

Public Confidence in the Management of Radioactive Waste: The Canadian Context

Workshop Proceedings
Ottawa, Canada
14-18 October 2002



Radioactive Waste Management

Public Confidence in the Management of Radioactive Waste: The Canadian Context

**Workshop Proceedings
Ottawa, Canada
14-18 October 2002**

© OECD 2003

NUCLEAR ENERGY AGENCY
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Pursuant to Article 1 of the Convention signed in Paris on 14th December 1960, and which came into force on 30th September 1961, the Organisation for Economic Co-operation and Development (OECD) shall promote policies designed:

- to achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries, while maintaining financial stability, and thus to contribute to the development of the world economy;
- to contribute to sound economic expansion in Member as well as non-member countries in the process of economic development; and
- to contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations.

The original Member countries of the OECD are Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The following countries became Members subsequently through accession at the dates indicated hereafter: Japan (28th April 1964), Finland (28th January 1969), Australia (7th June 1971), New Zealand (29th May 1973), Mexico (18th May 1994), the Czech Republic (21st December 1995), Hungary (7th May 1996), Poland (22nd November 1996), Korea (12th December 1996) and the Slovak Republic (14 December 2000). The Commission of the European Communities takes part in the work of the OECD (Article 13 of the OECD Convention).

NUCLEAR ENERGY AGENCY

The OECD Nuclear Energy Agency (NEA) was established on 1st February 1958 under the name of the OEEC European Nuclear Energy Agency. It received its present designation on 20th April 1972, when Japan became its first non-European full Member. NEA membership today consists of 28 OECD Member countries: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, Norway, Portugal, Republic of Korea, Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The Commission of the European Communities also takes part in the work of the Agency.

The mission of the NEA is:

- to assist its Member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally friendly and economical use of nuclear energy for peaceful purposes, as well as
- to provide authoritative assessments and to forge common understandings on key issues, as input to government decisions on nuclear energy policy and to broader OECD policy analyses in areas such as energy and sustainable development.

Specific areas of competence of the NEA include safety and regulation of nuclear activities, radioactive waste management, radiological protection, nuclear science, economic and technical analyses of the nuclear fuel cycle, nuclear law and liability, and public information. The NEA Data Bank provides nuclear data and computer program services for participating countries.

In these and related tasks, the NEA works in close collaboration with the International Atomic Energy Agency in Vienna, with which it has a Co-operation Agreement, as well as with other international organisations in the nuclear field.

© OECD 2003

Permission to reproduce a portion of this work for non-commercial purposes or classroom use should be obtained through the Centre français d'exploitation du droit de copie (CCF), 20, rue des Grands-Augustins, 75006 Paris, France, Tel. (33-1) 44 07 47 70, Fax (33-1) 46 34 67 19, for every country except the United States. In the United States permission should be obtained through the Copyright Clearance Center, Customer Service, (508)750-8400, 222 Rosewood Drive, Danvers, MA 01923, USA, or CCC Online: <http://www.copyright.com/>. All other applications for permission to reproduce or translate all or part of this book should be made to OECD Publications, 2, rue André-Pascal, 75775 Paris Cedex 16, France.

FOREWORD

Understanding the factors that influence confidence in the area of radioactive waste management is of strategic interest to the Radioactive Waste Management Committee (RWMC) of the OECD Nuclear Energy Agency (NEA). The Forum on Stakeholder Confidence (FSC) is a working party of the RWMC and acts as a centre for the exchange of opinions and experiences across institutional and non-institutional boundaries. In order to distil the lessons that can be learnt, the FSC promotes open discussion across the entire spectrum of stakeholders in an atmosphere of trust and mutual respect. Workshops in national contexts are the preferred means for interaction with a broad range of stakeholders. The third workshop of the OECD/NEA Forum on Stakeholder Confidence took place in Ottawa on 14-18 October 2002.

Public confidence is significantly affected by social considerations, such as the nature of decision-making processes, transparency of proponent and government activities, access to information, effective and appropriate mitigation measures, development opportunities and social justice issues. In order to increase public confidence, one must fully understand social concerns and how to address them. The workshop examined social concerns regarding radioactive waste management: what the concerns are, how they are identified, and how they can be addressed. The future enactment of the *Nuclear Fuel Waste Act* in Canada¹ and the agreement between the Government of Canada and the three local communities in southern Ontario provided the background for the discussions. The workshop was preceded by a one-day visit of the Port Hope area that included meetings with community representatives and project managers, and a tour of low-level waste management facilities.

The workshop enabled the exploration and analysis of the Canadian programme, by and for the FSC, as well as by and for the Canadian stakeholders. Sixty-nine people attended the workshop from 14 countries and 45 organisations. They ranged from representatives of municipal governments, non-governmental organisations and private citizens to government policy makers, regulators, implementers, consultants and university, social and media researchers. They included stakeholders in large-scale industrial projects (both nuclear and non-nuclear) and stakeholders directly affected by nuclear projects. About one half came from FSC member organisations; the remainder were Canadian stakeholders.

The Department of Natural Resources Canada (NRCan) was the local organiser and co-host with the NEA for the site visit and workshop.

These proceedings are published under the responsibility of the Secretary-General of the OECD. The opinions expressed are those of the authors and do not necessarily reflect the views of any member country or international organisation.

1. The *Nuclear Fuel Waste Act* came into force shortly after the workshop, on 15 November 2002.

TABLE OF CONTENTS

Foreword	3
Summary of site visit and workshop	9
International perspective	31
Background Session: The Canadian Context	35
<i>Chair: T. Seppälä</i>	
<i>P. Brown</i>	
The Nuclear Fuel Cycle, Radioactive Waste and Canadian Policy	37
<i>R. Ferch</i>	
Regulating Nuclear Waste in Canada	43
<i>C. Létourneau</i>	
The Nuclear Fuel Waste Act: Context, Public Confidence, Social Considerations....	47
<i>D. McCauley</i>	
The Port Hope Area Initiative	55
<i>G.R.M. Anderson</i>	
Message from the Deputy Minister of Natural Resources	61
Session I: What Are the Social Concerns?	63
<i>Chair: M. Fritschi, Moderator: C. Mays</i>	
<i>K. Storey</i>	
Social Impact Assessment: Identification, Management and Follow-up of Community Concerns Associated with Construction of the Hibernia Offshore Platform	65
<i>B. Seaborn</i>	
Criteria for Public Support for a Waste Management Concept: The Environmental Assessment Panel’s Recommendations	71
<i>P. Larcombe</i>	
What Are the Social Concerns? Consultation and Respect for the Rights of Aboriginal Peoples	75
<i>T. Włodarczyk</i>	
Understanding Community Traits – Understanding Public Concerns	77

<i>R. Zelmer</i>	
Port Hope and Area Property Value Protection Program: Creating Stability in the Marketplace	83
<i>C. Mays</i>	
What Are the Social Concerns? Round Table Discussions During Session I of the FSC Workshop in Canada.....	87
Session II: How to Address Social Concerns?	93
<i>Chair: P. Ormai, Moderator: J. Kotra</i>	
<i>D. McFarlane</i>	
Nuclear Power Plants in Canada: How We Address Community Issues and Concerns.....	95
<i>B. Holton</i>	
The Importance of Community Trust in Advancing Solutions to the Low-level Radioactive Waste Problem in the Port Hope Ontario Area.....	99
<i>L. Oates</i>	
Case Study: Adams Mine Landfill Proposal.....	103
<i>G. MacDonald</i>	
Observations on Stakeholder Confidence Related to Uranium Mine Waste Management in the Elliot Lake Region	107
<i>K. O'Hara</i>	
Trust, Risk and the Media.....	113
<i>J. Kotra</i>	
How to Address Social Concerns? Round Table Discussions During Session II of the FSC Workshop in Canada	119
Session III: Development Opportunities for Communities	123
<i>Chair: T. Merceron, Moderator: E. Atherton</i>	
<i>R. Austin</i>	
Development Opportunities for Communities: The Port Hope Area Initiative	125
<i>L. Kraemer</i>	
Development Opportunities for Communities: A Point of View from the Canadian Association of Nuclear Host Communities.....	129
<i>L. Simpson</i>	
Whiteshell Labs Closure: Crisis or Opportunity?	131
<i>A. Richards</i>	
Development Opportunities for Northern Aboriginal Communities from Saskatchewan's Uranium Mining Industry	135

<i>M. Simard</i>	
Urban Quality of Life and Industrial Project Management: The Case of Alcan Aluminium Smelter in Alma, Quebec, Canada.....	139
<i>E. Atherton</i>	
Development Opportunities for Communities: Round Table Discussions During Session III of the FSC Workshop in Canada	143
Session IV: Thematic Reports	151
<i>Chair: C.R. López</i>	
<i>D. Bard</i>	
Radiological Risk Assessment: Scientists' Concepts and Laypeople's Concerns.....	153
<i>J. Hetherington</i>	
Community Involvement: Stakeholder Learning in the UK and in Canada	161
<i>P.A. Fleming</i>	
Stakeholder Confidence: Observations from the Viewpoint of Ethics	169
<i>M. O'Connor</i>	
Building Relationships with the Wastes	177
List of participants	191

SUMMARY OF SITE VISIT AND WORKSHOP

Introduction

The third workshop of the OECD/NEA Forum on Stakeholder Confidence (FSC) was hosted by Natural Resources Canada (NRCan) for three days in Ottawa, following a one-day visit of the Port Hope area which included meetings with community representatives and project managers and a tour of low-level waste management facilities. The Ottawa workshop examined social concerns regarding radioactive waste management: what the concerns are, how they are identified, and how they can be addressed.

Sixty-nine people attended the workshop from fourteen countries and forty-five organizations. They ranged from representatives of municipal governments, non-governmental organizations and private citizens to government policy makers, regulators, implementers, consultants and university, social and media researchers. The participants included stakeholders in large-scale industrial projects (both nuclear and non-nuclear) and stakeholders directly affected by nuclear projects. About one half came from FSC member organisations; the remainder were Canadian stakeholders.

The workshop was structured with five half-day sessions. The opening half-day described Canadian policy and the regulatory environment for radioactive waste management and the two central case studies for the workshop: the Port Hope Area Initiative and the *Nuclear Fuel Waste Act*.

Three sessions addressed the topics “What are the social concerns?”, “How to address social concerns?” and “Development opportunities for communities”. Each of the sessions began with plenary presentations by five stakeholders. These “stakeholder voices” were followed by roundtable discussions. The participants were divided into eight tables, each including a mix of Canadian and other attendees. Each table discussed a set of pre-defined questions under the direction of a facilitator/rapporteur. The discussions from each round table were reported in a follow-up plenary.

The final half-day of the workshop was devoted to feedback from four thematic rapporteurs invited by the NEA. The thematic reports addressed the topics of radiological risk assessment, economics of local development, ethical inquiry, and stakeholder involvement.

This document gives an executive summary of the presentations and discussions that took place at the workshop. It also provides the Secretariat’s report of answers to audience questions and comments not found in speakers’ official proceedings texts. The structure of the document follows the structure of the workshop itself.

