

# Social and Ethical Considerations in the NWMO Study

Jo-Ann Facella

Nuclear Waste Management Organization (NWMO)  
49 Jackes Avenue, Toronto, Ontario M4T 1E2  
jfacella@nwmo.ca

## Abstract

NWMO has attempted to build social and ethical considerations into both the determination of its study process and the study outcome. Through implementing an iterative and reflective process, guided by societal input and direction at key decision points and informed by the knowledge of scientific and technical experts, NWMO has attempted to identify a holistic and integrative framework to assess the appropriateness of each of the management approach choices. NWMO believes that the management approach which may be regarded by Canadians as socially acceptable, is the approach which responds most fully to the key values and objectives articulated by the citizens who have participated in our process of collaborative development. This paper briefly outlines NWMO's efforts to incorporate social and ethical considerations in to its study process, and lessons learned part-way through the study.

## I. Introduction

This paper briefly outlines the Nuclear Waste Management Organization's (NWMO) efforts to incorporate social and ethical considerations in to its study process, and lessons learned part-way through the study. The paper outlines how the NWMO has attempted to build social and ethical considerations in to both the determination of its study process and the study outcome. The NWMO's study process is designed to be an iterative and reflective one, guided by societal input and direction at key decision points and informed by the knowledge of scientific and technical experts. Through dialogue with a wide cross-section of Canadians over the course of its three year study process, NWMO has attempted to identify a holistic and integrative framework to assess the appropriateness of each of the management approach choices.

## II. Background

The NWMO was formed in response to federal legislation, the *Nuclear Fuel Waste Act*, brought into force by the Government of Canada on November 15, 2002. The Act required Canada's nuclear energy corporations – Ontario Power Generation, Hydro-Quebec and New Brunswick Power - to establish the NWMO for two key purposes. First, the NWMO is to conduct a study of approaches for the long-term management of nuclear fuel waste in Canada and recommend a preferred approach to the Government of Canada by November 15, 2005. Second, once the Government decides upon an approach, the NWMO is to implement that approach.

Under the Act, the NWMO must, at a minimum, study approaches based on three technical methods: deep geological disposal in the Canadian Shield; storage at nuclear

reactor sites; and centralized storage, either above or below ground. For each of these approaches, the NWMO must provide for:

- A comparative assessment of the benefits, risks and costs, *taking into account, the ethical, social and economic considerations* associated with that approach;
- An implementation plan setting out activities, timetable, public consultation plans and proposed means for avoiding or minimizing significant *adverse socio-economic effects* on a community's way of life or on its social, cultural or economic aspirations. [emphasis added]

In undertaking the assessment of long-term management approaches, the NWMO must consult the general public, and in particular Aboriginal Peoples, on each approach. The study must include a summary of the comments received by the NWMO as a result of this consultation.

### **III. A Responsive Study Process**

The NWMO has taken as its mission “to develop collaboratively with Canadians a management approach for the long-term care of Canada’s used nuclear fuel that is socially acceptable, technically sound, environmentally responsible and economically feasible.” NWMO’s mission is reflected in how we have approached the engagement of Canadians in our study, both in the way we asked for input and then used that input to shape the study.

The NWMO began its study with the understanding that technical and scientific experts can help us understand the *technical adequacy* of each of the management approaches available to Canada. They can also help us understand the impacts any approach may have on the *environment*, and whether this approach is affordable (*economically feasible*). However, the NWMO understands that it is necessary to move beyond technical and scientific experts to include the voices of a much wider range of citizens in order to judge the fourth element of its mission, *social acceptability*.

Scientific and technical evidence and analysis, while essential, will not be the sole basis of NWMO’s decision-making. The views of Canadian society, in judging benefits or risks, and assessing the social implications of various approaches for long-term management, are critical to the development of a socially acceptable recommendation. Canadians expect that the best scientific and technical knowledge must be brought to bear in identifying and understanding the source and nature of risk and the ways in which safety can be assured. However, the decision as to whether safety has been assured to a sufficient degree to warrant implementation is a societal one and will be affected by social notions of what constitutes risk and safety and thresholds to be met.

