. In addition to the above, the United Church recommends that the NWMO address the following issues in its upcoming reports:
    a. The reports should disclose any contractual and ethical obligations for waste generated by Canadian nuclear technology in other countries and how this might impact a potential waste management approach;
    b. The assessment should evaluate the impacts that the use of enriched uranium fuel and MOX fuel[2] would have on each waste management approach;
    c. The reports should include up-to-date, well-referenced, balanced presentations of the facts, controversies, and uncertainties associated with the hazards of nuclear fuel waste and of the data, assumptions and limitations associated with the inputs to the assessments;

[2] MOX fuel refers to a mixed-oxide reactor fuel usually plutonium oxide and uranium oxide.

d. NWMO should seek out relevant research and identify gaps; all references should be cited in NWMO documents, citations should be in a standard academic format and these sources should be publicly accessible;
e. The recommendation should acknowledge that none of the management options under consideration are capable of "solving" the problem of nuclear waste's long-term hazards;
f. The recommendation should point out the need to support research on the hazard reduction of nuclear waste in a manner that does not add to the proliferation risk (i.e. focus on seeking a means to safely jog excess neutrons, alpha particle and beta particle from unstable nuclei in an absorbing environment when theses nuclei are in a nuclear fuel waste mix of radioactive nuclei of other isotopes and other elements);
g. The assessment should prioritize the need to ensure the waste can be monitored and remains retrievable for the purpose of ensuring containment and employing potential hazard reduction techniques; and
h. The recommendation should discuss the social and institutional requirements for ensuring ongoing transfer of knowledge, wisdom, and values to future generations for managing routine operations and coping with unanticipated events.

4. With respect to NWMO process, the United Church recommends that:
   a. The emphasis on participatory processes be continued and strengthened, including allocating funds to support capacity-building toward the meaningful participation of aboriginal communities;
   b. The importance of social acceptability be upheld as a fundamental decision-making criterion;
   c. The legislative framework include whistleblower protection; and
   d. If NWMO is to follow an "ethics of process", then all relevant issues must be brought to the table.

5. The United Church recommends structural changes to the Organization. In particular, the United Church suggests that the NWMO include in its final report the following recommendations:
   a. That the NWMO be subject to the Access to Information Act and be subject to investigation by the Auditor General; and
   b. That a new Board of directors be appointed that is more broadly representative of stakeholders.

6. With respect to the decision process, the United Church recommends:
   a. That the NWMO Board deliver the final report as prepared by the NWMO staff to the Minister of Natural Resources;
   b. That the NWMO recommendation be submitted to Health Canada and Environment Canada for formal review; and
   c. That the Minister of Natural Resources present the NWMO recommendation to Parliament for debate and vote, and that the NWMO include this proposal in its final report.

II. Introduction

The United Church of Canada (UCC) has had policy, educational and advocacy involvements over twenty-five years arising out of the Church's concern about issues related to nuclear power including high-level nuclear wastes. That history is presented briefly in Section III.

In the United Church's submission to the Canadian Environmental Assessment Panel (Seaborn Panel) reviewing the nuclear fuel waste management and disposal concept of Atomic Energy of Canada Ltd. (UCC, 1996), we identified some basic components of the world view that underline our engagement in such issues:

- *The world is a sacred space. In our tradition most of us theologize this by saying it was created by "God" and belongs to "God." Others of us, and many in the world, including Canada's Aboriginal people, say it is "God"/"Mother"/"Father." To still others it is a sacred space "only" in a secular human, metaphorical sense: it provides us with our life, and so is sacred. Under whatever auspices we think of it, though, we know that, uniquely in the universe, over a long time, Earth became able to generate and sustain the extraordinarily delicate balance needed for life like ours.*

- *Time in our world is a sacred time, in at least two senses. First, because many of the world's religions regard it so, among them those whose profound sense of "God" acting in time and history (not just in nature) gave birth, in the fullness of time, to our modern sense of "the historical" itself - the secular, and by now virtually worldwide, sense that happenedness is central to reality and meaning. Second - and probably even more important - time is sacred because, in whatever culture, narrative is a principal means of orientation, identity and meaning; such that the question of whether the world's narrative can be sustained over time raises, especially for self-conscious, historically constructed, Western persons, the threat of nihilism, non-being. Can we sustain the narrative not only to the third and fourth generation but to generations infinitely on in time - until cosmic events not precipitated by human agency bring this narrative to a close?*

- *The world is a sacred trust, in a more than metaphorical sense. In our tradition most of us theologize this by saying that we are to be "stewards" of it - passing it on uninjured in its life-giving capacities, and repaired where injury has occurred. Others of us, and probably the majority in the world, reject the perhaps proud and certainly separating language and thought of "stewardship," and think and speak, rather, of "ecological interdependence" or "participation" in the (for many) "holy" life of the world. In any case, to speak of the world as a "trust" is to speak of our responsibility for making space and time actually sacred, not just in metaphor but in history.* (UCC,1996, p.2-2)

The United Church approaches the present Nuclear Waste Management Organisation (NWMO) process in a spirit of hopeful cooperation, aware that there are aspects in the mandate, structure and process of NWMO which the United Church opposes [(UCC,

1999) and (Section V in this submission)]. The United Church has had a representative (Dr. Mary Lou Harley) at the initial NWMO Scenarios Workshops and at the National Dialogues which followed the release of Asking the Right Questions? (NWMO, 2003).

The United Church reflection on the work of NWMO and the material in the various NWMO documents and postings on the NWMO website is centered in the ethical principles presented in One Earth Community – Ethical Principles for Environment and Development (UCC, 1992) and the Earth Charter (Earth Council, 2000) – see Appendix in this submission.

Consistent with past reflections, aware of our limitations (Section IV), the United Church sees the nuclear waste issue as inseparable from some fundamental concerns, and submits that the NWMO should bring these concerns into the debate and into the report to the government regardless of whether or not they are strictly in the narrow mandate of the present task of the NWMO. These concerns constitute the body of Section V.

This submission is offered to NWMO and to the Church in the hope that they may contribute to substantive discussion of the complex ethical issues related to nuclear wastes.

The United Church submissions to the NWMO have been mandated and endorsed by the Justice, Peace and Creation Advisory Group of the Justice, Global and Ecumenical Relations Unit within the General Council of the United Church of Canada. There is a diversity of views in society and in the Church about these issues and we recognize that the perspectives reflected in this submission will not be shared by all United Church of Canada members. The submissions are based on current United Church policy (UCC, 1996; 2000) which identifies many concerns about nuclear power and the resulting wastes.

The principle writers of the current submission are Ms. Shirley Farlinger, Rev. Bob K. Fillier, Ms. Lisa Gue, Dr. David G. Hallman and Dr. Mary Lou Harley.

It is our intention to make additional submissions to NWMO for posting on its web site as NWMO prepares recommendations for the federal government due November 2005.

III. Brief History of United Church of Canada Policy related to Nuclear Wastes

The perspective of the United Church of Canada regarding nuclear power issues has evolved over the years. The early discussions in the United Church about nuclear power reflected an optimistic faith in this new technology. However, concern grew during the 1970s particularly in areas of significant uranium mining. From then on, the general perspective of the United Church has been one of concern about the safety and implications of the use of nuclear power.