The NEA Secretariat also provides, in a separate section of the proceedings, a reflection placing the main lessons of the workshop in an international perspective.

Description of the two case studies

The Port Hope Area Initiative on local, historic waste

The first case study concerned the Port Hope Area Initiative, which arose following the failure of several initiatives to relocate low-level radioactive waste from past industrial practices out of the Port Hope area, which included the Port Hope, Clarington and Welcome municipalities. At present Welcome and Port Hope have been combined into one municipality.

The processing of radium and then uranium in Port Hope began in 1935. Over the years low-level radioactive wastes were deposited in various sites in the town and eventually in two waste management areas close by – at Welcome and Port Granby. Up to 12 000 m³ of what would later be called “tainted” soil had been used for landfill by private homebuilders, and some houses included construction materials that had been slightly contaminated within the factory confines. In the mid-1970s contamination in the town was recognized as a problem. A clean-up of the worst contamination was done by a Task Force established by the regulator: the majority of the more contaminated materials was moved off site to the waste management area at the Atomic Energy Canada Ltd. (AECL) Chalk River Laboratories. In 1982 the government established the Low-Level Radioactive Waste Management Office (LLRWMO) to take over from the Task Force and manage both the remaining waste in the Port Hope area and other historic wastes across Canada.

In the mid 1980s the operator of the Welcome and Port Granby (Clarington) waste management areas faced strong local opposition when it tried to site a new consolidation facility. The government intervened, establishing the Siting Process Task Force that in 1987 recommended a co-operative voluntary siting process. Adopting this recommendation, the government set up the Siting Task Force on Low-Level Radioactive Waste Management (STF), which sought voluntary communities across Ontario to join the process to find a host for a LLRW disposal facility. Twenty-six of the 850 municipalities expressed an initial interest, but eventually dwindled to one: Deep River (where AECL’s Chalk River Laboratory is located). In 1995 the STF recommended that a facility be constructed in Deep River. Subsequent negotiations broke down in 1997 when the federal government did not pursue a property value protection program that had formed part of the proposal worked out by the STF and the town.

Faced with nowhere to relocate the waste, the three Port Hope area municipalities approached the federal government proposing solutions of their own. Assisted by technical consultants, as well as by the federal government, the municipalities developed facility design guidelines reflecting their values and local objectives. A formal agreement was struck between the three municipalities and the federal government in March 2001, leading to the Port Hope Area Initiative managed by the LLRWMO. This partnership involves both technical and economic elements, described below under the site visit account and in workshop presentations. The facility design solutions will now have to be reviewed through an environmental impact assessment process.

The Nuclear Fuel Waste Act (NFW Act)

The second case study focussed on the *Nuclear Fuel Waste Act (NFW Act)*, which arose from the recommendations made by the Nuclear Fuel Waste Management and Disposal Concept Environmental Assessment Panel (known as the Seaborn Panel, for the name of its chairman).

Beginning in 1978, a disposal concept was developed by Atomic Energy of Canada Ltd (AECL) on behalf of the federal government. The Seaborn review Panel was established in 1989, and held public meetings through 1991 to establish the scope of the Environmental Impact Statement (EIS) guidelines, issued in 1992. In 1994 AECL submitted its EIS, and the Panel held open houses for 10 months to examine the EIS. At the end of 1995 the Panel requested more information from AECL, who replied in May 1996. The Panel held three phases of public hearings from March 1996 through March 1997.

The Panel's report was published in February 1998. The Panel recommended that a management agency be established "at arms' length" from the waste producers. Its role would be to develop appropriate nuclear fuel waste management options, consult the general public, and finally, make a recommendation to the government. The Panel's observations on the need for broad societal acceptance of the nuclear fuel waste management policy and approach shape the *NFW Act*, which came into force shortly after the workshop on November 15, 2002. The Waste Management Organization created by the *Act* must render its recommendation on the preferred management option by November 2005.

Site visit to the Port Hope area

Located one hour east of Toronto on Lake Ontario, Port Hope is one of Ontario's best-preserved Victorian towns. It is also home to the only uranium conversion facility in Canada (one of only four in the western world), which began its production of radium and uranium in 1935.

The FSC site visit preceding the workshop began with a traditional Canadian Thanksgiving dinner and an overnight stay in bed & breakfast hotels in the Heritage District. The converted Victorian dwellings are patronised year round both by Toronto tourists and by professionals involved with the waste management activities. This first contact with the town was very much appreciated by the FSC visitors. It allowed direct conversation with a few local people and helped place the next day's discussions in context.

FSC delegates visited areas of low-level radioactive waste contamination, including historic waste management facilities that are targeted for cleanup and consolidation under Canada's Port Hope Area Initiative. These sites contain approximately 1 million m³ of historic low-level radioactive waste and associated contaminated soil, and will be cleaned up and managed in new, local long-term facilities. Staff from both the LLRWMO and from Cameco, owner-operator of the facilities, accompanied and informed the delegates. Together they visited the Welcome waste mound and water collection/treatment installation (an open area surrounded by light woodland and bordered by a highway), the Pine Street Facility in residential Port Hope, and the Port Granby lakefront storage site in neighbouring Clarington. Delegates also caught sight of the Cameco refinery buildings and the waterfront and river areas targeted for clean-up and leisure development (sailing and fishing).

Port Hope Mayor **Rick Austin**, his predecessor **Ron Smith**, and **Ian Angus**, former Reeve (Mayor) of Hope Township, along with municipal administrators and the Senior Planner from Clarington, attended a working lunch with the delegates and spoke of the process through which the Port Hope Area Initiative came to be. As children the town officers had played in areas where LLW from the refinery had been dumped – no one knew it might be dangerous. The first anyone heard of it was in the 1970s when trees at the bottom of St. Mary's school yard died and families began to wonder what health consequences might be in store for residents themselves. The presence of toxic industrial waste in the community also became visible in a cow found "belly up" downstream from the Welcome site, where arsenic (used in the uranium refining process) had leached into the stream.

Clean-up activities and siting efforts were carried out (as described above). When the federal effort to find an outside host community failed, the elected officers felt that a 20-year period of concern was dragging on too long. It was important to “just get on with it and clean it up”, and thereby address potential stigma issues that had long been with the community. As Port Hope had earlier refused the operator’s project to consolidate the wastes at Welcome, the municipality “had to become a problem solver”. Working groups were formed, actively building relationships with the owner-operators and federal ministries. The working groups attempted to interest and consult residents, who mainly agreed that the municipality should resolve the problem. According to the municipal officers, the townspeople felt little fear because the wastes have very low levels of radioactivity. Still, they found, it was important to take the time sometimes “8-hour days and 7-day weeks” for the mayor to listen to residents’ concerns and, throughout the process, slowly become an educated community. Peer-reviewed epidemiological studies reassured the elected officers, showing that the local population’s health record cannot be differentiated from the provincial average.

The future facility concepts reflect local values. Among the most important goals for the Port Hope municipality was to see any waste management area fully compatible with future recreational use. The “never-ending cycle” of wastes trickling down from the Welcome hilltop into settling ponds, only to be placed again at the top of the mound, had to be interrupted. “If citizens can walk and play there, it shows everyone it is safe.” Along with the gain in safety, officers sought the added value of a positive image carried away by tourist visitors “turning lemons into lemonade”. This socio-technical concept implies, inter alia, full encapsulation of wastes, an aboveground storage facility and long-term monitoring.

The municipality of Clarington, in contrast, judged that a primary goal was to avoid moving or disturbing the wastes currently deposited in Port Granby. This resulted in a design for bolstering, monitoring and maintaining the lakefront site over the years. The municipal representatives were keen to point out that this is not a disposal project, but rather a long-term waste management project. The period of 500 years was evoked. At one point the federal nuclear regulator suggested that the wastes could be disposed in nearby underwater limestone caverns. Monitoring would be possible, but if it failed over time the disposal would be passively safe. From this point of view, the aboveground solutions chosen by the municipalities could be called technically sub-optimal. Ian Angus pointed out, however, that the limestone cavern solution was socially sub-optimal in that *residents didn’t trust that solution*. They preferred that the wastes be recoverable such that new detoxification techniques, if any are discovered, may be applied in future. On another level, the caverns solution could not be preferred because the federal government proposed an unacceptably small amount of accompanying compensation. Ron Smith (who had been “intrigued” by the solution) said that the process “was not a bidding war” and that the “community couldn’t be bought”, but that the undervalued compensation package “couldn’t be put to the public”.

Under the present agreement, economic concerns are met by a Property Value Protection Programme and by a \$10 million (Canadian) grant to each municipality, free of lien when each future facility will have been completed and licensed. The municipal officers view the federal government’s taking responsibility for historic wastes as “only fair”, given the national benefit derived from uranium over generations in both wartime and peaceful contexts. They view the negotiated grants to the communities, which recognize their new contribution to the nation, as modest in regard to the immense sums involved in the energy industry.

Delegates noted that the agreed solutions might not be feasible in a smaller country with fewer resources. However, reasonable expenditures requested by a community where feasible can be seen as an investment, justifiable in that they offset potential increases in waste management costs over the long term. The Port Hope Initiative appears to reflect the availability of resources, the

determination of the municipalities, and the resolution by the federal government to find solutions satisfactory to local stakeholders.

The formal Legal Agreement signed in March 2001 is a contractual guarantee of the municipalities' requirements and objectives, and they draw confidence from their ability to withdraw from the process if these are not honoured. Officers also state that redrawing an agreement if the current guarantee fails would require elaboration by the full community in public hearings, and for the sake of credibility could not be worked out by a closed committee.

The identified solutions for managing the relevant waste have still to be reviewed through an environmental assessment process. The latter is regarded with confidence as the opportunity to address any remaining technical questions and social impacts. The municipalities consider that if the environmental assessment process points to outcomes not foreseen in the original agreement, e.g., moving certain wastes, then the formal Agreement between the government and the municipalities will need to be re-negotiated.

Workshop opening session on National Policy and Port Hope Case

T. Seppälä, Head of Communication of POSIVA, Finland, opened the Ottawa workshop. He recalled the experience of the previous workshop in Turku (Finland), and referred to the defining period in Canada with the entering into force of Bill-C27 known as the *Nuclear Fuel Waste Act (NFW Act)*.

P. Brown, Director of the Uranium and Radioactive Waste Division of NRCan, stated that nuclear energy is an important part of Canada's diversified energy mix and falls within both federal and provincial jurisdiction. Uranium mining and fuel production also represent a great stake for the nation. Canada is the world's third resource base for uranium after Australia and Kazakhstan, and is the leading producer of uranium. At present rates of extraction, Canadian uranium could fuel the western world's reactors for 20 years, and meet North American demand for sixty. Canada is also a world leader in reactor design and sales. All aspects of the nuclear fuel cycle are represented in Canadian industry.

The Government of Canada wants to ensure that the public has confidence that operations at each step of the nuclear fuel cycle are carried out in the best interest of Canadians. Federal policy is to manage radioactive wastes to protect human health and the environment, and ensure that those who benefit from the waste-producing activity bear the costs of long-term management. The "polluter pays" principle is central to Canadian law and tradition: owners are responsible for establishing, funding and carrying out acceptable waste management plans. Where no owner can be identified, or held responsible, the federal government recognises its residual responsibility. Here the LLRWMO takes over remedial management duties.