NWMO believes that the management approach which may be regarded by Canadians as socially acceptable, is the approach which responds most fully to the key values and objectives articulated by the citizens who have participated in our process of collaborative development. NWMO’s process of working collaboratively with citizens to develop a management approach for Canada is designed to ensure that these values and

objectives are identified and understood, and form the road map for both the study and recommendation. In doing so, the NWMO is attempting to use the social and ethical considerations expressed by Canadians as a fundamental building block for the study.

At its simplest, the NWMO's study process involved asking Canadians for the list of values and objectives against which a management approach should be assessed, and then engaging Canadians in a dialogue to assess the approaches against that list. The study has been designed so that the approach which emerges as most responsive to these values and objectives will be judged the most socially acceptable of the options studied.

In this collaborative development process, NWMO's role has been to act as a facilitator of dialogue in an open forum where, as much as possible, all interested Canadians have access to information and the opportunity to put forward their opinions. The study process is designed in such a way that as many perspectives as possible are considered and used to shape each major decision point in the study.

NWMO designed its three-year study as a dialogue conducted over four phases: "Conversations About Expectations"; "Exploring the Fundamental Issues"; "Evaluating Management Approaches"; and, "Finalizing the Study Report". Each of these four phases focuses on a key decision point for the study, for which the direction of Canadians is elicited through dialogue, before proceeding to the next key decision point and phase of work. The four phases are supported by a series of milestone documents, designed to share what the NWMO has heard from Canadians, how this has shaped NWMO's thinking, and to elicit public feed back to shape and direct subsequent steps in the study. Through these documents, the NWMO has sought to make transparent its deliberations, to "think out loud", and to elicit comments and direction to help shape each key decision in the study.

The dialogue process seeks direction from Canadians at each of the following points:

- Identifying the questions to be asked and answered in the study, and the key issues to be addressed in the assessment of the management approaches
- Confirming the range of technical methods to be considered in the NWMO study
- Assessing the risk, costs and benefits of each management option through the assessment process
- Designing the overarching management structure and implementation plans for each management approach considered in the study.

For this public policy issue, the NWMO understands that all Canadians have an interest. We learned early on, from public attitude research, that the public attaches high importance to this issue, on an aided basis, and expects that the public, as well as experts, citizen groups, and governments will play an important role in the study. However, we also learned that most have little knowledge concerning the issue and little interest in becoming personally involved in the study. Recognizing that many members of the

public will not involve themselves in the discussion of this issue, although the inclusion of public input is considered key to a credible study process by the public, NWMO has sought to reach out to and deliberately include a diversity of voices. In this way the NWMO is attempting to ensure that a broad range of social and ethical considerations are raised for consideration in the study.

NWMO has sought this societal direction through a broad range of engagement and dialogue techniques, including traditional and more innovative approaches. In order to elicit a broad range of social and ethical considerations, the NWMO has used nation-wide surveys, focus groups, issue focused workshops and round tables, e-dialogues and deliberative surveys, and public information and discussion sessions. Some of these techniques have been used to ensure that NWMO has heard from a statistically representative cross-section of Canadians, including those who would not otherwise involve themselves in the study. Some of these techniques have been used to elicit the concerns of those who are interested in the issue. Some techniques have been used for more depth conversation among those with a specialized interest. Throughout, our web site has served as a platform, not only for making publicly available all reports commissioned by the NWMO, but also to report out on what was said through each of the dialogue initiatives and to invite submissions and comment from Canadians on any of these topics.