The opening paragraph of a resolution adopted by the 28th General Council in 1980 sets the framework:

> *Whereas the United Church of Canada has a deep concern for the well-being of this and future generations and believes that science and technology should serve the quest for a just, participatory and sustainable society; and whereas an ability to solve many of the problems associated with uranium mining/nuclear power has not been demonstrated;* (UCC, 1980).

The resolution goes on to refer to questions about the link between nuclear reactor fuel and nuclear armaments, environmental costs and ethical issues associated with the nuclear fuel system, health impacts of radiation, and disposal of reactor and uranium mining wastes. The main thrust of the resolution is a call for a national public inquiry into all aspects of the nuclear fuel system and, in the meantime, the declaration of a moratorium on the expansion of existing nuclear facilities and/or the establishment of new nuclear facilities or mines.

The conceptual framework for United Church discussion about nuclear power was expanded in 1982 when the 29th General Council adopted a statement on Energy and the Church. Using the World Council of Churches' ethical framework of 'justice, participation and sustainability,' the report argued for the need for Canada to shift its energy policy from an emphasis on large-scale fossil fuel and nuclear energy generation projects to a focus on 'soft-path' energy options including conservation, increased energy efficiency and the development of renewable alternate energy sources. (UCC, 1982)

Nuclear power surfaced again in policy statements during the late 1980s on the issue of climate change. The 33rd General Council in 1990 adopted a resolution on Global Warming and Atmospheric Destruction, which affirmed:

> …*the appropriateness of responding to the global warming trend using soft path energy approaches which emphasize energy efficiency, renewable resources and energy conservation as the primary strategy for reducing fossil fuel emissions rather than expanding nuclear power production.*(UCC, 1990)

Since the safe, long-term management of high-level nuclear wastes from reactors was one of the concerns that the United Church has had over the years about the nuclear fuel cycle, the Church decided that it was important to participate in the environmental assessment process for AECL's disposal concept (Seaborn Panel). A major United

Church submission was presented to the Seaborn Panel in March 1996 using as its ethical framework the Church's General Council policy statement of 1992 One Earth Community – Ethical Principles for Environment and Development (UCC, 1992). Among the recommendations in the submission were the following:

- *the Concept of deep geological burial of high level nuclear waste should not be approved at present. Some of the points that lead to this proposal are:*
    - *the risks and uncertainties of the science related to the burial option;*
    - *the importance of retrievability of the wastes given the possibility that further research may demonstrate the viability of reducing its toxicity through such processes as transmutation;*
    - *the burden imposed on future generations if serious problems develop with burial as a result of unforeseen complications or inadequate technology;*
    - *decision for geologic burial at the present moment is premature and therefore irresponsible given the risks and the up to 100 year storage time still available in the present management system.*
- *effort and resources should be directed toward a safe, affordable, environmentally acceptable means to rapidly reduce the toxicity of the waste and the quantity of the waste;*
- *with respect to countries that already have CANDU reactors, AECL should provide all the technical assistance available to plan and implement a management strategy for the nuclear waste which would meet the highest standards for environmental acceptability and be applicable to the ethical, cultural, social, economic, environmental, technical and political situation of the client country;* (UCC, 1996)

The Church was deeply disappointed with the federal government's response to the Seaborn Panel recommendations and thus the Church made a submission to Natural Resources Canada in February 1999. (UCC, 1999) These concerns are discussed in more detail in Section V.

At the United Church's General Council meeting in 2000, a comprehensive energy policy statement was adopted entitled Energy in the One Earth Community and includes the following which serves as the policy base for our submissions to NWMO:

> *Energy policy in Canada should be based on ethical principles of respect for and justice within the One Earth Community, and should shift away from the strategy of expanding supply through energy mega-projects and focus more on managing demand and development of renewable, alternative sources. Specifically, Canada should:*
> (multiple recommendations related to various energy forms including the following)
>
> - *reduce our reliance on nuclear power, a technology which entails a level of risk many find unacceptable and for which there are still unresolved problems such as the safe disposal (or safe storage) of high level wastes of nuclear reactors;*
>   - *a moratorium should be instituted on the expansion of existing facilities and/or the establishment of new nuclear facilities or uranium mines, such moratorium to extend to the disruption of radioactive deposits and the export of nuclear technology and materials;*
>   - *in terms of nuclear waste management and disposal, the government should ensure that the full set of options for approaches to nuclear waste management are adequately explored in an open and transparent process with the necessary expertise in social and environmental science and in ethics. Any waste management agency that is set up should*

> *operate at arm's length from both the utilities and AECL, with a board and advisory council having broad representation.*(UCC, 2000).

IV. A Confessional Analysis of the Nuclear Waste Problem

The present nuclear waste conundrum is a problem that has no simple solution. Whatever the outcome of the current process, the decision taken could impact the health of our planet and all living creatures for many generations.

The problem is difficult.

We are in the habit of assuming that "problems" are always neatly coupled with complementary "solutions." But the problem of high-level nuclear waste is inconveniently exasperating and intractable. There is no easy way out, no magic wand that can be waved to make the problem go away. In this sense it is, to the best of our present knowledge, unsolvable. Not only is there no perfectly safe solution at the moment, there may never be. Although we cannot know in advance what future research and experience will reveal, they are certainly unable to illuminate our present dilemma.

We regret that much previous work has approached this problem solely as a technical puzzle; data alone cannot substitute for wisdom. We seek a more holistic approach.

The past is troubling.

Canada's nuclear waste problem has its origins in the 1940s and Canada's involvement with the Allied quest for the atomic bomb. When the Second World War was over and the Cold War had begun, the government redirected its nascent nuclear program, along with the considerable public investments that supported it, to harness the "peaceful atom" in service of electricity generation. This decision had strong symbolic and political appeal at a time when technology – especially nuclear technology – was largely accepted uncritically as a route to victory, progress, prosperity, and power. People were so anxious for a peaceful use of this awesome power that they readily supported this transition in a hope for healing the wounded spiritual self that felt such sorrow and fear at the destructive power unleashed in the horror of the atomic bombs. Succeeding federal governments went on to promote the prized CANDU reactor worldwide and subsidize the construction of nuclear power stations in three provinces, a decision welcomed by provincial electrical utilities.

Regrettably, there was little critical assessment of consequences when Canada first launched itself into the nuclear age. There was little or no public debate of matters such as the health and environmental dangers connected with mining and reactor operations, the threat of catastrophic accident or attack at a nuclear facility, the potential for CANDU technology to be used in nuclear weapons programs, the troubling legacy of radioactive waste, and the social and fiscal costs of managing these problems.

The last half-century has brought these problems to light, and they are awkwardly incompatible with the altruistic vision of "clean, peaceful, abundant" nuclear power that

we embraced in the 1950s. Yet as a society we resist coming to terms with this discrepancy. Our government continues to siphon public funds to the cause of nuclear power without ever inviting a public debate about the future of atomic energy in Canada. According to the Green Budget Coalition, the federal subsidy to Atomic Energy of Canada Ltd. in 2003/04 totalled $178 million. (Green Budget Coalition, 2004) Even as we now grapple with the problem of nuclear waste management, we are told that issues related to the continued generation of this waste are beyond the scope of the present exercise. However, it is the public that pays the price in energy rates, taxes, health and environmental damage. In this sense, we are all polluters and we all pay.