Regarding low-level waste, Government will respect the community-driven process and municipal interest in the Port Hope area, with a view to building confidence not only between the parties themselves, but broad public confidence in the final solution.

High-level nuclear fuel waste, produced in volumes of less than 2000 tonnes annually, is currently stored at the reactor sites. Canada has no plans to reprocess or recycle it. With the Seaborn Panel's 1998 recommendations in mind, and after further consultations with stakeholders, the Government of Canada developed the 2002 *Nuclear Fuel Waste Act*. This law opens the search for a long-term management solution.

R. Ferch, Director, Wastes and Geosciences Division of the Canadian Nuclear Safety Commission (CNSC), outlined stakeholder input to facility licensing. The CNSC is a 7-member independent public tribunal supported by 400 staff. Its authority extends over the development, production, and use of nuclear energy, and the regulation of all uses (possession, transport...) of nuclear materials and is founded on the 2000 *Nuclear Safety and Control Act*. The CNSC also implements international controls, e.g., in the area of disarmament. New to the CNSC mandate is the active dissemination of knowledge.

Regulatory philosophy is based on two principles: (i) licensees are directly responsible for ensuring that health, safety, security, and the environment are protected and that international commitments are respected; and (ii) the CNSC is responsible to the Canadian public to assure that licensees are properly discharging these obligations. Regulations are performance-based rather than prescriptive, giving thus more freedom to the proponent to produce solutions and to the regulator in forming its judgements. Regulatory action is based on risk level. The CNSC views that the notion of risk covers also public perceptions and social concerns. Its mission is to act on behalf of “the public, i.e., all citizens” in Canada to ensure that requirements are met.

The first step in licensing any nuclear facility is an environmental assessment. Public consultation may include written comments on reports, or public hearings by the CNSC or an appointed review panel. Once determined that there will not be significant adverse environmental effects, the Commission holds two public hearings (full transcripts are published within days on the CNSC website). In the first hearing, the proponent presents a case to support its licensing application, and the CNSC staff presents its recommendations. Applicants are required in particular to present their public outreach programme (although the CNSC does not have formal evaluation criteria for outreach programmes at this time). In the second hearing (some 60 days later), Commission questions are answered, and other interested parties may intervene. The Commission then deliberates and its decision is recorded in a formal document. Technical requirements placed on the operator are contained in the license, which generally must be renewed after two to five years.

Generally there is no funding to bring interveners to Ottawa and the Commission’s hearings are rarely held outside the federal capital. Despite this, the CNSC has achieved considerable public participation in licensing processes. This participation has contributed to the credibility of the nuclear regulatory process in Canada seen as a key element in enhancing public acceptance of the nuclear industry and its activities, including waste management. The CNSC seeks to increase community awareness of its existence and role, in order to favour increased public participation when the opportunity is available.

The outcome of CNSC deliberations can be overturned in court on the basis of failed process (and not on the basis of content). For this reason, Commissioners retain their independence by minimizing contact with waste owners and implementers; most contact takes place through the secretariat or, on technical issues, through staff.

C. Létourneau, Senior Policy Advisor, Uranium and Radioactive Waste Division, NRCan, presented the new *Nuclear Fuel Waste Act*. The respective roles of the Government and waste owners were defined by the 1996 Policy Framework for Radioactive Waste. The goal is to implement long-term solutions in a safe, environmentally sound, comprehensive, cost-effective, and integrated manner. Health, environment, safety and security requirements are legislated by the 2000 *Nuclear Safety and Control Act*. The *Nuclear Fuel Waste Act (NFW Act)*, set in force on November 15, 2002, deals essentially with financial and socio-economic considerations.

The *NFW Act* legislates these measures:

- Nuclear energy corporations must set up a waste management organization (WMO) as a separate legal entity to manage the full range of long-term activities.
- Nuclear energy corporations must establish trust funds to finance long-term waste management responsibilities.
- The WMO must submit long-term waste management options to Government (a substantial fine is levied for delay beyond the November 2005 deadline), and
- The Governor in Council will select an option from those proposed by the WMO.

Three options at least must be examined: geological disposal, centralised surface storage, and non-centralized storage at reactor sites. The WMO is not barred from presenting other options (including the do-nothing option); the Government must select one of the options submitted by the WMO.

At issue is increasing and maintaining public confidence in a long-term solution; this is founded, according to the Act, upon technical safety, financial aspects, and social considerations. Requirements on the WMO therefore include an analysis of ethical and social as well as economic and safety considerations associated with any option, as well as comprehensive Aboriginal and other public consultation. Embedding ethical requirements at the legislative level as Canada has done appears to be unique, to date, in the environmental field.

NRCan has created a new Nuclear Fuel Waste Bureau web site (<http://www.nfwbureau.gc.ca/>) dedicated to informing all stakeholders, particularly the public, on planned and current nuclear fuel waste management activities. It was developed in accordance with the principles of openness and transparency. It is meant to be interactive and public input is welcome. The FSC viewed “A Canadian Solution”, a video visible at the website and presenting fuel waste management issues, Canadian values, the *NFW Act* and the Bureau’s mandate.

The current Government of Canada is committed to addressing WM needs in this generation. Waste producers want a long-term, permanent solution. Finally, the towns hosting nuclear facilities today wish to know whether they will remain de facto storage sites or whether other solutions will be brought to bear. These three sets of actors applied the pressure and demand that resulted in the passage of the *NFW Act*.

D. McCauley, Senior Policy Advisor, Uranium and Radioactive Waste Division, NRCan, reviewed the Port Hope Area Initiative history. He recalled the key principles of the Cooperative Siting Process recommended by the Governmental “Siting Process Task Force” in 1987: (i) communities would volunteer to host the waste management facilities, (ii) the community should be a partner in the process, (iii) the community should have the right to select a preferred technical solution, and (iv) the community should be compensated for impacts associated with the facility and be provided with equity compensation to enhance its position in view of its willingness to assist society.

Respect for the Task Force recommendations can be seen in Government negotiations with the Port Hope area municipalities. The Government has accepted these requirements and responsibilities laid out by the municipalities:

- The community-based proposals would be documented in the legal agreement and would form its technical basis.
- A Property Value Protection Program would be established.
- Municipal compensation would be granted, for staff time spent, for mitigating any future impacts, and as an economic benefit.
- The municipalities control the final project solution retained after environmental assessment, to ensure that it continues to represent a community-based solution.
- The Government of Canada will be the owner of the long-term management facilities and the wastes therein and have the responsibility for monitoring and maintenance.

The environmental assessment phase of the Initiative is now underway.

Workshop Session I: What are the social concerns?

C. Kessler, Deputy Director of the OECD NEA, welcomed the delegates. The NEA has a significant set of stakeholder-centred programmes, and is happy to facilitate encounters like the Ottawa workshop bringing people together on a national and international level. **P. Brown** welcomed the participants on behalf of the Canadian Deputy Minister of Natural Resources. **Y. LeBars**, Chairman of the FSC and of France's Andra, recalled the workshop goals: to provide a review of the Canadian situation by and for stakeholders, but also to stimulate improvements in delegates' home programmes.

K. Storey, of the Memorial University of Newfoundland, defined Social Impact Assessment (SIA) as the advance analysis of "all social and cultural consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs, and generally cope as members of society".² Taking the example of the construction yard created at Trinity Bay to assemble the Hibernia offshore oil platform, Prof. Storey explained how the concerns and values of local area residents were identified and a management strategy designed to minimize social disruption associated with the huge project.

A formal public consultation process identified potential negative impacts linked to the large influx of workers expected for the project. Current residents of the small, established communities feared increased crime, increased cost of living, and disruption of their fishery. They preferred to forego economic benefits if social disruption could not be avoided. In response the proponent designed a high-quality work camp situated outside town. This was a major, and successful, component of the impact management strategy.

2. Prof. Storey quoted this definition found in a 1994 U.S. Department of Commerce guidelines document; see his bibliography in proceedings.

Lessons learnt indicate that:

- Previous community experience with large projects and positive anticipation of employment opportunities, combined with the proponent's community consultation process, helped develop trust and co-operation.
- The consultation provided a realistic picture of potential impacts, oriented mitigation strategies, and served as an opportunity for feedback and education.
- Contingency planning allowed the proponent to respond to events that could have produced negative social impacts (e.g., the actual number of workers rose sharply from estimates but could be accommodated).
- The work camp was a simple solution but it might not have been found without the joint identification of concerns and agreement on the objectives of impact management.
- Monitoring is vital to provide feedback to both proponent and community on how the project impacts evolve. In the Trinity Bay case, independent, "before, during and after" surveys document the success of the chosen impact management strategy and suggest a format for follow-up that could be adopted for other projects.

B. Seaborn spoke as Chairman of the former Canadian Environmental Assessment Panel on Nuclear Fuel Waste Management and Disposal Concept. Panel hearings revealed that RWM concerns were often linked with concerns over nuclear armament and large accidents like that of Chernobyl. The Panel spelled out conditions for the "broad public support" and "required level of acceptability" that they believed Canada's concept should demonstrate in order to be adopted. In many instances these highlight knowledge issues and information needs:

- The Canadian public must be well informed if it is to make decisions about the long-term management of nuclear fuel wastes.
- The agency responsible for management must conduct a sustained information and communications program and the communication must flow both to and from the public.
- The public must be aware of, and have participated in developing the decision-making process.
- The public must know the key points at which safety and acceptability are assessed, who makes the decisions, how disputes are resolved and how the needs of significant minorities are to be addressed.

At the outcome of their review of the AECL concept, the Panel considered that these conditions did not yet exist and thus no judgement of acceptability could be made.

Among the elements deemed essential by the Panel for gaining broad public support, Mr. Seaborn highlighted:

- An adequately funded process of consultation to ensure the participation of Aboriginal people, whose views, stakes, traditions and rights differ from those of other Canadians;
- The creation of a nuclear fuel waste management agency to overcome the lack of trust to which the proponent was currently subject;

- Development by the agency of at least three practicable options for long-term management so that the public and Government could weigh options rather than choose or refuse one;
- An ongoing and interactive consultative process, comprehensive of social, ethical and economic considerations, with broad representation and public involvement in the decision-making process.

Although all these recommendations have not been incorporated into the new law, the Chairman expressed satisfaction that action is being taken four years after the Panel report. Social concerns, he said, are no less daunting and are just as important as technical factors to developing good public policy. He hopes that the Parliament will be summoned to deliberate on NFWM choices despite the absence of this requirement in the *NFW Act*.

Mr. Seaborn pointed to two upcoming milestones when stakeholder discussion and involvement will be paramount. The first, in three years, is when the Waste Management Organization now created by the *NFW Act* presents options for long-term management and recommends its preferred option. The second is the selection of a site or sites for the waste management facility(ies). Mr. Seaborn noted that it is difficult to stimulate persons to join discussion of a “concept” and that NFWM does not have the visibility of, e.g., Medicaid. Both milestones imply the need to have national, and Aboriginal, public deliberation and consultation programmes in working order. Acceptance and support could be checked by polling and by focus group interviews.