Each dialogue initiative has been conducted, and reported on, by third parties in order to ensure the accuracy and transparency of the reporting. Among the dialogue initiatives initiated to date are:

- A scenarios exercise in the early phases of NWMO's work: To explore the possible repercussions for future generations of decisions we make today, the NWMO worked with Global Business Network to bring together a group of individuals drawn from many interests. The group was charged with the task of identifying a range of plausible futures and conditions which might need to be faced in managing used nuclear fuel over the long term.
- Commissioned papers: Canadian and international experts were commissioned to provide up-to-date information on the current state of knowledge on issues related to the long term management of used nuclear fuel, including the status of biospheric and geospheric research, lessons learned from other experiences in hazardous waste management, financing considerations, and various aspects of our legal and administrative framework. Experts were also asked to explore how concepts such as adaptability, sustainable development, risk and uncertainty, security, and precautionary approach might apply to the study.
- A workshop with technical and scientific specialists from a wide range of fields: NWMO worked with McMaster University to convene a workshop to explore the technological requirements to allow for flexibility in decision-making, extended monitoring, retrievability, larger or smaller volumes of waste, different types of used nuclear fuel, and the development of new technologies and/or breakthroughs.

- A national citizens dialogue on values: To explore the values which citizens bring to bear in thinking about the long-term management of used nuclear fuel, the NWMO worked with Canadian Policy Research Networks to involve a cross-section of citizens across Canada in day long deliberative dialogue sessions. From this emerged a short list of priorities or “values” to drive decision making on this issue. The appropriateness of these values was subsequently confirmed through further dialogue with Canadians and so forms the foundation for the framework to be used to assess approaches.
- Dialogues with reactor site communities: Ongoing meetings with individual mayors, the Canadian Association with Nuclear Host Communities, and residents who attended our community discussion sessions and participated in our public opinion research. To ensure that the insight and experiences of these communities is factored in.
- Dialogues designed and conducted by Aboriginal Peoples: An early workshop on the subject of Aboriginal Traditional Knowledge identified some basic principles or values as the foundation for this knowledge-based approach, as it has developed through centuries of observation, wisdom and experience. These values are reflected in the “foundation of values and ethics” in the framework to be used to assess approaches.
- A roundtable of experts on ethics: The Roundtable on Ethics was established early in the NWMO’s mandate to deliberate on the range of ethical considerations which should be factored in to the study. Among the early advice we received was that rather than treating ethics as a separate and distinct assessment area, it would be preferable to embed ethical and value considerations in all aspects of the NWMO study. The Roundtable developed an “Ethical and Social Framework” composed of a list of principles and questions to help guide the NWMO’s activities. The six principles contained in this document have been confirmed as appropriate through subsequent public dialogue and form part of the “foundation of values and ethics” for the framework to be used to assess approaches.
- Public information and discussion sessions: In conjunction with an independent consulting firm, DPRA, a series of 121 public information and discussion sessions were convened in 34 locations across Canada. These sessions were designed to share highlights of the NWMO’s study to date and hear comments from interested Canadians.
- E-dialogues. In conjunction with Royal Roads University, a series of e-dialogues was conducted to explore issues of risk and uncertainty associated with the long-term management of used nuclear fuel.

The study process, and the way in which the NWMO has sought to elicit societal direction at each major step along the way, is designed to be responsive to what

Canadians told us about what an appropriate study process would look like. NWMO's study process is briefly outlined in Figure 1.

## Figure 1

### The Road Travelled – NWMO's process of collaborative development with Canadians

November 15, 2002

#### **Phase 1: Conversations About Expectations**

1. Determining: How should the study be conducted, **what questions should be asked and answered**, and what options should be studied? Through engagement with a broad cross-section of Canadians.
  - Guidance from public representatives, and individuals and groups involved in this issue, through face to face conversations with 250 individuals and representatives from: communities who are currently storing used nuclear fuel; political representatives at all levels of government; Aboriginal leaders; nuclear power plant workers, youth, environmental organizations, industry experts, faith communities, government agencies and parliamentarians. ...
  - Guidance from citizens through public attitude research: discussion group sessions; nation-wide telephone survey; deliberative surveys and submissions on web site.
  - Guidance from experts in other fields, through a series of papers to explore the insight which viewing this issue through frameworks applied to other difficult public policy issues might bring to this issue: sustainable development; precautionary approach; adaptive management; security; risk and uncertainty
  - Guidance from Aboriginal Peoples through a workshop to explore the framework inherent in Aboriginal Traditional Knowledge and the study requirements it suggests
  - Guidance 'from the future' through a series of workshops to explore possible futures which any management approach may need to address, and the questions which these raise for the study.
  - Advice from: ethical experts through NWMO's Roundtable on Ethics; and, NWMO's Advisory Council.
2. Creating the **information foundation** for the study and making it broadly available through NWMO's website. Through engagement of a broad cross-section of Canadian and international experts:
  - Learning from the past, and from international experience, through a series of background papers, designed to explore: 1) social and ethical considerations raised in previous exercises in Canada and internationally; and, 2) the state of scientific and technical knowledge on issues related to the study, both in Canada and internationally;
  - Engaging experts in dialogue on the fundamental issues: A series of workshops with experts in a variety of areas to further explore and identify: environmental considerations which need to be addressed in the study; scientific and technical considerations related to the storage and disposal, transportation and monitoring and management of used nuclear fuel.
  - Information and knowledge from the perspective of Aboriginal Traditional Knowledge, through dialogues designed and implemented by Aboriginal Peoples
  - Information and knowledge from the perspective of ethics, from NWMO's Roundtable on Ethics
  - Information and knowledge from citizens through submissions and deliberative surveys on web site.