We particularly regret that it is Aboriginal peoples who pay the heaviest price in their contact with the nuclear industry.

As a society, Canadians have been similarly reluctant to examine the energy intensive lifestyles that feed our present dependence on nuclear power and other polluting energy sources. We have missed golden opportunities to embrace conservation, efficiency, and clean energy alternatives.

The future is uncertain.

The current nuclear waste problem has a long history, but a much longer future. Canadian law originally required the NWMO to consider a 10,000-year timeframe for the management approaches it evaluates. Though the specific numerical compliance limit has since been dropped, even this unimaginably long period is almost certainly inadequate. Indeed, some of the radioisotopes in this waste will need to be contained virtually forever. Projecting technical performance, social acceptability, governance capacity, impacts of the natural environment (e.g. earthquakes, glaciation, etc.), social stability and many other variables so far into the future involves troubling uncertainties. We are painfully aware of gaps in our knowledge and limits in our abilities.

We say this without intending to denigrate the scientific and technical research that underlies the three management proposals now before Canadians. Indeed, it is the rapid advance of scientific knowledge in recent decades that reminds us how trusted theories of one era are revised or replaced over time and how inherently *unpredictable* the frontiers of science often prove to be. Our most sophisticated models are fallible, subject to the limits of our imagination in even conceiving of variables that might be important in the future. This inescapable uncertainty frustrates our desire for definitive safety assurances.

Ethical analysis can contribute to more robust decision-making frameworks in the face of unavoidable uncertainty, but even in this area we are conscious of human limitations. We have so little experience in evaluating acceptability and accountability over long time-frames. Enamoured with technological progress, our society has not done enough to develop this capacity.

Compounding this problem, energy supply and management have long been the purview of centralized authorities. End users have been "unburdened" of any consciousness of the

infrastructure and mechanics of electricity generation, as they (we) plug in appliances, turn on light switches, and enjoy the "conveniences" of modern society. Consequently, the NWMO process is pioneering in an area in which we are insufficiently practised in democratic decision-making.

Despite our unknowing, we cannot responsibly ignore this problem. We must ensure, to the best of our abilities, that radioactive waste is isolated from the environment today and in the future, and if possible seek ways to reduce its toxicity.

Burdened with this problem, aware of its history, acknowledging our limitations, we approach the issue of nuclear wastes with humility.

V. Fundamental Concerns

Let us not be guided by corporate agenda, by political motives, by military urging,
by fear or by overconfidence.
Let us be guided by ethical considerations and social values arising from
the best efforts of respectful, participatory consultation
with the citizens and experts, and
by the best of social sciences, natural sciences and technologies,
with the wisdom to acknowledge the uncertainties and the limitations of our best.

Fundamental concerns about management of nuclear fuel waste arise from specific issues and inter-related aspects of trust, ethics, the framing of the problem, the whole nuclear fuel cycle, the future of nuclear power, social acceptability, containment, hazard reduction and safety. Headings are used to present the concerns, however, the content under the various headings is inter-related.

TRUST

The need for trust to be earned by any nuclear management agency has been documented in the Seaborn Panel report (Seaborn, 1998). There is an history which has lead to justifiable public distrust of the nuclear industry, the regulators and the government in relationship to nuclear power. The Nuclear Waste Management Organization arose out of that history with a structure and mandate that did nothing to help instill trust.

In stark contrast to the arms-length agency with broad representation recommended by the Seaborn Panel, only representatives from Ontario Power Generation, Hydro-Québec and New Brunswick Power form the Board of the NWMO. The crown corporation, Atomic Energy of Canada Ltd., is conspicuously absent The development of the *Nuclear Fuel Waste Act* followed from the Federal Policy Framework for Radioactive Waste of 1996, which was prompted in part by concern about the future federal liability for used nuclear fuel (Natural Resources Canada, 1995). The *Nuclear Fuel Waste Act*, through the establishment of the Nuclear Waste Management Organization seeks to minimize the risk of federal liability for spent nuclear fuel. However, the "polluter pay" principle has been applied in a way that gives the polluter control in the long-term management of the wastes. People whose jobs, reputation and even self-respect come from the nuclear industry are not in a position to make impartial decisions. "In Canadian nuclear waste management policy, there tends to be a priority of business values over values of justice. From an ethical perspective, this priority is difficult to defend." (Johnson, 2002)

In the Public Attitude Research Summary, Report on Discussion Group Findings, cynicism is described as "the public's default position …In the absence of any other experience to help them define the NWMO, many participants see the organization as something connected to both the government and nuclear power producers, neither of which inspires much confidence." (Navigator, 2003) The authors of this report for

NWMO seem unaware that NWMO is directed by nuclear power producers. The reality is that public concern about the industry connection is well-founded.

The staff of NWMO is attempting to operate as an arms-length company (NWMO, August 2004) but this is dependent on the efforts of the staff and the willingness of the Board. To support this effort, the United Church recommends that the NWMO Board deliver the final report as prepared by the NWMO staff to the federal government. The establishment of a board that has broad representation of the stake holders as outlined in the Seaborn Panel report would set NWMO within a structure better able to build trust.

The mandate for NWMO set by the *Nuclear Fuel Waste Act* allows only three years for the NWMO to assess at least three nuclear waste management approaches, (deep geological disposal in the Canadian Shield, storage at nuclear reactor sites, and centralized storage), and bring forward a recommended option, with financial penalties if the deadline is not met. The option of "permanent disposal, with no intention to retrieve, and ideally, no need for further institutional intervention" has been favoured by Natural Resources Canada (NRCan, 1995, p.2). Furthermore, disposal in the Canadian Shield is the only option that has received significant research attention in Canada over the last 20 years. Therefore, concerns have been raised that the NWMO assessment was set as a public relations exercise, with intention is move to disposal. The short time frame does not allow adequate study of the storage options or even evaluation of the environmental impacts of changes in the disposal concept, which does not help to build trust in the present NWMO assessment process.

The history warrants concern that actions taken on the nuclear waste issue will be used to promote nuclear power. The Federal Policy of 1996 was prompted in part by the need to "…make the nuclear option more acceptable as a source of energy, and reassure customers of the CANDU…" (NRCan, 1995, p.1). Also, the NRCan News Release 98/94 stated that "Taking steps to resolve the nuclear fuel waste issue would further support nuclear energy, and particularly the CANDU option, as a sustainable supply option for electricity." (NRCan, December 1998) These strong indications of the potential for any recommendation coming from NWMO to be used by the government and industry to promote nuclear power do not instill trust in the present NWMO process.