P. Larcombe, Senior Manager, Winds and Voices Environmental Services, outlined specific social concerns, consultation requirements, and best practices for involving Aboriginal peoples in waste management decisions. Aboriginal communities as self-governing entities require recognition of the unique rights that they enjoy under Canadian legislation. Assimilating them to other stakeholder groups, they state, loses sight of their specific situation and sovereignty.

Aboriginal peoples share many concerns with other segments of the population. However, large-scale developments have the potential to impact on Aboriginal communities in an unusually broad and adverse way. This is because these communities are heavily reliant upon healthy environments and healthy natural resources in order to preserve and maintain their lifestyles, cultures, and economies. Specific Aboriginal concerns include:

- Maintaining safe travel and ease of access by water and land to, from, and within traditional territories.
- Protection of the quality and quantity of natural resources (water, land, plants and animals) important to lifestyle, culture and economy.
- Protection of important historic, cultural and ecological sites.
- Preserving the natural balance and health of the environment for the current and future generations.
- Sustaining and enhancing social, cultural and economic opportunities for community members.
- Protecting legislated and court-upheld Treaty and Aboriginal rights now and on behalf of future generations (i.e., to seven “cycles” or generations into the future, a traditional horizon of responsibility).

The Aboriginal communities see themselves as direct counterparts of the federal government. Consulting bodies must be sensitive to self-government practices in Aboriginal communities. Extra time – related to the possible lack of trained or mandated liaison personnel and to the self-government rights of Aboriginal communities – early involvement in planning, early effort to design a culturally appropriate consultation process, and adequate financial and technical resources are all required to do justice to the Aboriginal participation in waste management decisions.

T. Włodarczyk, Senior Consultant with Gartner Lee Limited, presented sociological traits that influence how a community views and handles a large infrastructure project. No two communities are alike, but such traits provide one source of SIA criteria.

One set of traits relates to the demographic properties of the community. This is meaningful for analysing potential project impacts because perceptions of *fairness* are related to who bears the impact. Consulting the different demographic groups uncovers different concerns. Older residents may focus concern on changes in community or way of life. Young people may be more concerned over cost of living changes. Men emphasize economic concerns, while women express concern for effects on their families, friends and future generations. Women also experience different effects than men, such as isolation in a rapidly changing or a new community.

Labour capacity is another significant trait. If the local labour force can fill the employment needs created by a project, the community may be more welcoming. If a community is isolated from other urban settlements, public concerns focus on the effects of worker influx. Communities with more diversified economies may be comparatively less affected by a single project, and thus may show comparatively lower concern regarding economic benefits, losses and other secondary effects.

Some major projects increase demand on local facilities or social services. If these prove insufficient, people come to feel that their quality of life is at risk. This points attention to municipal administrative capacity and economic traits. Communities with skilled staff and experience in negotiation, and those free of significant economic decline, manage changes most successfully.

If community beliefs, norms, values and aesthetics are not properly taken into account by project proponents this will create conflicts, as e.g., between Aboriginal and mainstream groups who place widely disparate social values on the natural resource base.

A past environmental incident will heighten public concern and the potential for community mobilisation. A negative experience and accompanying social stigma create psychological duress, but in the best cases may also increase community efficacy in dealing with environmental management problems.

Delegates raised the issue of whether it is fair for industry proponents to develop such detailed knowledge of local communities, when these may not have the opportunity and the means to analyse and anticipate nuclear industry or RW managers' behaviour. Such scrutiny of the community does not appear to be an optimal way of building waste management relationships. Should not such sociological methods be applied to analyse institutions that are supposed to own or solve the RW problem? Although every member of an affected community does make an informal assessment of proponents, Mr. Włodarczyk agreed that it is important for local stakeholders to have access to information on the role of each player.

Robert Zelmer, Director, Low-level Radioactive Waste Management Office, detailed the Property Value Protection (PVP) Program in the Port Hope Area. The PVP programme maintains desirable real estate market stability in the host community. It compensates owners of local residential,

commercial or industrial properties who suffer financial loss as a direct result of the Port Hope Initiative (diminished sale price or rental income, or difficulty renewing a mortgage). Municipalities will also receive compensation for lost tax revenue resulting from any diminished market value assessments. The PVP Program will function throughout the duration of the Initiative and into the first two years of long-term monitoring and surveillance of the planned waste management facilities (12 years expected in all). It concerns an area of approximately 90 km², comprising a total of 5 128 properties at an assessed value of \$586 million (Canadian) as of 2000. Claim assessments will draw on a real estate database including a neighbouring reference area.

More than 40 claims forms were given out over the first 12 months by the PVP office located in downtown Port Hope. The majority of the public who inquired about the PVP Program seemed satisfied to learn that compensation was available should they ever need it. Two claims have been submitted to date (one was partially validated and one rejected). The majority of claims are expected to occur once facility construction begins.

The **workshop round tables** then discussed Session I presentations. Delegates reflected that social concerns may be widely shared, but are always specific to a site and context. Community liaison groups were pointed to as valuable tools for uncovering social concerns and bringing them to the attention of authorities in a problem-solving setting. As not all members of the community may share the same concerns, consultations must seek out a range of voices, including accountable representation of the “silent majority”.

At the workshop, the outstanding local concerns involved: long term viability of the community, land uses, economic development, project timetables, corporate memory of the facility, long term responsibility and record keeping. Broader societal concerns, like health for future generations, may surface in national debate. Participants found that in contrast with local communities, who feel the need to solve a problem, national populations may be less motivated to join in debate over RWM solutions. Contacts with various groups in society, especially Aboriginal peoples, may need time to develop and bear fruit. Institutional frameworks therefore should foresee sufficient time and resources for collective learning about the need for management, the choices that are open, their potential impacts, and which criteria should be used to choose among options. In Canada, existing experience with large-scale consultation under Environmental Assessment legislation will form a valuable basis for meeting the challenges of consultation mandated by the *NFW Act*.

The round tables recognised that confidence in RWM is affected by the trust among partners. In situations – whether national or local – marked by a legacy of low trust, there may be a need to start over with new actors and partnerships. All must commit to listening to each other.

In the same way that institutions investigate attitudes and concerns in affected populations, society should investigate and discuss the values underlying decisions and behaviours in the central stakeholder organisations (e.g., regulators, implementers, NGOs, pressure groups and local decision makers).

Workshop Session II: How to address social concerns?

D. McFarlane, Director, Site Public Affairs, Ontario Power Generation, described the communities hosting some of Canada’s nuclear and coal-burning power plants, and outlined corporate-community relations objectives. These include building trust, garnering support for ongoing operations, and being – as well as being viewed as – a good corporate citizen. Meeting these objectives implies knowing and caring for the community and the issues raised by residents – not just

issues of interest to the company. Through case studies, Ms. McFarlane described efforts to reach out to the communities, by providing information, engaging in dialogue, and contributing resources and time to community priorities.

Specific projects or events offer the opportunity to improve corporate awareness of community needs and upgrade interactions. The Point Lepreau plant refurbishment was prepared by extensive employee and public consultation, open houses, and media relations. Stakeholder workshops have provided guidance on valued environmental features. A Community Liaison Group will be established and a newsletter will provide regular public information.

Managers at the Pickering plant became pro-active to combat their bad community image and bad press. They set up an early-warning mechanism to keep the municipality and citizens informed of any major or minor occurrences – including positive ones. In an innovative home-visiting programme plant workers – community members themselves – went to see their neighbours and offered to answer their questions. New arrivals in the community also receive an informative visit. One hundred and sixty issues of concern (including technical issues) have been identified and staff is working through them – some concrete changes have been made in plant operations.

Community relations staff recognise the difficulty of drawing out opinion and interest from the silent majority. They are exploring new channels for information exchange like web-based tools and visitors' centres.

B. Holton, of Holton Flowers, Port Hope, gave a personal account of growing from an “Eldorado kid” whose father worked at the local plant, to a small businessman concerned by the stigma attached nationally to his home place. Starting in 1976, nightly news reports of contaminated houses, schools and ravines transformed the sleepy tourist town into “the radioactive hotbed of the country”. Trust was destroyed by an apparent conflict of interest: the same government that operated the plant sent employees to reassure the population. Health risks were said to be negligible yet still a cancer study was conducted; extensive clean-up efforts sparked the question: “if it’s not a major health risk than why are they spending so much money cleaning it up?”. Homeowners faced authorizations before altering their property. One or two business prospects each month ceased inquiries when informed of the waste by the Town Hall.

Mr. Holton recalled the multi-phased process of resolving the waste issue. In particular, when the federal Siting Task Force was set up in 1988 to find a community within Ontario willing to host a storage facility, Port Hope formed a local Citizens Liaison Group (CLC) to examine potential solutions from a source community’s point of view. This group of volunteers restored local confidence, digesting information and representing the community at the table. Municipal elected officers worked actively to find and impose a “community-driven” solution, in tune with the local desire to “get on with it” and see economic development comparable to that in the neighbouring town. The issue was felt to represent a stigma problem more than a health problem.

Ten years later, after the failure of other siting efforts, the municipality came forward to volunteer a solution. The community was divided about where exactly to site a long-term management facility, and it was not easy to involve citizens (for instance, engineers discussed the issues in open houses but these were not very well attended). However, the municipal proposal came to be viewed by many as apt to solve the environmental problems plaguing Port Hope.

Renewed involvement of experienced and respected CLC members in the 1998-2001 negotiations increased confidence that residents’ concerns would be taken into account. Subsequent to

the 2001 signature of the formal agreement, public input and consultation will again play an important role during the environmental assessment in determining final outcomes.

L. Oates, Project Manager for the City of Toronto's Integrated Solid Waste Resource Management Process, commented on lessons learned in regard to the proposed siting of the Adams Mine Landfill in North East Ontario. He reviewed stakeholder concerns aroused by the proposal. Several Aboriginal First Nations have identified the Adams Mine within their land claims area. Local farmers as well as politicians feared potential ground water contamination. Groups felt recycling and composting should reduce landfill needs. Wilderness advocates saw a clash with the development of eco-tourism. Despite attention to these concerns in the project design, negative media coverage fuelled opposition to the proposal, creating North-South polarization across the Ontario province.

The Toronto experience points to ways to build confidence in a project proposal:

- long-term commitment by one or more governments;
- assessing the status quo ("do nothing") option;
- reviewing all components of an EA in a hearing;
- including a role for local interests in long-term monitoring;
- listening to the project opposition and encouraging co-operative problem solving;
- demonstrating sustainable development and project safety;
- funding third-party research and critical review;
- utilising mediation and other conflict resolution techniques;
- identifying a project spokesperson for the public and media;
- linking national goals to local concerns.