#### **Phase 2 – Exploring the Fundamental Issues**

3. NWMO reports on what it has heard to date, how it has incorporated what it has heard in its work going forward, and NWMO seeks clarification and correction, with the release of its first discussion document, "**Asking the Right Questions ?**"
4. Identifying an **Assessment Framework** which reflects the values and concerns of Canadians, **describing the most practicable options** for Canada and beginning to identify advantages and limitations of each. Through dialogue with Canadians and desktop analysis:
  - Depth exploration of values through a national dialogue with citizens to identify and explore the values which we share as Canadians and which should drive decision-making on this issue
  - Comment on NWMO's work to date and input going forward through workshops conducted with citizen groups and organizations involved in this issue (National Stakeholder and Regional Dialogues); youth (Roundtable Dialogue with Youth at the International Youth Nuclear Congress); communities who currently host nuclear waste facilities (Community Dialogue Planning Workshop).
  - Advice and guidance through dialogues designed and implemented by Aboriginal Peoples, including an initial workshop exploring whether and how traditional knowledge and aboriginal wisdom may help guide the direction of the NWMO study
  - Guidance from citizens through public attitude research: discussion group findings, nation-wide telephone survey; deliberative surveys and submissions on the web site
  - Broadening and deepening the information foundation for the study by commissioning additional background papers, and workshops, designed to fill gaps identified through dialogue; and addition of detailed technical and engineering description of concepts, the culmination of several years of work by the nuclear energy corporations
  - Multi-disciplinary group struck to develop an assessment framework based on the direction which has emerged from dialogue with Canadians, and to apply this framework in a preliminary way against the concepts.

5. NWMO reports on what it has heard to date, how it has incorporated what it has heard in its work going forward, and NWMO seeks clarification and correction, with the release of its second discussion document, "**Understanding the Choices**".

### **Phase 3 – Evaluating Management Approaches**

6. **Confirming the framework** reflects the values and objectives of Canadians, **and identifying the strengths and limitations of the approaches**, through dialogue with Canadians:

- Guidance from interested Canadians through: 121 public information and discussion sessions held across Canada; a series of e-dialogues
- Guidance from citizens through public attitude research: Discussion group sessions; deliberative surveys and submissions on web site
- Guidance from: workshops conducted with citizen groups and organizations involved in this issue (National Stakeholder and Regional Dialogues); communities who currently host nuclear waste facilities; ongoing meetings with political representatives at all levels of government; roundtable with opinion leaders.
- Guidance from Aboriginal Peoples through dialogues they have designed and implemented
- Advice from: ethical experts through NWMO's Roundtable on Ethics; and, NWMO's Advisory Council.

7. **Further exploring the strengths and limitations of the options** through assessments using the framework, modified through dialogue

- Integrated assessment with respect to economic regions
- Additional assessment through lens of risk

8. NWMO outlines its thinking on the recommendation it plans to make to government, its thoughts on how this recommendation is responsive to the advice and guidance of Canadians, and seeks comment before formulating its final recommendation with the release of its "**Draft Study Report**".