In this respect, it must be acknowledged that the NWMO process does not operate in isolation and its function is susceptible to misuse in other decision processes of direct relevance to nuclear waste management, that are simultaneously underway. For instance, since passage of the Nuclear Fuel Waste Act in 2002, the Canadian Nuclear Safety Commission (CNSC) has considered applications from all five of Canada's operating nuclear power stations to expand their "temporary" onsite nuclear fuel waste storage facilities. Four of these applications have already been approved (for Bruce, Point Lepreau, Pickering and Darlington) and the fifth (for Gentilly-2) is currently under review. These projects are intended to provide storage capacity for the additional waste that would be generated if the reactors are "refurbished" to extend their operating lives beyond the anticipated 30-year period. CNSC has restricted the timeframe under consideration in its environmental assessments of these projects, on the basis that the

issue of "long-term radioactive waste disposal facilities is not a matter for the environmental assessment. . . but rather for the Nuclear Waste Management Organization." (CNSC, 2004, p.6) The long-term implications of proposals to generate additional volumes of waste should be subject to greater scrutiny, not less. This is an abuse of the NWMO process to justify short-sightedness in related decision-making processes.

The *Nuclear Fuel Waste Act* establishes NWMO as not subject to the established means of public oversight, i.e. not subject to the Access to Information Act and not subject to investigation by the Auditor General. The United Church sees the efforts of NWMO staff to use a variety of expert and public engagement activities with the open paper trails on their website as an important step. The continued transparency is dependent on the present staff and cooperation of the Board. A public check system is dependent on the vigilance of the public and the willingness of the industry and government to share information with the public. Public consultation should be in addition to established means of public oversight, not in place of them. The NWMO would build trust by an action or recommendation to enable the Access to Information Act to apply to the NWMO thereby ensuring long-term transparency and a recommendation that the NWMO be subject to investigation by the Auditor General to ensure accountability.

The *Nuclear Fuel Waste Act* requires that the NWMO study be submitted to the Minister of Natural Resources Canada, and that the Governor in Council, on the recommendation of the Minister of Natural Resources Canada, shall select the approach for the management of nuclear fuel waste. The decision-making process by-passes Parliament and the Minister making the recommendation has a conflict of interest because the Minister of Natural Resources' portfolio includes promoting nuclear power through responsibility for Atomic Energy of Canada Ltd. (AECL). The United Church favours a process that would include a formal review of the NWMO report by Health Canada and Environment Canada and the presentation of the recommended management plan to Parliament for debate and vote. Any action or recommendation from NWMO that could help to bring the nuclear waste management options to Parliamentary debate would be a step to earn trust.

The time lines of activities and the structure of NWMO result in a situation that requires a level of trust on the part of the participants that their input is playing any real role in the assessment and recommendation process. Any trust that is given is fragile.

ETHICS

In the past, ethicists' input on the nuclear waste issue has not been valued in the way that the voices of technology and science have been. The concerns about the ethical framework to underpin assessments and decisions have been met with the comment 'but whose ethics?' In the world of very long-term consequences, of models and projections, of assumptions and risks, of limitations and uncertainties, it is fair to ask 'but whose science,' (Shrader-Frechette, 2003; Stirling, 2003) and to seek the enduring ethics that can inform long-term thinking.

The United Church is concerned that the ethical framework underpinning the NWMO study is inadequate. To contribute to the dialogue on ethics and the efforts to apply ethics in the long-term thinking, the United Church is presenting an approach based on an expressed worldview, a statement of ethical principles arising from that worldview and an application of those ethical principles as a framework for thinking upon the nuclear waste issue. This approach was demonstrated in the United Church submission to the Seaborn Panel (UCC, 1996).

The ethical principles expressed in the One Earth Community (UCC, 1992) were adopted by the United Church through a representative democratic process, and the Earth Charter (Earth Council, 2000) has been endorsed by individuals and groups around the globe. These two sets of ethical principles are demonstrated to be complimentary in the Appendix: United Church of Canada Ethical Lens, and further commentary on the Ethical Lens is presented in UCC Submission 2 to NWMO. Based on this policy framework, the United Church submits that Canada's approach to dealing with nuclear waste issues must:

1. reflect a responsibility to the Earth in its wholeness;
2. be founded on a just international order which is people-oriented, respects human rights, ensures the voice of the world's poor and is ecologically-sound;
3. promote change of lifestyle from high material consumption to greater equity and sustainability;
4. promote humanity's understanding of its collective responsibility for environmental damage and repair and that environmental damage must stop;
5. protect the rights of future generations;
6. not threaten the sustaining capacity of the Earth;
7. respect and protect the biodiversity of the Earth;
8. not contribute to militarization but promote a culture of tolerance, non-violence and peace;
9. ensure meaningful participation of individuals and groups in the decision-making processes;
10. assure opportunities for learning and access to knowledge;
11. be based on adequate environmental, social and cultural impact assessments;
12. hold authorities and corporations responsible for their actions domestically and internationally and ensure that Canada accepts its global responsibility to prevent environmental damage.

Together the One Earth Community and the Earth Charter are a significant representation of Canadian ethical principles, offered for consideration as a piece of the ethical framework, to be added to the values gleaned by engagements with citizens, the ethical principles, values and questions in the material from the Roundtable on Ethics, and Aboriginal perspectives.

The United Church is encouraged by preliminary reports on Traditional Knowledge on the NWMO website. The United Church is concerned that the remaining time in the NWMO study appears inadequate for the Aboriginal perspective to play an informative role in the decision-making. The United Church recommends that emphasis on

participatory processes be continued and strengthened, including allocation of funds to support capacity-building toward the meaningful participation of Aboriginal communities. The United Church (1996, 4-2) endorsed the statement in the Joint First Nations Submission to the Seaborn Panel that

> "*the concept of social, economic, environmental and ethical 'acceptability' should be considered from the point of view not only of 'Western/Judeo/Christian/modern scientific and technical' paradigms and world view, but from those of Aboriginal and First Nations perspectives*." (CEAA, 1995)

The rights of the poorest in society and of nature need to be given great consideration. In the question of avoidable radiation exposures to members of the public, the European Committee on Radiation Risk suggests that "rights-based philosophies such as Rawl's Theory of Justice or considerations based on the UN Declaration of Human Rights should be applied." (ECRR, 2003)

The NWMO appears to be taking an approach of 'ethics of process.' The United Church draws attention to the necessity in an 'ethics of process' approach that all relevant issues be brought to the table; this necessity has particular impact on bounding the issue.

NWMO has not brought forward a substantive framework of ethical principles but there has been the identification of values. (NWMO Roundtable on Ethics, 2004; CPRN, 2004) There is concern that the language has taken a commodity tone surrounding 'values', a trading and diminishing-value approach that could set priorities of business competing with ethics of justice. Also, different worldviews can affect the interpretation of values statements and how they influence thinking, assessments and decisions. Therefore statements of values need to be placed in the context of ethical principles and the application of the values in assessments and decisions needs to be made transparent.

A general concern that the United Church brings forward is that the NWMO approach to embedding the ethics (NWMO, 2003; 2004) has in fact hidden much of the ethical consideration. It is not transparent what principles have actually been applied and how they have informed the thinking in the evaluation of an issue, or in the language more commonly used in NWMO material, which values have been considered in approaching any given aspect of the issue and what trade-offs were seen as necessary.

The United Church acknowledges the efforts of NWMO staff to further the discussion on ethical principles, societal values, and Aboriginal perspectives. The United Church encourages NWMO to continue to look for the enduring ethical principles that can help to guide the very long-term thinking that nuclear waste demands and to make transparent the ethical considerations throughout the assessments and in the recommendation.