G. MacDonald, representing the Township of the North Shore and the Standing Environmental Committee (SEC) of the Serpent River Watershed, stated that she is a stakeholder living downstream from 175 million tonnes of acid-generating and radioactive uranium mine tailings. Public confidence in the Elliot Lake region is influenced by past mining issues: worker health concerns and difficulties in obtaining compensation; myriad observations of radium uptake; drinking water contamination issues and inequitable quality standards adverse to the Serpent River First Nation; loss of land use. Government failed to set aside funds for local monitoring of the decommissioned mining region, or to involve citizens in decisions as recommended by the Kirkwood Panel. These failures represent betrayals of trust and furthermore give public confidence little chance to improve.

In these circumstances, the affected community has given attention on their own to mid- and long-term issues. At issue is not the current funding or management of the waste storage sites, but rather, creating and maintaining local knowledge and competence to monitor their management over the coming decades and generations. Concerned members of the community note that the federal government "has done nothing long-lasting to ensure confidence" on this level. They highlight the importance of questions like: "Do I have the knowledge to act in my best interest?" and "Who can I trust to protect my interest?" – and have set out to answer them.

The Standing Environmental Committee has worked for one year to develop a pro-active approach to tailings management with emphasis on sustained public awareness and involvement, in

the goal of protecting human and environmental health over the long term. The following advice was offered to a community wishing to set up a similar monitoring group:

- Plan how to deal with the waste before it is produced.
- Make sure everyone fully understands important issues like financial assurances.
- Appreciate the integrity of individuals – no matter what their label says: staff, politicians, environmentalist, government bureaucrats, scientist or industry workers.
- Know why you're at the table, know who is paying (and who should be), and know what resources you have.
- Be prepared to commit significant personal time to the effort.

K. O'Hara, Associate Professor, School of Journalism and Communication, Carleton University, examined the negative associations with which the words “nuclear waste” are loaded.

She quoted research about the dimensions people may use when they informally assess risk: is the risk in question involuntary or voluntary? inequitably distributed? unfamiliar? poorly understood by science? threatening to children or to future generations? etc. Such evaluations influence the acceptability of perceived risk. Ms. O'Hara observed that scientists in dealing with the public have in the past not trusted the public to have valuable opinions about science and technology. Such an attitude may be related in part to the low science awareness and sophistication that some surveys have found in the general public. Nonetheless, other surveys show that people tend to trust scientists (and doctors, especially) and are interested in knowing more about science, especially when it relates to health.

Traditions in journalism and publishing sometimes lead to oversimplified stories or overdramatic portrayals of scientific controversy. The public can deal with controversial issues, Ms. O'Hara stated; one of their primary concerns may be to know whether an acceptable “Plan B” is in place to manage technology gone wrong.

The **workshop round tables** then discussed ways to address social concerns. Tools include information sharing and compensation programmes. However, the source of concern and underlying issues must first be brought to light in order to create proper response. The round tables viewed that in a good number of cases – inside or outside Canada – some social concerns stem from eroded trust in operating or managing institutions. A deficit of trust may arise from lack of familiarity, misinformation or missing information, changing sensibilities of society over time, specific past failures of particular institutions, or inadequate general education. In some cases media treatment of the issues may accentuate distrust. Building confidence will require committing substantial resources to: safety, monitoring, consultation and information exchange with affected communities, appropriate compensation, and effective long term institutional involvement with the project and with the community. Institutions must fulfil their commitments and honour legal agreements.

Among the suggestions generated by the round tables were:

- Those in authority must be accessible, and top management must meet with local communities regularly.
- Organizations must demonstrate long-term commitment to safety, and provide balanced information.

- Involved organizations should take responsibility for informing actively, and not let the sole media take over this job.
- Communities typically want to have independent counsel and build their own expertise, even if they accept that the government regulator provides a source of expertise independent from the proponent. Funding is thus needed for these purposes.
- A formal but flexible structure should bind the implementer and the community, allowing community leaders to participate in formulating and implementing solutions.
- Both local and national solutions should be explored on a stepwise basis with the public.

Discussion of the use of financial compensation led to the following observations: Economic solutions work for many of the social concerns identified, but safety is not to be bought. If they come too early in the process, discussions of economic arrangements may affect the credibility of assertions about safety, environmental and even economic impacts. A sound, accountable infrastructure should be set up under the control of a neutral party to administer funding and compensation. The target geographic region for compensation should not be drawn too narrowly, so as to ensure that neighbouring communities who may have legitimate rights are not excluded from consideration. The overall aim should be an enduring development plan for the host community that includes, but is not limited to, the RWM facility.

Workshop Session III: Development opportunities for communities

R. Austin, Mayor, Municipality of Port Hope, spoke of his interest to ensure that his hometown remains a thriving, friendly, and beautiful community. An environmental problem has been transformed into a development opportunity for Port Hope with lasting benefits for its citizens even beyond cleanup.

On signing the legal agreement with the Government of Canada, the three municipalities each received a \$10 million host community fee. In Port Hope's case these funds are earning interest, which the Council may use in the community. The principal will remain in trust until the regulators license the future facility.

The current planning stage has already brought new investment and expenditures (including office space, and business traveller lodging and meals). Once moving the half-a-million cubic metres of material actually begins, Port Hope will enjoy new employment and income. It is expected that \$250 million (Canadian) will be spent in the community. Land restoration, new roads and buildings, and technical support tasks will benefit local residents and business. These benefits are expected to outweigh the nuisances that cannot be mitigated by the proponent. Accommodating these works will require renewed infrastructure (e.g., new roads and access). Synergies between the Project and the municipal works agenda will be exploited.

In the long term, properties, including certain non-radioactive historic industrial sites, will be available for unrestricted foreseeable uses. Major spin-offs are expected, like waterfront development of the lakeshore. Like the land itself, local confidence is also restored by the image gained as a forward-looking community that solved its problem and built opportunity.

Mayor Austin recognised the need to bring local residents "on board", as they bring ideas to the process. He observed that federal players did not enjoy community trust a priori, making the active role of local elected officers that much more important in finding a solution acceptable to the local

public. Federal negotiators had to accept that they were working side by side with the local authorities to create the right solution. Compatible “chemistry” or the right individuals at the table were needed as well.

L. Kraemer, Chairperson, Canadian Association for Nuclear Host Communities (CANHC), and Mayor of Kincardine, the host community of the Bruce nuclear power station, brought forward some “grass roots ideals” of elected officials. The CANHC was recently created in recognition of the need for nuclear host communities to come together to engage not only the nuclear industry, but provincial and federal government as well, in a public dialogue. This association will champion host community needs as the new option-weighting process goes forward. It was a disappointment that the association did not receive a seat on the WMO board.

With the new *NFW Act*, geological disposal of spent fuel waste is no longer a foregone conclusion, and the communities woke up to the possibility that waste now cooling within the nuclear power station area may potentially remain there for a much longer term. Even if these wastes are one day transported away from reactor sites, long-term storage on site needs attention.

Mayor Kraemer views that a community not currently hosting a nuclear installation would volunteer to receive waste only on economic motives. Current host communities concentrate knowledge of nuclear operations and issues.

Mayor Kraemer then recounted his own constituents’ perceptions of the ongoing siting process for a low- and intermediate-level nuclear waste storage facility in Kincardine. He highlighted the importance of mutual co-operation between the nuclear industry and the municipality to “debunk public hysteria”, characterising “fear” as “False Expectations Appearing Real”. A Memorandum of Understanding has been developed between his municipal government and the local nuclear station, foreseeing elements of public education, safety and management methodology. In Mayor Kraemer’s view, making an active investment in waste management solutions at the local level can realise the economic aspirations of both the community and the nuclear sector.

L. Simpson, Mayor, Local Government District of Pinawa, Manitoba, described the impacts and public concerns produced by a hastily planned and executed withdrawal of the primary employer from a dependent company town. The Whiteshell Laboratories of the Crown corporation Atomic Energy of Canada Limited (AECL) were established in Eastern Manitoba in 1963, and Pinawa was created 15 kilometres away. Located in a provincial park region, Pinawa has also become a popular holiday cottage area with 20 000 residents inside a 30-minute radius. In 1995, the AECL Reactor Safety Research Program was moved to Chalk River, and the Nuclear Waste Management Program (NWMP) was left in limbo. Commercial negotiations to go on operating business on the site broke down. The town of Pinawa, the major stakeholder, was kept at arm’s length from all discussions.

The local Councils and the Province of Manitoba view that AECL should take responsibility and start decommissioning the site immediately. However, the current outlook is that AECL will be allowed to defer commissioning and the site will be left under monitoring and surveillance until such time as disposal facilities for the various types of radioactive materials are available in Canada. This poses problems, according to the municipality, of competence maintenance (“what competent person would want a job babysitting a dead facility?”) with the nearest active nuclear site distant by 2 000 km. Furthermore, this sole viable industrial site within Pinawa will be immobilized and non productive for 60 to 100 years. The municipality requires that it be freed up. Detailed submissions by Pinawa and eighteen neighbouring Municipal Councils to the regulating authorities have evoked no response. Aside from the safety implications (for example, a fire in the non-decommissioned nuclear

facility would be handled by unspecialised local firemen), the morality of expecting future generations to bear the high cost of decommissioning is seen as questionable.

“Our issue is not what industry is doing in our community, but what it’s *not* doing”. AECL and the federal government should facilitate the diversification of the local economy, and federal land should be released to the community. Pinawa suggests that the decommissioning of the Whiteshell Laboratories should be treated as a national demonstration project. AECL could construct a disposal facility for the resulting low-level waste (this facility could receive LLW from all of Western Canada, perhaps). High-level waste, currently on the site, should be dug up from surface burial, containerised and stored in canisters until the final disposal concept is identified.

Several communities in Northern Manitoba are in dire straits because of mine closures. Although a law prohibiting NFW disposal was passed in their province years ago, Mayor Simpson has indicated that elected officials in the depressed areas might possibly welcome an opportunity to host a repository. “When your entire town is decommissioned, this causes you to think.” Manitoban decision makers might be willing to deliberate and negotiate with persons outside the nuclear industry. Siting a repository in Northern Manitoba would provide a strong incentive for keeping the NWMP in Pinawa. Working out all these issues, Mayor Simpson concluded, will depend on co-operation amongst the stakeholders, AECL and the governments, and they all must be empowered to succeed.

A. Richards, a public relations specialist from Cogema Resources Inc., discussed the programmes for human resource and community development in northern Saskatchewan. This region has the world’s largest known high-grade deposits of uranium as well as a high level of provincial, public and northern community support. A mainly Aboriginal population of around 35 000 with a very high proportion of young persons entering the work force, lives in small, dispersed communities in a landscape of forest and lakes.

All of the uranium mines are in remote locations with “local impact” communities often several hundred kilometres away. In the late 1970s a public board of enquiry set mine operating conditions that included maximising opportunities for northern business and employment. Dozens of joint initiatives have since been developed and resulted in innovative hiring, training and transportation programmes, as well as support programmes to improve health, education, professional and business development and quality of life in the communities.

Residents of northern Saskatchewan, like all other Canadians, are not prepared to accept environmental risks in return for economic opportunities. Three regional Environmental Quality Committees, with representatives from all of the northern communities, work with Provincial agencies and the uranium mining industry to ensure community concerns are included in decisions. Northern hunters and fishermen, whose close links with the land are respected, provide relevant data to the Environmental Monitoring Program. Mutual trust is developed through constant interaction and dialogue in one-to-one relationships. Traditional activities like trapping are given their full importance. A Community Vitality Project jointly monitors social well being as defined by northern interests and culture. Compensations and company donations in some cases provide resources for community activities.