### **Phase 4 – Finalizing the Study Report**

9. Fine tuning NWMO's recommendation in response to comments made by Canadians on the Draft Study Report.

- Method for soliciting comment from Canadians to be determined.
- Advice and guidance through dialogues designed and implemented by Aboriginal Peoples continues.

10. NWMO delivers its recommendation to Government on a preferred approach for the long term management of used nuclear fuel

*November 15, 2005*



#### **IV. A Responsive Framework**

The NWMO understands that in order for Canadians to have confidence in any approach for the long-term management of used nuclear fuel, the study must fundamentally reflect and respond to their values. Both the objectives we set for the management options, and the values we weigh in making a decision need to be consistent with our collective sense of how we want to live. Part of the challenge, therefore, is to develop and apply, as much as possible, a societally-directed framework to guide both the development and also the assessment of the management approaches. This framework is the foundation of the assessment of the approaches. It is also the launching point for the exploration and design of implementation plans.

In our early round of public engagement in 2003, the NWMO invited Canadians to identify issues and concerns that should be addressed in our study of management approaches for used nuclear fuel. Additional issues for our study surfaced through the large number of commissioned research papers, expert workshops and dialogues that we convened. Based on this input, the NWMO proposed a set of ten key questions to form the foundation for the assessment of management approaches. We published these questions in our first discussion document in November 2003, and in so doing, we asked Canadians if we were indeed “asking the right questions”.

Since release of the first discussion document, and through a number of major engagement initiatives with Canadians, the NWMO largely heard that, yes, we are asking the right questions. Based on what we heard, the NWMO concluded that these questions are a good starting point for the comparative assessment of management approaches and we have proceeded with the study on this basis.

The NWMO then asked a multi-disciplinary group of individuals to give some thought to how the ten question framework might translate into a formal assessment framework. The Assessment Team developed a framework which features eight objectives, with associated principles and a list of specific influencing factors. In suggesting this framework, the Assessment Team proposed a methodology and an approach for considering the breadth of factors which Canadians identified as important, in an integrated and systematic way.

In our second discussion document, the NWMO attempted to describe the assessment framework as developed through the study process. The framework described in this document, outlined in more detail in Figure 2, includes three core elements:

- Citizen Values: As identified through the National Citizens’ Dialogue and Aboriginal Traditional Knowledge Workshop;
- Ethical Principles: As identified by NWMO’s Roundtable on Ethics;
- Specific Objectives: Developed from the ten questions posed by Canadians, and the foundation of values and ethical principles expressed by citizens through dialogue.

Subsequent dialogue with Canadians has confirmed largely that the assessment framework as it has developed:

- Reflects the ten questions Canadians said are important, and the counsel of experts in a wide variety of knowledge areas, and
- Responds to the values Canadians have said are important in the selection of a management approach for Canada.

Preliminary application of this framework on the management approaches has begun to bring greater clarity to the nature of the societal choice involved in selection of a management approach for Canada. People have told us:

- Each of the options has specific, and quite different, strengths and limitations.
- No single technical method perfectly addresses all of the objectives which Canadians have identified as important. In order for a method to address one objective well, for instance ‘security’, it may need to include practices which would make the method less able to address another of the objectives, for instance ‘adaptability’. For this reason, it will be necessary to balance and/or trade-off achievement of some of the objectives against other of the objectives in weighing the relative merits of the management approaches.
- Well informed and reasonable people may disagree on how a particular method should be assessed, even against the same set of objectives. This disagreement may reflect different views on the nature of future society and environmental conditions within which the method would need to be able to safely operate. Do we want to plan for the possibility of weak and/or non-existent social institutions and extreme climate change effects far into the future, or do we want to count on the existence of strong societies and modest climate change in deciding upon a management approach today? This disagreement might also reflect different perspectives on the best means to address the uncertainty in predictions and calculations associated with the performance of the approaches over the long time-frame for which the used nuclear fuel will need to be managed.
- The way in which the technical method is implemented may be as important as the method itself in determining the appropriateness or acceptability of any management approach.