BOUNDING the ISSUE

NWMO is isolating the issue of nuclear fuel waste in a way that separates aspects from consideration that cannot be separated in reality. In the NWMO Background papers,

repeated cautions are given on framing the issue. In "Ethics of High Level Nuclear Fuel Waste Disposal in Canada," Peter Timmerman pointed out that the boundaries of concern have not been openly debated and indicated the extensive ramifications of the boundaries of concern (Timmerman, 2003). In "Risk and Uncertainty in Nuclear Waste Management," the importance of the frame used and its impact on the answer are discussed (Shrader-Frechette, 2003). In "The Precautionary Approach to Risk Appraisal," Andy Stirling speaks to the consequences of the artificial narrowing or the exclusion from consideration of aspects of an issue (Stirling, 2003).

The United Church highlights two aspects of the nuclear waste issue that cannot be excluded from consideration because the actions of the government have bound the outcome of the NWMO process to them:

- the future of exports of nuclear reactors
- the future of nuclear power in Canada

The Future of CANDU Exports: Canada's International Responsibility

The United Church finds it unethical that as Canadians struggle with the issue of nuclear waste management, our leaders are actively seeking to export the problem. Through AECL, a crown corporation, Canada markets its nuclear technology worldwide. Eleven CANDU units are operating in Argentina, China, India, Korea, Pakistan, and Romania, one more is under construction in Romania (AECL, 2002). AECL anticipates additional oversees orders within the next four years (AECL, 2004, p.8). In October 2003, just before the NWMO released its first discussion document, then Prime Minister Jean Chretien made headlines when he met with his Chinese counterpart and lobbied for Chinese investment in another CANDU unit (Panetta, 2003). The ethical considerations concerning the radioactive waste that Canadian reactors generate in other countries do not appear to have received much attention.

The NWMO process is conspicuously silent on the international dimension of Canada's nuclear waste problem. Yet, there is strong indication that a decision on a management approach will be promoted as a "solution" to the problems of nuclear waste, in the push to expand nuclear power.

AECL's Corporate Plan Summary 2004-2005 to 2008-2009 is revealing in this regard. In support of the company's objective to realize profits on the sale of CANDU reactors, AECL claims "growing public acceptance of nuclear energy" based, in part, on "open acknowledgement by the US government, in approving the Yucca Mountain repository, that there is a safe and practical solution to nuclear waste" (AECL, 2004).

Setting aside the misrepresentation of the management approach in the USA as "a safe and practical solution," this statement raises concerns about the integrity of the NWMO process and the underlying motives of key actors. Although the AECL Corporate Plan Summary does not explicitly discuss the NWMO process, the upcoming decision regarding nuclear waste management in Canada is the obvious analogue to the referenced US proceedings. AECL apparently believes that an available longer-term management

plan for the nuclear waste problem improves public acceptance of nuclear power, which in turn improves prospects for CANDU sales. Seen from this angle, the difficult search for a socially acceptable approach to nuclear waste management looks more like a marketing strategy in line with AECL's efforts to "influence acceptance [of nuclear power]" (AECL, 2004, p.4) than an honest collaborative process. This is particularly troubling given the Minister of Natural Resources' responsibilities for both acting on the NWMO recommendation and promoting nuclear power on behalf of AECL.

The United Church urges NWMO to discuss Canada's international responsibilities, recognizing that it is the intention of the government to use the outcome of the NWMO recommendation to support export of nuclear reactors. At the least, the United Church urges the NWMO to address any contractual and ethical obligations for waste generated by Canadian nuclear technology in other countries, and how this might impact on a potential waste management approach.

The United Church offers for consideration ethical principles in the Appendix that could help to frame a Canadian response and expresses the hope that Canada's trade promotion policies might shift to favour more sustainable, renewable energy development.

The Future of Nuclear Power in Canada

The United Church insists that the nuclear waste management issue is inseparable from the issue of the future of nuclear power. It is well recognized that it is necessary to have any long-term nuclear waste management option framed within known decisions on the future of nuclear power (NAS, 1994, p.222). The future of nuclear power has a direct impact on evaluating management options; it is not a side issue and it is more than a contextual issue.

All the discussion, conceptual designs, cost estimates and management option assessments presented by NWMO to date [(NWMO, 2003; 2004), (NWMO Assessment Team, June 2004)] have been based on the assumption of approximately 3.6 million spent nuclear fuel bundles, i.e. the existing waste plus that estimated to be produced by existing plants. To be ethically sound and logistically sensible, the implementation of any long-term management plan for nuclear fuel waste must be premised on a finite waste stream. Addressing the waste that presently exists is a necessary step and a management plan to safely contain the waste for a time beyond the projected life of the present storage system is essential. Addressing waste that will be produced during the expected serviceable-life of existing plants, (without re-tubing or refurbishment) may be a practical necessity, though there are arguments for an earlier phase-out, which the United Church has made (UCC, 2000). For NWMO to make a recommendation on a management option based on their work which assumes these limited nuclear fuel waste sources would require that NWMO explicitly recommend that Canada limit total nuclear fuel waste production to that estimated to be produced by existing plants, as defined in NWMO assessment document (NWMO, June 2004, p.34).

However, as already noted, our government and several utilities have indicated intentions to expand nuclear power and generate additional volumes of waste. The troubling potential that a nuclear waste management plan will be presented as long-term assurance, and used to promote nuclear energy, needs to be addressed in NWMO deliberations.

If it is not NWMO's intention to recommend that the production of nuclear fuel waste be limited to the estimated nuclear fuel waste from existing plants, then NWMO must include a full range of different future nuclear energy scenarios in assessments; to address only estimated nuclear fuel waste from existing plants would be misleading. Without a commitment to stop production, neither the quantity of nuclear fuel waste nor the time frame of production can be limited in the assessment and implementation considerations, and the impact of limitless waste from a range of possible future nuclear fuels must be assessed.

The inclusion of future scenarios with different nuclear fuels or expansion of capacity sets up an ethical dilemma. By the inclusion of future scenarios, there could be inferred justification for these futures. It must be made clear that finding an ethically acceptable management plan cannot be presented as an ethical justification for production of more waste.

- The ethical considerations and the limits of our science and technology require that NWMO recognize that no single management option or stepwise management plan under consideration is a long-term solution to the hazards of nuclear fuel waste. The Roundtable on Ethics discusses the need for "a solution that is good absolutely." (NWMO Roundtable on Ethics, 2004)
- Nuclear fuel waste management is one problem among the many problems of the nuclear fuel cycle starting from the mining of the uranium. Managing one aspect does not address the other issues and use of that management scheme to promote increased production increases the problems that exist throughout the cycle. The Roundtable on Ethics did not address this ethical point when they stated, "For the creation of new wastes to be ethically justified, an ethically sound waste management method must exist, not just a least-bad one." (2004, p.4) The United Church submits that even "a solution that is good absolutely" for nuclear fuel waste could not be used to justify new production and points to the problems within the nuclear power cycle.

With the caution of the preceding paragraph in place, the United Church asks the NWMO to include the impact that the use of enriched uranium fuel (presently under consideration in Canada) and MOX fuel (also under consideration) would have on hazard, on containment, on spacing, on security, and on criticality in nuclear waste management and the implications that the use of weapons-grade plutonium in MOX fuel in Canada would have.