“Sustainable mining” means that diminishing mineral resources are offset by the creation of other economic opportunities. Successful northern-owned as well as joint-owned service industries have taken root. Creating a flexible and competent work force in the north is a multi-year process. Specialised academic and technical training is needed in order for greater numbers of northern people to join the mining management ranks. Cogema and the uranium industry have committed to these long-term goals.

M. Simard, University of Quebec at Chicoutimi, studied the social impacts arising from the Alcan industrial megacomplex in Alma (30 126 inhabitants). The Alma aluminium smelter began operation in 2001. It employs 865 people and has a production capacity of 407 000 MT of aluminium ingots. The three-part study, conducted during the smelter planning, construction and operation phases, tracks community perceptions and satisfaction with quality of life. Residents were found over time to be generally satisfied despite an increase in nuisance impacts during the construction phase.

Quality of life – a state of physical, psychological, and social well-being – is made up of environment, work, family and health dimensions. We may come to recognise that this concept is as important as that of sustainable development in assessing industrial projects. Perfect quality of life is perhaps never attainable but any project should give consideration to maintaining or enhancing life conditions. In this way, for instance, even short-lived construction-phase nuisances could be anticipated and mitigated.

Collecting data in the community about impacts on quality of life can help adapt projects and make policies responsive to the needs of residents. By ensuring the social acceptability of private and public action, impact assessment processes contribute to the well being of stakeholders and the general population. They also serve organizational goals of reducing conflict.

Mr. Simard discussed the importance of creating structures to monitor project evolution and to provide a link between the developer and stakeholders. Such local follow-up can also identify the quality of life indicators that were absent from original assessments, and provide guidance for future SIA.

The **workshop round tables** pointed to the EIA process as a valuable opportunity to bring decision making close to the community and involve the persons who are affected. It was recognised that equity is not achieved only by economic arrangements, but moreover by the ability of the community to influence the project.

Communities want to protect their employment, sustainability and quality of life, and they may be willing to make trade offs (to accept otherwise “undesirable” facilities) in order to preserve those factors. However, the round tables recognised that some things will not be traded away. These are: reasonable health, quality of life, safety and security. In the same vein, nothing can acceptably compensate for deliberate pollution or other negative environmental impacts, or for abandonment of a situation by an industrial organisation. If the important basics are assured (protection of health, safety and the environment), then most communities can become quite flexible and innovative in negotiating opportunities and trade offs. The round tables observed that open communication is needed for communities to be able to analyse the situation properly and make valid decisions about what they are getting and what they are willing to trade. This requires that the technical project proponents learn to communicate more freely and understandably.

Development packages often include jobs, business opportunities, training, environmental improvement, and decision-making and involvement guarantees for the communities. As potential host communities increase their own contact and exchange, development packages may become even more similar. Some discussants felt that all aspects of a given package should be developed through consultation and negotiated with the community, while others think that the process for negotiating the specifics can be a pre-set common denominator. Mechanisms are needed for reviewing and updating the package in light of events and community changes, but safeguards are needed as well so that funding institutions can plan their long term commitment rather than “sign a blank cheque”. To make a development solution stand up over time, participants suggested: transforming liabilities into benefits (a very-LLW facility could become a community recreation area); setting up penalties for

breach of commitment; securing formal parliamentary accords so that solutions will outlast the current political power balance; creating permanent community liaison groups with rotating membership; creating partnerships to last throughout the full life cycle of the project; and setting up financial reserves to guarantee project completion.

Delegates felt the partnerships set up in Port Hope had worked well. They viewed the enduring relationship and shared responsibility set up by the formal agreement to be more important than e.g., the financial benefits accrued to the community.

Overall, development opportunities were viewed not as creating trust, but as possibly contributing to confidence and trust. These are staked not on economic opportunity but on the guarantee of openness and listening and long term commitment by the industrial organisation or other proponents.

Session IV: Thematic reports

D. Bard M.D., Professor, National School of Public Health (Rennes, France) reflected that social acceptance of a radiological situation may depend on a demonstration that the public health impact is negligible. It is necessary to communicate the scientific bases of such an assessment to stakeholders who may not be familiar with scientific methods. This involves, in particular, communicating the margin of uncertainty associated with very small risks, whose impact by definition is extremely difficult to evaluate. Dr. Bard addressed these communication challenges by presenting the fundamental concepts underlying radiological risk assessment, as well as the types of data (including exposure data) that should be available to members of the concerned public to allow them to check claims.

J. Hetherington, Community, Economy and Environment Department of the Cumbria County Council (UK) recounted the unfolding of events after his area, a nuclear host region, was pre-selected in the 1990's to receive a national deep repository for intermediate-level waste. Concerns about process fairness, and about scientific confidence in regard to the Sellafield Rock Characterisation Facility, led to a stalemate. In the aftermath, nuclear waste policy itself is currently being redefined in the UK through a series of consultation processes. Dr. Hetherington identified two lessons from the Canadian experience that he wished to bring home. First, the west Cumbrian communities must be central to the debate in the UK – the bulk of the UK waste legacy is there – and agreed, long term, secure management must be jointly developed. Second, an effective and locally engaged Liabilities Management Authority must be ensured in the UK's forthcoming Act and be fully integrated with the overall approach to waste management.

P. Fleming, Ph.D., Senior Associate Dean and Associate Professor of Philosophy, Creighton University (USA), explored the ambiguity associated with Canada's requirement of an "ethical assessment" of nuclear waste management solutions. Such an assessment could target finding out what Canada "ought" to do (normative ethics), or, alternatively, could be used to determine simply if Canadians' current values are reflected or expressed in proposed solutions. Canadians need to determine which meaning is intended by that requirement. Prof. Fleming suggested that these two levels could each be addressed in a "stepwise ethics" process, as seen for example in Port Hope.

Prof. Fleming observed that the FSC was engaged in an ethical deliberation on the role of stakeholders by asking questions like: what should be the role of stakeholders in RWM? On which ethical principles does stakeholder involvement rest? Are there competing ethical principles? She encouraged delegates to reflect in ethical terms on four ideas: 1) seeking stakeholder confidence may

be aligned with political expediency rather than with ethical duty; 2) interest in process reflects an interest in ethical *means*; in ethics, as in policy, the focus is on observable means *and ends* (never on intention); 3) beliefs about the moral significance of different entities guide the desire to ensure that all “relevant” interests are accounted for; and 4) differences among nations need not conflict with the world-wide interest in finding a common moral wisdom regarding best ethical practices in nuclear waste management. She suggested that those involved in RWM should amplify their search for “best practice” with reflection on “ethically preferable” means.

M. O’Connor, Professor of Economics, C3ED, Université de Versailles-St. Quentin en Yvelines (France), constructed three observations about components needed in RWM process from the Port Hope case study and site visit. 1) There is a “scientific side of the story” – i.e., the need to measure and manage the radioactive dose that could be received now or in the future by exposed populations. 2) There is a social dimension – concerned with building relationships with the wastes that will allow relevant communities to interact with the sites and what is stored there. 3) There is a need to build political and economic partnerships that can effectively implement agreed solutions.

Prof. O’Connor pointed out that in Port Hope, the solution found for handling the legacy wastes grew out of the relationship that the community was *willing* to establish with those wastes. He argued that long-term RWM will depend on establishing many such relationships between communities and waste. Waste management strategies may differ considerably as regards the relationships (in social, economic, cultural and symbolic terms) that they establish between the people – individuals, classes, interest groups, succeeding generations, whole nations – implicated in the situations of production, storage and monitoring of the wastes. Choosing solutions will imply examining which relationships are wanted.

Prof. O’Connor also noted that part of the “community side of the story” was resentment that for forty years, experts had omitted to form partnerships to choose and implement solutions. Only deliberate policies to maintain social structures giving meaning to waste management, he warned, will ensure that the scientific and technical side will continue to receive funding.

Concluding remarks and participant reactions

P. Brown of NRCan confessed that when starting to plan for the workshop, his organisation had felt some trepidation in exposing policy-in-progress to open scrutiny. As planning progressed, however, all came to feel that the workshop was exactly what was needed. It contributed to building relations among Canadian stakeholder communities at the outset of the new phase in Canada’s RWM programme. Feedback on the Canadian context was gained along with thoughtful insight generated by interactions among the diverse group of participants. Mr. Brown was confident that the experience would reinforce the fabric of the Canadian programme.

C. Pescatore of the NEA recalled the FSC mandate to provide member countries opportunities to learn from one another, to come to a shared understanding of commonalities and differences and, ultimately, to grow together. The range of presentations and the rich discussions contributed to those goals. The workshop was an efficient learning process: along with the interesting Port Hope story, the whole national programme was showcased. In a few days, delegates came to see the size and shape of the problems, the actors at play, the solutions brought to bear, and the major issues. He agreed with feedback from a rapporteur that the international workshop was a context for building shared moral wisdom about how society should manage radioactive waste. Mr. Pescatore expressed the participants’ satisfaction in witnessing a defining moment in Canada’s search for long-term solutions for radioactive waste management.

FSC members and first-time participants found the workshop to be “useful” and “valuable” with a very “high quality of presentations”. It brought together Canadian stakeholders from across contexts and from across the huge territory – some of whom knew each other well, and others who otherwise may never have met. Participants “thoroughly enjoyed meeting international delegates with whom we all share a common bond” and “sharing ideas around our table”. The next workshop is looked forward to as a new opportunity to reinforce “the progress we are collectively making”.

INTERNATIONAL PERSPECTIVE

NEA Secretariat

The workshop dealt with two distinct cases:

- In Port Hope – an existing situation impacting a set of communities affected by the nuclear fuel industry since the 1930s. This situation concerns the remediation of soil “tainted” by a low level of radioactivity resulting from the processing of uranium. The facility that produced those wastes is still in town but it has changed ownership and it no longer stores or disposes of the waste in the area.
- The issuance and upcoming implementation of the *Nuclear Fuel Waste Act (NWF Act)* charting a path towards the identification of a national, long-term management solution for nuclear fuel (high level) waste in Canada. The *NWF Act* restarts a process that was interrupted a few years ago, after the Seaborn Environmental Assessment Panel concluded that the solution proposed by proponent Atomic Energy Canada Ltd. had not been demonstrated to have broad public support.

From an international perspective, numerous observations can be made and lessons can be drawn both from the individual and the combined cases. Some of the most prominent observations, in the view of the NEA Secretariat, are presented hereafter.

Driving the process requires both determination and framework

The Port Hope case study gave insight into a highly successful process of solving the low-level waste issue affecting local communities. A coherent, community-driven approach gradually emerged out of a twenty-year history. Municipalities came to the realisation that they had to take the waste problem into hand, and reached out to form a collaborative dialogue with the federal government. Strong municipal leadership set up processes to identify preferred technical solutions, and negotiated accompanying measures that satisfied the communities. Outstanding aspects of this experience include:

- the engagement by local players to solve their problem;
- the determination of local and federal players to come to a mutually agreed resolution;
- the attention given to developing a comprehensive solution (including both technical features and property value protection or development features);
- the willingness to take the time needed to discuss and learn.