**Figure 2**

**The Assessment Framework which has emerged from dialogue**

**Foundation of Values and Ethics: Values and ethical considerations are by design embedded in the eight specific objectives**

**Citizen Values**

- Safety from harm: An overarching requirement. First and foremost, human health and the environment must be as safe as possible from harm, now and in the future.
- Responsibility: We need to live up to our responsibilities to ourselves and to future generations, and deal with the problems we create.
- Adaptability: We need to build in capacity to respond to new knowledge.
- Stewardship: We have duty to use all resources with care and to conserve, leaving a sound legacy for future generations
- Accountability and Transparency – To rebuild trust. Governments are ultimately accountable for the public good concerning safety and security but must involve citizens, experts and stakeholders in any decision-making. Honour and respect must be shown to all.
- Knowledge: We need to continue to invest in informing citizens, and in increasing knowledge, to support decision-making now and in the future.
- Inclusion: The best decisions reflect broad engagement and many perspectives; we all have a role to play.

**Ethical Principles**

- Respect for life in all its forms, including minimization of harm to human beings and other sentient creatures.
- Respect for future generations of human beings, other species, and the biosphere as a whole.
- Respect for peoples and cultures.
- Justice across groups, regions, and generations.
- Fairness to everyone affected and particularly to minorities and marginalized groups.
- Sensitivity to the differences of values and interpretation that different individuals and groups bring to the dialogue.

**Specific Objectives: From the ten questions posed by Canadians, and the foundation of values and ethical principles expressed by citizens, eight specific objectives have been identified to guide the assessment**

1. Fairness: To ensure fairness (in substance and process) in the distribution of costs, benefits, risks and responsibilities with this generation and across generations. The selected approach should produce a fair sharing of costs, benefits, risks and responsibilities, now and in the future. In addition, fairness means providing for the participation of interested citizens in key decisions through full and deliberate public engagement through different phases of decision-making and implementation.
2. Public Health and Safety: To ensure public health and safety. Public health ought not to be threatened due to the risk that people might be exposed to radioactive or other hazardous materials. Similarly, the public should be safe from the threat of injuries or deaths due to accidents during used nuclear fuel transportation or other operations associated with the approach.
3. Worker Health and Safety: To ensure worker health and safety. Construction, mining, and other tasks associated with managing used nuclear fuel can be hazardous. The selected approach should not create undue or large risks to the workers who will be employed to implement it.

4. Community Well-being: To ensure community well-being. Implications for the well-being of all communities with a shared interest (including host community, communities in the surrounding region and on the transportation corridor, and those outside of the vicinity who feel affected) should be considered in the selection and implementation of the management system and related infrastructure. A broad range of implications must be considered including those relating to economic activity, environmental disruption and social fabric and culture.
5. Security: To ensure security of facilities, materials and infrastructure. The selected management approach needs to maintain the security of the nuclear materials and associated facilities. For example, over a very long timeframe, the hazardous materials involved ought to be secure from the threat of theft despite possibilities of terrorism or war.
6. Environmental Integrity: To ensure environmental integrity. The selected management approach needs to ensure that environmental integrity over the long term is maintained. Concerns include the possibility of localized or widespread damage to the ecosystem or alteration of environmental characteristics resulting from chronic or unexpected release of radioactive or non-radioactive contaminants. Concerns also include stresses and damage associated with new infrastructure (such as roads and facilities) and operations (e.g. transportation).
7. Economic Viability: To design and implement a management approach that ensures economic viability of the waste management system while simultaneously contributing positively to the local economy. Economic viability refers to the need to ensure that adequate economic resources are available to pay the costs of the selected approach, now and in the future. The cost must be reasonable. The selected approach ought to provide high confidence that funding shortfalls will not occur that would threaten the assured continuation of necessary operations.
8. Adaptability: To ensure a capacity to adapt to changing knowledge and conditions over time. The selected management approach should be able to be modified to fit new or unforeseen circumstances. The approach should provide flexibility to future generations to change decisions, and not place burdens or obligations on future generations that will constrain them. The approach should be able to function satisfactorily in the event of unforeseen “surprises”.