Consideration of the recommended management option must be linked inextricably with the implementation of a new energy program based on energy efficiency, energy conservation, use of energy from renewable resources used in a sustainable manner, and safe, environmentally clean processes. There is the potential for a nuclear waste

management plan, as part of the promotion of nuclear power, to increase energy consumption and undermine responsible energy conservation.

The United Church asks the NWMO to make it clear in its report that the nuclear waste management issue can not be adequately addressed without a full and open debate on the future of nuclear power, which must include an integrated, life-cycle environmental and financial assessment of the whole nuclear fuel cycle, and should be done within an examination of Canada's energy options.

The United Church recommends that

- NWMO acknowledge in its final report that policies regarding the future of nuclear power in Canada and Canada's nuclear exports are key variables influencing the social acceptability of any waste management approach; and
- NWMO take into account that an assessment of social acceptability premised on a finite waste stream is not transferable to scenarios in which nuclear power continues indefinitely.

SOCIAL ACCEPTABILITY

The United Church appreciates that the staff of NWMO have moved away from the adversarial settings of past public participation processes for nuclear issues and made significant efforts to use a variety of engagement activities with open reporting on their website. There is greater potential for dialogue but the time frame is very short for the public to be empowered to speak on this issue. Also, the ability of NWMO to engage some groups and individuals has been hampered by the level of distrust in the government, the nuclear industry and the present process.

Participation without intimation is essential. Employees of the industry, regulators and the government have to be able to express their views without fear of job loss or demotion. Within any management plan, the required legislative framework should specify whistle blower protection legislation as one of the essential mechanisms to ensure meaningful participation of the workers.

For informed participation, reliable, balanced information must be shared. Former Moderator of the United Church, the Very Rt. Rev. Dr. Lois Wilson, a member of the Seaborn Panel, noted that "the main problem we met in all our hearings was the secrecy surrounding this subject and the problem of getting accurate information from both the opponents and the proponents." (Wilson, 2001) There is important material arising from the many engagements and there are some scholarly reports within the Background Papers, all posted on the NWMO website. Apart from the Seaborn Panel's report, it is not obvious what other material from the volumes of information generated in connection to the Seaborn Panel Hearings has fed into the present process. Also, other material outside of that posted at the NWMO website is of importance, and the mechanism for its inclusion is unclear.

- The United Church encourages the NWMO to seek out relevant research and identify gaps; all references should be cited in NWMO documents, including sources for data in assessments; citations should be in a standard academic format and these sources should be publicly accessible.
- The United Church asks the NWMO to fill a gap already identified, avoiding a failing in the material brought to the Seaborn Panel, by obtaining and making available an up-to-date, well-referenced, balanced presentation of the facts, controversies and uncertainties of the nature of the problem, the nature of the hazards, the time frame of concern, the human health issues, "acceptable risk," and the risks for non-human life.

Again, the three year time limit has set a frame which undermines broad-based public engagement. It is not only difficult for people to absorb this material and respond in a thoughtful and informed manner, there is little time for experts and NWMO staff to gain insight from these engagements and incorporate that insight. This re-enforces the necessity that this process be insured through application of the Access to Information Act to the NWMO and that recommendations on the continued engagement of the public be included in the final report from NWMO. The United Church recommends that the importance of social acceptability as set out in the Seaborn Panel report be upheld and that emphasis on participatory processes be continued and strengthened.

To illustrate how the social complexities in the issue of risks require that public concerns be included in the scenarios and assessments, consider the issue of the future of nuclear power:
Among concerns that relate to the future of nuclear power, one is the concern that aspects of the nuclear fuel waste issue which are predictable if present plants run their expected life-span, become unknowable if nuclear power production is expanded:

- *the risks associated with the operation of nuclear power plants will be on-going with no foreseeable end;*
- *issues related to decommissioning of plants are similarly on-going;*
- *the risks associated with the on-site wet and dry storage of newly produced spent fuel will continue with no predictable end, and*
- *instituting off-site long-term management will not reduce on-site security risks as long as production continues;*
- *risks associated with any transportation and siting that might be required in the yet-to-be chosen long-term management option will continue for an unpredictable time involving an unpredictable quantity of waste;*
- *the scale of the long-term management is unpredictable.*

If the nuclear waste management options is framed for the present wastes and expected wastes from existing plants run for their unrefurbished life-span and the public is willing to accept the additional risks of transported waste or siting issues, that same public may find the unknowns and risks unacceptable, and therefore any management option may become unacceptable, when there is no guarantee that nuclear power is ended.

Social acceptability is dependent on evaluation of the nuclear waste issue in the full context in which it is perceived by society. Bounding the issue to exclude concerns identified as relevant to society will lead to the same socially unacceptable issues against which the Seaborn Panel warned.

CONTAINMENT and HAZARD REDUCTION

There is at the moment *no* safe "solution " to the "problem" of highly radioactive waste. Though there *may* in future be a "safe solution," at the present state of our knowledge it cannot be *known*, in advance, to be safe: there are too many uncertainties in the data, in the methods and in the models. Fundamental concerns arise with modeling and the degree of confidence that is to be placed on figures projected over these long time frames. Even if the best assurance is one of extremely high probability of 'safety', the risk would not be acceptable when the potential for harm that would result from the low-probability event could threaten the continuation of life in the area.

The three management options under consideration are containment plans. The disposal option having been termed a containment plan that is an ultimate dilute and disperse option (Schader-Frechette, 2003) because the design includes containment break-down. The United Church has concerns about the ability of all the long-term management options to provide protection for the health and safety of future generations because of the risks and uncertainties, especially for the long-term, and the burden imposed on future generations if problems arise with the containment as a result of unforeseen complications or inadequate technology. The United Church recommends that the waste remain retrievable for the purpose of ensuring containment and employing potential hazard-reduction techniques.

The ethic of responsibility urges us to not only contain this waste , it calls us to focus on accelerated reduction of the hazards of nuclear waste. However, our science and technology is very limited in this area. Present reprocessing and the use of neutron-capture transmutation within the recycling process have a number of environmental problems, including those arising from the need for liquid partition, and this reprocessing adds to the proliferation risk. The United Church recommends that Canada support research in the search for the specific wavelengths of energy or other tools to safely jog excess neutrons, alpha particle and beta particle from unstable nuclei, in an absorbing environment when these nuclei are in a nuclear waste mix of radioactive nuclei of other isotopes and other elements. This requires more than a watching brief on transmutation developments, it requires commitment and leadership in Canada.

The NWMO needs to establish the objective for which the retrieval option is intended. The ease, the safety and the expense of retrievability are set in part by the intention of retrievability at time of design. Even then, conditions and changes that arise over time may render the intended retrieval too hazardous.

NWMO should indicate where and how the recommended management option would allow responsiveness to new developments, to ensure that the management option allows

waste retrieval and can incorporate continuous learning, including the ability to safely permit change to a different management option. Also, the recommendation should present social and institutional requirements for ensuring ongoing transfer of knowledge about the history of the waste, the nature of the hazards, the technology and management design, the wisdom and values to future generations for maintaining operations and coping with unanticipated events.

It should be our present focus:

- to limit the quantity of high level nuclear waste, by limiting production;
- to contain safely for the short-term what has been produced, using the precautionary approach;
- to commit to support research focused on accelerated reduction of the hazards of the existing nuclear waste in a manner that does not add to the proliferation risk.