This case study demonstrates that siting and management solutions can be worked out in partnership and that affected communities can elaborate desired options. The determination of the

local and federal players and drivers of the process emerge as paramount to the success of the initiative. The process, however, could not have developed if effective *frameworks* for decision making had not been constructed. Among the first framework elements structuring the Port Hope dialogue was the Government's decision to follow a Cooperative Siting Process recommended in 1987. Key in this process were the respect for the host communities' interests, the Government's willingness to accept the community-driven process, and the right given to the municipalities to decide eventually not to proceed with the project if they judge that their concerns cannot be alleviated. The second framework resulted from the ensuing dialogue among the local and federal partners; a formal Legal Agreement was signed that established the terms under which the project, the Port Hope Area initiative, would proceed. Finally, the EIA framework will provide structure for the further evolution of the conceptual technical approaches defined in the Legal Agreement.

Thus, driving any process requires both determination and a framework within which organisations and individuals know their roles and through which commitments can be taken. Additionally, a wider finding is confirmed: community veto power, even informal, helps win local players to the dialogue.

Risk and safety are evaluated at several levels

The Port Hope community has been living with nuclear industry activities since the 30s. "Tainted soil" was not identified, nor seen as a potential health problem, until the 1970s.

After the more dangerous residues were removed from the community, the latter, through discussion, has come to see the residual waste as posing few health risks, and health and safety have receded as primary concerns. Concerns rose however to a more important level regarding impacts on the economic viability of the town. Stigma arose from more distant communities' perception (largely amplified by the media) that Port Hope was an unhealthy living environment. Ultimately, the proposed solution developed in Port Hope is meant to improve the image of the community and remove the stigma, while preserving safety. The community's conceptual solution rests on building a readily accessible and monitored surface facility.

The Secretariat observes that assessments of risk can be very dynamic in time, location and factors of influence. More than the actual radiological risk comes into consideration. In particular, feelings of being in control of the waste and of being active in formulating the solution each seemed to play an important role in allaying risk in the Port Hope community.

One important issue in any national solution is the long-term sustainability of active control. The Environmental Impact Assessment (EIA) can be a critical platform for discussing and addressing the conflicting aspirations of active control and long-term passive safety, as seen already in e.g., Finland.

Develop solutions that make communities grow

The Port Hope Agreement provides for growth on a number of levels: the physical activities leading to new management facilities bring infrastructure benefits and reinforce the local service economy. The form chosen for the facility will allow attractive leisure activities to be developed for residents and for a significant regional market. A host fee, placed in trust until such time as the facility will be licensed, was provided in recognition of the communities' service to the nation and to mitigate any future impacts resulting from the clean-up programme. This fee will cushion the long-term

municipal economy, and the interest earned today on the principal provides available moneys for community development.

In all urban development situations it is necessary to find a management solution that not only reduces unwanted impacts but also lets the community grow as it sees fit. It is now an important acquired principle in radioactive waste management world-wide to accompany siting efforts with cogent local and regional development schemes taking into account the views of the affected communities. The AkEnd siting process recommendations in Germany, and the siting programme undertaken by NUMO in Japan, are two strong examples seen in 2002.

Special role of the nuclear host communities

Nuclear host communities – where the waste is stored already in a semi-permanent way or where waste is being produced – tend to be the communities most interested in having a permanent, safe solution brought to bear. They have also a level of familiarity with industry, knowledge of the dangers and control of radioactivity, as well as an interest for continued partnership with industry and government with a view to long-term community development. A dialogue can develop more easily with these communities than with non-nuclear communities, and experience worldwide shows that it is with nuclear host communities that progress in facility siting has been made quickest. This trend is also confirmed in Canada as shown by the Port Hope Initiative and as suggested by the positive attitude to dialogue expressed by the President of the Canadian Association of Nuclear Host Communities (CANHC).

At the same time, the recent founding of the CANHC provides confirmation that nuclear host communities are starting to federate with one another thereby becoming even more important and more knowledgeable players. This trend is clearly visible in Europe through the activities of the association of European nuclear host communities (GMF).

A combined technical and societal focus

The Canadian nuclear fuel waste policy embodied in the *NFW Act* represents a combined technical and societal focus on both process and outcome. This combined focus is also visible in the dealing with the Port Hope waste issue. Overall these examples are in line with world trends towards putting greater effort into integrating societal considerations that influence public confidence in RWM activities.

The Secretariat observes that succeeding in a risk governance endeavour of such magnitude implies a strong capacity for broad public information and involvement. That represents a challenge in every national context. Advances are being made in many countries through, *inter alia*, initiatives under the umbrella of EIA requirements.

BACKGROUND SESSION

The Canadian Context

*Chair: T. Seppälä
Posiva Oy, Finland*

THE NUCLEAR FUEL CYCLE, RADIOACTIVE WASTE AND CANADIAN POLICY

P. Brown

Director, Uranium and Radioactive Waste Division, Natural Resources Canada

Context

Nuclear energy is an important part of Canada's diversified energy mix. The nuclear fuel cycle in Canada includes the mining and milling of uranium, the fabrication of fuel elements, the use of that fuel in nuclear power plants, and the safe management of the radioactive waste by-products. The development and control of the nuclear energy option falls within federal jurisdiction and the Government of Canada wants to ensure that the public has confidence that operations at each step of the nuclear fuel cycle are carried out in the best interest of Canadians.

The nuclear fuel cycle in Canada

Canada is rich in uranium deposits mainly in the northern part of the province of Saskatchewan. Uranium mined in Canada is used as fuel for nuclear reactors around the world, including the CANDU (CANada Deuterium Uranium) reactor. Canada is the world's leading producer of uranium accounting for roughly one-third of total global output, generated \$500 million in revenues in 1998, and provided employment for over 1 000 Canadians.

There are 22 CANDU reactors in Canada located in Ontario (20), New Brunswick (1) and Quebec (1). Canada also has a successful CANDU export industry led by Atomic Energy of Canada Limited, a federal crown corporation. The nuclear industry contributes to the Canadian economy by generating thousands of jobs in the uranium industry, in the three provincial nuclear utilities and in approximately 150 Canadian manufacturing, supply and services companies.

Like any other industry, nuclear fuel cycle operations produce some waste, and more characteristically, radioactive waste. Concerns about radioactive waste increased sharply during the 1970s, as did awareness of the environment of nuclear safety issues, and of the hazards of radiation in particular. In the growth period of the 1950s and 1960s, the Government felt that the management of radioactive wastes was not a major problem, and that research efforts should be devoted to more basic or more pressing tasks. In the 1970s and 1980s, the Government recognised that the management of these wastes to currently acceptable standards would involve complex scientific and engineering preparation, and extensive public review processes.

The Government also realised that past methods of dealing with radioactive wastes had not been adequate in some cases by current environmental standards. Work was needed to resolve historic waste situations and to ensure that future wastes would be adequately looked after during their hazardous lifetime. It was also necessary to assign responsibility for both past and future wastes, so that requirements could be established, preparations made and funding set aside.

In general, federal policy is now to manage these wastes so that the health of people and the environment is protected, as well as so those who benefit from the wastes bear the costs of long-term management. The owners are responsible for establishing, funding and carrying out acceptable waste management plans. However, where no owner can be identified, or held responsible, the federal government recognises its residual responsibility.

Although Canada's radioactive wastes are currently in safe storage, steps are now underway to develop more permanent long-term solutions for all types of radioactive waste.

Progress on long-term radioactive waste management

Uranium mine and mill tailings

Uranium mine and mill tailings are large in volume, like other mine tailings. They are much lower in radioactivity than nuclear fuel waste, but higher than most natural materials. Canada has about 200 million tonnes of uranium mine and mill tailings. Because of their bulk, an in-situ long-term solution is generally required.

A number of uranium mines were closed out in the early 1960s in Ontario, Saskatchewan and the Northwest Territories without long-term decommissioning plans. The onus is now placed on current owners of the sites. In the event that owners cannot be identified or found, or are unable to fund or carry out the decommissioning of their sites, governments must accept the residual responsibility for longer term management.

With this responsibility in mind, a Canada-Ontario Memorandum of Agreement was signed in 1996 which provided that the federal and provincial government would split decommissioning costs 50/50, while allocating the longer term costs on a basis that both considered fair. It now looks as if almost all the tailing sites in Ontario will be decommissioned by their owners, so that the agreement may never be invoked. But it is there if needed. A smaller historic mine tailings issue exists in Saskatchewan at the historic Gunnar and Lorado uranium mine sites. Provincial officials are examining the appropriate actions to ensure that these sites do not pose any undue long-term risks.

Looking into the future, the *Nuclear Safety and Control Act* which requires that licensees provide financial assurances, it is expected that the proper eventual decommissioning of all uranium mines will be fully funded by their owners.

Low-level radioactive waste

Low-level radioactive waste covers wastes from reactor operations (other than nuclear fuel waste), uranium refineries, fuel fabrication plants, and hospitals and laboratories that use radioisotopes or other nuclear techniques. Low-level radioactive waste are categorized in Canada as being either historic wastes, for which the Government of Canada has accepted responsibility to manage, or ongoing wastes, that are produced as a result of current nuclear energy operations.

The total volume of Canadian low-level radioactive waste amounts to roughly 2 million cubic metres, the majority of which are historic wastes. The bulk of Canada's historic wastes are located in the Port Hope area of southern Ontario and resulted from the refining of pitchblende ore to obtain radium and then uranium during the 1930s through to the 1980s. Other small volumes of

historic wastes are located in discrete locations across Canada. These wastes are managed for the Government of Canada by the Low-Level Radioactive Waste Management Office (LLRWMO).

Ongoing low-level waste production in Canada amounts to a few thousand cubic metres per year. The larger producers, the nuclear utilities and AECL, manage their wastes at their own facilities. Small producers, such as hospitals and universities, typically send their wastes to the AECL Chalk River Laboratories for storage.

The Port Hope Area Waste

As mentioned above, a key issue for Canada in relation to the management of low-level radioactive wastes relates to its historic waste obligations in the Port Hope area. This longstanding environmental problem involved determining a long-term management approach for roughly 1.5 million cubic metres of radioactive waste and contaminated soils.

A Siting Task Force established in 1988 to find a site, using a voluntary cooperative approach, reported in 1995 with a potential host community located outside and north of the Port Hope area, i.e., Deep River located beside AECL's Chalk River Laboratories. In the end, negotiations with this community failed. Those negotiations were followed in 1998 with discussions between the Government of Canada and the municipalities in which the wastes are currently located. These discussions were community driven. The communities came to the federal government with proposals to manage the wastes locally for the long-term. The Government facilitated the development of the communities' proposals, all the while leaving the direction and decision making relating to the proposals to the communities themselves. Once the community proposals were submitted formally to the Government, they were reviewed and accepted as potentially forming the basis of a legal agreement that would define how the cleanup would proceed. The legal agreement was negotiated and signed in 1999 by the municipalities and the Government of Canada, and is now being implemented.