## **V. The Common Themes We Have Heard from Canadians**

A number of themes have been articulated clearly and forcefully in each set of engagement activities – reinforcing the common ground on which citizens’ and experts’ views converge. Although there is some disagreement over the extent to which any of the approaches being studied addresses the values and objectives which Canadians have said are most important, we have heard consistently the following direction from Canadians:

- **Assume responsibility.** In citizens’ dialogues undertaken across the country, Canadians told us that this generation should act to ensure safety and security for people, their health and the environment – immediately and in to the future. For the public at large, this means taking the first concrete measures now towards a long-term management approach.
- **Adopt a staged approach.** Canadians said that a staged approach is important to preserve for future generations the opportunity to make decisions and influence the implementation in a way that reflects their own values and priorities. They told us that a responsive and responsible course of action must retain openness to new learning and be adaptable to incorporate new knowledge as it becomes available. Continuous learning should support careful, controlled improvements in operations and design, and should enhance performance, reduce uncertainties and improve economies.
- **Monitor emerging options** For many, support for taking action now is linked to a desire to see investments in research and monitoring of advances in science and technology. It was suggested that there may be technical methods which are not yet sufficiently mature to warrant consideration now, but may hold some promise in the future. In particular, interest was expressed in learning more about using and reusing nuclear fuel more efficiently, and reducing the hazards associated with it.
- **Ensure strong and effective oversight and institutions.** The selected management approach should be accompanied by a robust system of monitoring and oversight. Canadians support a role for many levels of government, regulators and oversight bodies, international agencies and watchdogs, and citizen oversight mechanisms. They believe the management process must be securely funded. They also consider it important that the NWMO itself be designed to assume its future role capably as an implementing organization. They see it as a priority to build and maintain the human capital required to sustain the capacity to manage the used nuclear fuel expertly into the future, as long as active management is required.
- **Inform and involve citizens and experts.** Engagement of both citizens and experts is seen as essential when key decisions are being made in the design, siting, environmental assessment and licensing processes, and in the ongoing operation of the approach. Canadians have said we must, in particular, understand the concerns of the affected regions and communities, and seek to equip the public with the capacity

to understand the issues, and remain informed and engaged on decisions affecting them. They want governments and industry to act transparently, and to include citizens and other stakeholders, both in decision-making and in the ongoing management of the used fuel. Aboriginal Peoples have emphasized the need for our engagement to be designed and conducted in a manner that is culturally appropriate and sensitive to their traditional methods of discussion.

- Ensure safety from harm. From our citizen dialogues, we heard that one overriding need is the basic human need to feel safe from harm. This need does not arise from a sense of fear, nor from an expectation of a risk-free world. Rather, it arises from a sense of responsibility to their generation and to future generations to take the necessary precautions. Public health and safety should drive decision-making.
- Flexibility is important. People expressed strong support for a management approach that is adaptable and flexible. Given the many layers of decisions involved in implementing a management approach over long periods of time, people told us we should not make more decisions now than are necessary and our knowledge allows. A phased approach would allow decisions to be carefully considered at each step, and adjustments made to the course as may be appropriate. A flexible approach should help provide opportunities for future generations to influence the management of the waste.
- Confidence in future science. People are optimistic that we will continue to learn in this sector as in all aspects of our society. Of particular importance for the policy issue of used fuel is that the selected management approach anticipates and is able to benefit from continuous learning and new information as it becomes available.
- Implementation is key. There is recognition that the decision-making and implementation process for Canada's used nuclear fuel will involve at least many decades. It will be important that the approach be implemented in a way which continues to be responsive to the values and objectives which have driven the recommendation of an approach. Over the course of dialogue, a substantial list of social requirements related to an appropriate implementation plan was identified.