VI. BENEDICTION

The current NWMO dialogue has made a fascinating beginning. Not often are Canadians from all walks of life invited into a dialogue which could affect decisions being made by industry and government. If this dialogue process were to be continued, it could engender trust between the government (exercised in part through nuclear regulators) and the public.

This Dialogue could move us from our present concern about what substances may or may not be put in our own backyards to what is of national, even global concern. Our neighbour is not just next door, our neighbour is not just downwind, our neighbour is in an area that covers the whole planet and includes future generations. Justice demands that no further damage be done to Aboriginal land and people but only healing actions be taken.

The problems faced by the NWMO and by all of us can be seen as an opportunity for education regarding our energy consumption patterns and past mistakes. (Wilson, 2000) We are invited by this challenge to envision a world free of nuclear power and one day free of nuclear weapons. If we had not embarked on the nuclear path, we would be free of the specter of a nuclear plant meltdown and free of the guilt of contributing to the nuclearization of other countries. Now is the best time to end that path.

The Dialogue itself has moved the issue into a broader arena, a web of life discourse, as our understanding of our place in creation demands humbler acknowledgment of our place in the web of life and greater responsibility to look beyond self-serving values.

Ethics have shifted "from hierarchical authority to grassroots, consensual, experiential authority; from emphasis on private good to common good; from emphasis on individualist to social ethics." (UCC, 1996) We might now add "to environmental ethics."

Through Creation we have been blessed. Let us now ensure the continuation of this blessing from generation to generation forever.

In many ways our civilization is at a crossroads. Our choice is not among various management options but between the life of our environment and the continuation of an energy-greedy society at the expense of God's Creation and of the global citizenry.

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Appendix
to Submission 1 by The United Church of Canada to the
Nuclear Wastes Management Organisation
December 2004

A United Church of Canada Ethical Lens for Viewing the Issue of Nuclear Wastes

An Integration and Commentary on:
One Earth Community – Ethical Principles for Environment and Development , a policy statement adopted by the General Council of The United Church of Canada, August 1992
and
The Earth Charter – prepared by the Earth Council and endorsed by the General Council of The United Church of Canada, August 2003

Policy statements are adopted within the United Church of Canada through a democratic process. Congregations appoint representatives to Presbyteries which make up regional Conferences from which delegates are appointed to meetings of the General Council. At General Councils, policy proposals are considered as they have been submitted by congregations, presbyteries and conferences and from national committees. The policy proposals are debated and voted upon.

The following "ethical lens" used by the United Church of Canada in preparing our submissions for the Nuclear Waste Management Organisation (NWMO) is based in the 12 principles adopted in August 1992 by the United Church's General Council in the statement One Earth Community – Ethical Principles for Environment and Development. The preparation and adoption by the Church of this policy statement was stimulated in part by the secular and inter-faith discussions leading up to the Rio Earth Summit (June 1992) about a possible Earth Charter. Since then, an Earth Charter has indeed been prepared through a wide-ranging engagement of civil society groups around the world and was endorsed by the United Church of Canada's General Council in August 2003.

In this section, each of the *One Earth Community* (OEC) principles in bold is followed by excerpts from the *Earth Charter* (EC) in italics.

1. Human societies must bear a responsibility toward the Earth in its wholeness. (OEC 1)

A. *Respect Earth and life in all its diversity*

i) Recognise that all beings are interdependent and every form of life has value regardless of its worth to human beings. (EC 1.a)

ii) Affirm faith in the inherent dignity of all human beings and in the intellectual, artistic, ethical, and spiritual potential of humanity. (EC1.b)

B. *Care for the community of life with understanding, compassion, and love*

i) Accept that with the right to own, manage, and use natural resources comes the duty to prevent environmental harm and to protect the rights of people. (EC 2.a)

ii) Affirm that with increased freedom, knowledge, and power comes increased responsibility to promote the common good. (EC 2.b)

2. To be both people-oriented and ecologically sound, all development strategies must be founded on a just international economic order, with priority for the world's poor. (OEC 2)

A. *Build democratic societies that are just, participatory, sustainable, and peaceful.*

i) Ensure that communities at all levels guarantee human rights and fundamental freedoms and provide everyone an opportunity to realize his or her full potential. (EC 3.a)

ii) Promote social and economic justice, enabling all to achieve a secure and meaningful livelihood that is ecologically responsible. (EC 3.b)

B. *Affirm gender equality and equity as prerequisites to sustainable development and ensure universal access to education, health care, and economic opportunity.*

i) Secure the human right of women and girls and end all violence against them. (EC 11.a)

ii) Promote the active participation of women in all aspects of economic, political, civil, social, and cultural life as full and equal partners, division makers, leaders and beneficiaries. (EC 11.b)

iii) Strengthen families and ensure the safety and loving nature of all family members. (EC 11.c)

C. *Uphold the right of all, without discrimination, to a natural and social environment supportive of human dignity, bodily health, and spiritual well-being, with special attention to the rights of indigenous peoples and minorities.*

i) Eliminate discrimination in all its forms, such as that based on race, colour, sex, sexual orientation, religion, language, and national, ethnic or social origin. (EC 12.a)

ii) Affirm the right of indigenous peoples to their spirituality, knowledge, lands, resources and to their related practice of sustainable livelihoods. (EC 12.b)

iii) Honour and support the young people of our communities, enabling them to fulfill their essential role in creating sustainable societies. (EC 12.c)

iv) Protect and restore outstanding places of cultural and spiritual significance. (EC 12.d)

3. Life styles of high material consumption must yield to the provision of greater sufficiency for all. (OEC 3)

A. *Eradicate poverty as an ethical, social, and environmental imperative.*

i) Guarantee the right to potable water, clean air, food security, uncontaminated soil, shelter, and safe sanitation, allocating the national and international resources required. (EC 9.a)

ii) Empower every human being with the education and resources to secure a sustainable livelihood, and provide social security and safety nets for those who are unable to support themselves. (EC 9.b)
iii) Recognize the ignored, protect the vulnerable, serve those who suffer, and enable them to develop their capacities and to pursue their aspirations. (EC 9.c)

4. Environmental destruction must stop and humanity must understand itself collectively responsible both for the destruction and for the repair thereof. (OEC 4)

A. *Advance the study of ecological sustainability and promote the open exchange and wide application of the knowledge acquired.*

i) Support international scientific and technical co-operation on sustainability with special attention to the needs of developing nations. (EC 8.a)
ii) Recognize and preserve the traditional knowledge and spiritual wisdom in all cultures that contribute to environmental protection and human well-being. (EC 8.b)
iii) Ensure that information of vital importance to human health and environmental protection, including genetic information, remains available in the public domain. (EC 8.c)

5. The rights of future generations must be protected. (OEC 5)

A. *Secure Earth's bounty and beauty for present and future generations.*

i) Recognize that the freedom of action of each generation is qualified by the needs of future generation. (EC 4.a)
ii) Transmit to future generations values, traditions, and institutions that support the long-term flourishing of Earth's human and ecological communities. (EC 4.b)

6. The carrying capacity of the Earth, regionally and globally, must become a criterion in assessing economic development. (OEC 6)