## **VI. The Broader Context**

Some people have told us that, for them, decision making on this issue fits in to a broader social framework, a framework which draws in public policy considerations beyond the scope of the NWMO's mandate. The mandate which is laid out in the *Nuclear Fuel Waste Act* limits the NWMO's study to the management of used nuclear fuel. The broader context which some bring to this issue includes the following:

- Some told us that there is a need to assess the full cycle of nuclear materials, from mining through to the management of all forms of nuclear waste. We heard that a full

consideration of the social and ethical dimensions of any waste management decision necessarily requires examination of the activity which gives rise to the waste and all its component elements. Those who advocate for such a broad framing of the issue suspect that nuclear energy generation would be abandoned if the costs and benefits of the full life-cycle were examined.

- Many have spoken about energy policy, expressing a belief that source reduction and elimination should be the first step in any management program of used nuclear fuel. In the case of Aboriginal Peoples, they articulate a responsibility to protect and maintain the lands within their traditional territories, which requires Aboriginal Peoples to take a proactive role in energy conservation and alternative energy production. Often we have heard that nuclear energy should be phased out to eliminate the source of the waste.
- Others have expressed views that the nuclear fuel cycle not be considered. These Canadians feel that an assessment of energy generating methods would show that nuclear energy improves the quality of life of people around the world and may lead to an overall reduction in stress on the environment. They do not see the nuclear energy question as an issue that must be addressed before considering waste management approaches.
- Some have told us that they see the future of nuclear power as key to their assessment of the used fuel management approaches under examination. We heard that a used fuel management approach may be appropriate under one future scenario but not another. The absence of a fully articulated plan on the future of nuclear power is a fundamental limiting factor of the NWMO's study for those whose assessment of the appropriateness of approaches would differ, depending on the planned future for used nuclear fuel. They view the absence of such a plan as a key failing.
- We heard concerns that any decision on the management of used nuclear fuel may change the terms of the broader discussion of the future of nuclear energy. For instance, if a long-term approach for the management of used nuclear fuel is identified, would this serve as a *de facto* licence for an expansion of nuclear energy which would not have occurred otherwise? From those who are concerned about the appropriateness of nuclear energy, we heard the existence of a waste management plan should not be sufficient reason to expand an energy source which they feel should be the subject of its own assessment.
- Consistently we have heard that waste importation is not acceptable. There is a concern that the North American Free Trade Agreement might force Canada to accept nuclear waste from the USA, opening the door to bring in waste from other countries.
- Some have questioned the ability of the NWMO to arrive at a recommendation which protects the public interest. We heard concerns that because the organization is fully funded and organized by the producers of used nuclear fuel under the *Nuclear Fuel Waste Act*, it cannot be relied upon to be objective.

- The question of who should be involved in decision-making on this issue, the role they should play, and what constitutes sufficient and appropriate involvement continues to be a source of debate among some throughout the study. Some have argued that this is a matter for scientific and engineering experts who can make decisions based on facts. Some have argued that human values and ethics should drive decision-making and all Canadians should be involved. The more basic question being raised is: “What constitutes knowledge on this issue and who holds this knowledge?”

## **VII. Concluding Observations**

The NWMO’s efforts to include, in a fundamental and integrated way, social and ethical considerations in to decision-making on the long-term management of used nuclear fuel in Canada has brought NWMO to adopt an iterative and reflective study process. This study process has been shaped by the expectations which Canadians expressed at the inception of the study. Each of the four phases of the study has been shaped by the dialogue with Canadians in the previous phase.

The NWMO has attempted to capture the social and ethical considerations expressed by Canadians in the framework to be used to assess the management approach options. This framework has evolved over the course of dialogue associated with the first three phases of the study. It has evolved from a set of ten questions “to be asked and answered in the study”, to a more elaborated framework encompassing a list of citizen values, a list of ethical principles and a set of eight specific objectives with associated principles and influences or criteria. This framework will continue to be refined in response to dialogue throughout the balance of the study.

The central role of social and ethical considerations in identifying and determining the appropriateness of any management approach for Canada has implications for the design of any implementation plan. This is particularly the case given the long timeframe over which any management approach would expect to be implemented, at a minimum several decades and multiple generations. Implementation plans will need to include mechanisms to ensure that the implementation of the approach continues to reflect the social and ethical considerations of Canadians as these evolve over the period of implementation. This will necessarily form an important part of any recommendation to Government on a path forward for Canada.