A. *Adopt patterns of production, consumption, and reproduction that safeguard Earth's regenerative capacities, human rights, and community well-being.*

i) Reduce, reuse, recycle the materials used in production and consumption systems, and ensure that residual waste can be assimilated by ecological systems. (EC 7.a)
ii) Act with restraint and efficiency when using energy, and rely increasingly on renewable energy source such as solar and wind. (EC 7.b)
iii) Promote the development, adoption, and equitable transfer of environmentally sound technologies. (EC 7.c)
iv) Internalize the full environmental and social costs of goods and services in the selling price and enable consumers to identify products that meet the highest social and environmental standards. (EC 7.d)
v) Ensure universal access to health care that fosters reproductive health and responsible reproduction. (EC 7.e)
vi) Adopt lifestyles that emphasize the quality of life and material sufficiency in a finite world. (EC 7.f)

7. The bio-diversity of the Earth must be respected and protected. (OEC 7)

A. *Protect and restore the integrity of Earth's ecological systems, with special concern for biological diversity and natural processes that sustain life.*

i) Adopt at all levels sustainable development plans and regulations that make environmental conservation and rehabilitation integral to all development initiatives. (EC 5.a)

ii) Establish and safeguard viable nature and biosphere reserves, including wild lands and marine areas, to protect Earth's life support systems, maintain biodiversity, and preserve our natural heritage. (EC 5.b)

iii) Promote the recovery of endangered species and ecosystems. (EC 5.c)

iv) Control and eradicate non-native genetically modified organisms harmful to native species and the environment, and prevent introduction of such harmful organisms.(EC 5.d)

v) Manage the use of renewable resources such as water, soil, forest products, and marine life in ways that do not exceed rates of regeneration and that protect the health of ecosystems. (EC 5.e)

vi) Manage the extraction and use of non-renewable resources such as minerals and fossil fuels in ways that minimize depletion and cause no serious environmental damage. (EC 5.f)

B. *Treat all living beings with respect and consideration.*

i) Prevent cruelty to animals kept in human societies and protect them from suffering. (EC !5.a)

ii) Protect wild animals from methods of hunting, trapping, and fishing that cause extreme, prolonged, or avoidable suffering. (EC 15.b)

iii) Avoid or eliminate to the full extent possible the taking or destruction of non-targeted species. (EC 15.c)

8. Militarism must yield to non-violent approaches to conflict resolution. (OEC 8)

A. *Promote a culture tolerance, non-violence, and peace*

i) Encourage and support mutual understanding, solidarity, and cooperation among all peoples and within and among nations. (EC 16.a)

ii) Implement comprehensive strategies to prevent violent conflict and use collaborative problem solving to manage and resolve environmental conflicts and other disputes. (EC 16.b)

iii) Demilitarize national security systems to the level of a non-provocative defence posture, and convert military resources to peaceful purposes, including ecological restoration. (EC 16.c)

iv) Eliminate nuclear, biological, and toxic weapons and other weapons of mass destruction. (EC 16.d)

v) Recognize that peace is the wholeness created by right relationship with oneself, other persons, other cultures, other life, Earth, and the large whole of which all are a part. (EC 16.f)

9. Decision-making for just and ecologically-sound development must ensure the participation of individuals and groups, especially those most affected by the project. (OEC 9)

A. *Strengthen democratic institutions at all levels, and provide transparency and accountability in governance, inclusive participation in decision making, and access to justice.*

i) Uphold the right of everyone to receive clear and timely information on environmental matters and all development plans and activities which are likely to affect them or in which they have an interest. (EC 13.a)

ii) Support local, regional and global civil society, and promote the meaningful participation of all interested individuals and organizations in decision making. (EC 13.b)

iii) Protect the rights and freedoms of opinion, expression, peaceful assembly, association, and dissent. (EC 13.c)

iv) Institute effective and efficient access to administrative and independent judicial procedures, including remedies and redress for environmental harm and the threat of such harm. (EC 13.d)

v) Eliminate corruption in all public and private institutions. (EC 13.e)

vi) Strengthen local communities, enabling them to care for their environments, and assign environmental responsibilities to the levels of government where they can be carried out most effectively. (EC 13.f)

10. Both opportunities for learning and access to knowledge must be assured in order to facilitate sustainable development. (OEC 10)

A. *Integrate into formal education and life-long learning the knowledge, values, and skills needed for a sustainable way of life.*

i) Provide all, especially children and youth, with educational opportunities that empower them to contribute actively to sustainable development. (EC 14.a)

ii) Promote the contribution of the arts and humanities as well as the sciences in sustainable education. (EC 14.b)

iii) Enhance the role of the mass media in raising awareness of ecological and social challenges. (EC 14.c)

iv) Recognize the importance of moral and spiritual education for sustainable living. (EC 14.d)

11. Development decisions must emphasize prevention of ecological damage. (OEC 11)

A. *Prevent harm as the best method of environmental protection and, when knowledge is limited, apply a precautionary approach.*

i) Take action to avoid the possibility of serious or irreversible environmental harm even when scientific knowledge is incomplete or inconclusive. (EC 6.a)

ii) Place the burden of proof on those who argue that a proposed activity will not cause significant harm, and make the responsible parties liable for environmental harm. (EC 6.b)

iii) Ensure that decision making addresses the cumulative, long-term, indirect, long distance, and global consequences of human activities. (EC 6.c)
iv) Prevent pollution of any part of the environment and allow no build-up of radioactive, toxic, or other hazardous substances. (EC 6.d)
v) Avoid military activities damaging to the environment. (EC 6.e)

12. Procedures and mechanisms must be established ensuring a transnational approach to environmental issues and disputes. (OEC 12)

A. *Ensure that economic activities and institutions at all levels promote human development in an equitable and sustainable manner.*

i) Promote the equitable distribution of wealth within nations and among nations. (EC 10.a)
ii) Enhance the intellectual, financial, technical, and social resources of developing nations, and relieve them of onerous international debt. (EC 10.b)
iii) Ensure that all trade supports sustainable resource use, environmental protection, and progressive labour standards. (EC 10.c)
iv) Require multinational corporations and international financial organizations to act transparently in the public good, and hold them accountable for the consequences of their activities. (EC 10.d)

These principles from One Earth Community and from the Earth Charter can be summarised as follows. Canada's response to the issue of nuclear wastes should:

1. reflect a responsibility to the Earth in its wholeness;
2. be founded on a just international order which is people-oriented, respects human rights, ensures the voice of the world's poor and is ecologically-sound;
3. promote change of lifestyle from high material consumption to greater equity and sustainability;
4. promote humanity's understanding of its collective responsibility for environmental damage and repair and that environmental damage must stop;
5. protect the rights of future generations;
6. not threaten the sustaining capacity of the Earth;
7. respect and protect the biodiversity of the Earth;
8. not contribute to militarization but promote a culture of tolerance, non-violence and peace;
9. ensure meaningful participation of individuals and groups in the decision-making processes;
10. assure opportunities for learning and access to knowledge;
11. be based on adequate environmental, social and cultural impact assessments;
12. hold authorities and corporations responsible for their actions domestically and internationally and ensure that Canada accepts its global responsibility to prevent environmental damage.