Key to our success, to date, in this process has been our respect for the host communities' interests, the Government's willingness to accept the community-driven process, and the informal right given to the municipalities to decide eventually not to proceed with the project if they judge that their concerns cannot be alleviated.

These commitments are made with a view to building a cooperative spirit for the Initiative and building confidence not only between the parties themselves, but broad public confidence in the final solution.

Nuclear fuel waste

Nuclear fuel waste is the irradiated fuel taken out of nuclear reactors at the end of their useful life. Canada has no plans to reprocess and recycle this fuel, so current plans are based on direct long-term management of the used fuel.

Nuclear fuel waste in Canada is currently in safe storage at the reactor sites, where it can be kept for at least several decades, in pools or in dry concrete canisters. The amount of waste is small in volume. Canada's entire nuclear power program produces less than 2 000 tonnes of nuclear fuel waste annually.

Nuclear fuel waste is highly radioactive when it leaves the reactor. The level of radioactivity decreases fairly quickly. After a few thousand years the radioactivity of the nuclear fuel waste would be similar to that of a uranium ore deposit.

In the 1970s, the increasing production of nuclear fuel waste from Ontario Hydro's CANDU reactors, and the enhanced concern about environmental issues, raised the issue of the eventual disposal of the nuclear fuel waste. The idea that there was no solution for disposing of nuclear fuel wastes captured public attention and the level of public concern increased. Progress toward a longer term solution was needed.

A deep geological disposal concept was developed by AECL and Ontario Hydro, and, in October 1988, it was referred for review by a federal independent environmental assessment panel. Guidelines for the required Environmental Impact Statement (EIS) were published in 1992, and the EIS was submitted by AECL in 1994. The Seaborn Panel, named after its Chairman, released its report with conclusions and recommendations on the acceptability of the concept in March 1998. The concept was found to be acceptable technically for a conceptual stage of development but not socially, and Panel proposed next steps to remedy the situation. With the Panel's recommendations in mind, and with further consultations with stakeholders, including the public, the Government of Canada developed the Nuclear Fuel Waste Act which received Royal Assent in June 2002.

The government of Canada radioactive waste policy framework

By the mid-1990s, progress was thus underway on a range of initiatives leading towards more permanent solutions for the long-term management of Canada's radioactive wastes. Most of these involved public or governmental processes which tended to take a long time. While there was progress on cleaning up some sites and putting the wastes in storage, there was not much actual progress toward permanent solutions. In a number of cases, it was still not clear who would actually pay for and carry out long-term management of radioactive waste and how the needed institutional structures would be organised.

Anticipating the conclusion of the various processes, and the need to move ahead with long-term solutions, the Auditor General of Canada in May 1995 concluded that Canada should get on with the implementation of long-term radioactive waste management, and ensure that appropriate funding arrangements are put into place. It noted that Natural Resources Canada (NRCan) should also reach an agreement with major stakeholders on their respective roles and responsibilities.

NRCan embarked on a series of discussions with the major stakeholders, notably the owners and producers of the wastes and the concerned federal and provincial departments and agencies. Some basic principles for radioactive waste management, and some proposed assignments of responsibility, both developed by the IAEA were part of the basis for discussion. There was general agreement on the principles and on the roles and responsibilities, although organisational and financial details remain to be worked out.

In 1996, the Government of Canada developed a Radioactive Waste Policy Framework clearly indicating that the federal government will ensure safe, environmentally sound, comprehensive, cost-effective and integrated waste disposal; that it will develop policy, regulate and oversee the waste owners to ensure compliance with legal and financial requirement in accordance with approved disposal plans; and that the waste owners are responsible for the funding, organisation, management and operation of disposal facilities.

The Policy Framework was therefore in keeping with Canada's traditional nuclear regulatory practice in putting the onus of safe operations on the licensees or owners.

Conclusion

Since the mid-1970s, processes for developing long-term radioactive waste management solutions have been lengthy and met with public resistance. However, more recently, progress has been made as a result of incorporating public processes and with the knowledge that public confidence is required in order to proceed. Canada has now embarked on a path which promises progress towards the implementation of long-term management solutions for all the types of radioactive waste resulting from the nuclear fuel cycle. Increasing and maintaining public confidence is an essential element in this progress and we will continue to seek ways to achieve this democratic goal.

REGULATING NUCLEAR WASTE IN CANADA

R. Ferch

Director, Wastes and Geosciences Division, Canadian Nuclear Safety Commission

The nuclear industry in Canada comprises a broad range of activities, including uranium mining and milling, uranium refining and fuel fabrication, nuclear power reactors, nuclear research facilities, isotope production facilities, medical and industrial uses of radioactivity, and management of the radioactive wastes resulting from these activities. A single regulatory body, the Canadian Nuclear Safety Commission (CNSC), regulates these activities throughout their entire life cycles from site preparation to decommissioning. The only exception to this broad span of regulatory control is the regulation of hazards from naturally occurring radioactive materials other than those associated with the nuclear industry. The regulation of such hazards is a provincial rather than a federal responsibility in Canada.

The CNSC's authority is based on the Nuclear Safety and Control Act (NSC Act), which was passed by Parliament in 1997 and, together with the regulations issued under the Act, came into effect in May 2000, replacing earlier legislation which had been adopted in 1946. As set out in the legislation, the CNSC's mission is to regulate the use of nuclear energy and nuclear materials to protect health, safety, security and the environment and to respect Canada's international commitments on the peaceful use of nuclear energy. In addition to the regulation of nuclear energy and materials and the implementation of international commitments, the CNSC's legislated mandate also includes the dissemination of scientific, technical and regulatory information on CNSC activities and on the effects of regulated activities on the environment and on the health and safety of persons.

The CNSC exercises its regulatory control through a system of licensing. With exceptions described in regulations, such as the possession of quantities of nuclear material less than a prescribed Exemption Quantity, all activities relating to the production, possession, use and disposal of nuclear materials can only be done under the control of a licence from the CNSC. Similarly, a licence is required to prepare a site for, construct, operate or decommission a nuclear facility. These licences contain conditions which describe the particular limits and procedures applicable to the activities permitted under the licence.

The fundamental regulatory philosophy of the CNSC is based on two principles, namely: (i) that those persons subject to the CNSC's regulatory control are themselves directly responsible for ensuring that health, safety, security, and the environment are protected and that international commitments are respected; and (ii) that the CNSC is responsible to the Canadian public for regulating the nuclear industry in order to assure that licensees are properly discharging these obligations. In keeping with this philosophy, the regulations under the NSC Act are predominantly performance-based rather than prescriptive.

Under the NSC Act and regulations, the Commission is required to hold public hearings on licensing decisions for nuclear facilities, and to provide opportunities to the public to intervene in

those hearings. In addition, a key strategic objective of the CNSC is openness and transparency. Therefore the CNSC has paid considerable attention in recent years to public consultation programs, to public participation in the decision-making process, and to making information on the process as freely available as possible.

The Canadian Nuclear Safety Commission itself is an independent quasi-judicial tribunal (the Commission), whose seven members are appointed for five-year terms by the Government. The primary role of the Commission is to deliver decisions on licence applications brought before them in public hearings. The Commission is supported by a full-time staff of over 400 persons, whose responsibilities include preparation of licensing recommendations to be brought before the Commission, development of regulatory standards and guidance documents, and inspection and verification that licensees operate in compliance with the NSC Act, regulations and licence conditions. In addition, the power to issue licences for many of the activities regulated by the CNSC, including radioisotope and device licences and licences for small facilities such as medical accelerators, has been delegated by the Commission to designated staff members.

Possession and management of radioactive waste in Canada is subject to exactly the same regulations and requirements as possession and management of any radioactive substance. There are general regulations that specify such items as radiation protection requirements applicable to all regulated activities, but there are no technical regulations specifically for waste management. Instead, the requirements specific to the permitted activity, such as waste management, are contained in licence conditions. These conditions in turn are typically based on documents submitted by the proponent and approved by CNSC staff.

Similarly, the regulatory requirements for a waste management facility licence are the same as those for other nuclear facilities, differing only at the level of facility-specific conditions in the licence. The information required of nuclear facility licensees includes the proponent's radiation protection program, environmental protection and monitoring program, waste acceptance criteria, operational program documents, public information program, and conceptual decommissioning plans and financial guarantees for the costs of decommissioning.

Waste facility licences can be broadly separated into two classes. At one end of the spectrum are small facilities at which waste from radioisotope users is collected and processed for forwarding to a long-term management facility. Such facilities are regulated, generally speaking, in the same way and following the same licensing processes as medical and industrial radioisotope users. At the other end of the spectrum are facilities for the management of wastes from nuclear power stations and large research facilities, which are regulated following processes similar to those used for large nuclear facilities such as power reactors. In intermediate cases of management of very large volumes of low-level waste, such as mine tailings and contaminated lands, the general practice has been to follow the same licensing processes as for large nuclear facilities, in recognition of the level of public interest that these facilities usually attract. The process for licensing large nuclear facilities includes substantial opportunities for public participation.

The first step in the process of licensing a nuclear facility is usually an environmental assessment. Under the Canadian Environmental Assessment Act, a government agency such as the CNSC is not permitted to exercise its decision-making powers with respect to a project until it has first been determined whether the proposed project, taking into account prevention and mitigation measures, will have adverse effects on the environment, including social and economic aspects. The processes for making this determination are set out in the Canadian Environmental Assessment Act. There are several processes possible, depending on the nature and size of the project and on the degree of public interest. Public consultation is a key feature of these processes, and may range from written

comments on reports to public hearings by the Commission, and in some cases to hearings by a separately appointed environmental review panel. Depending on the type of project under consideration, the actual determination may be made by CNSC staff, by the Commission, or in some cases by the Minister of the Environment.

Once it has been determined that there will not be significant adverse environmental effects, the Commission may then proceed to its licensing decision-making. For nuclear facilities, this generally involves a public hearing, which takes place on two dates separated by roughly sixty days. On the first day, the proponent presents a case to support its application, and the CNSC staff presents its recommendations on the application. The Commission poses questions to both parties, which may be answered at the time or in supplementary presentations on the second day. The second day also presents an opportunity for interested parties to intervene in the process. Full transcripts of the hearings are published on the CNSC web site within a few days of the hearing date, thus providing interveners with the opportunity to review the application and the staff recommendations. Following the second day of the hearing, the Commission deliberates and reaches its decision, which is recorded in a formal document published by the CNSC.

This process presents ample opportunities for interested parties to participate, but nevertheless has not escaped criticism. There is no intervener funding, except in the special case of an environmental review panel. The Commission's hearings are only occasionally held outside Ottawa. Despite these shortcomings, the CNSC has succeeded in attracting considerable public participation in the process of licensing waste management and other nuclear facilities. This participation has on the whole contributed positively to the credibility of nuclear regulation in Canada. A credible regulatory process is, of course, a key element in public acceptance of the industry and its activities, including those activities related to the management of radioactive wastes.

THE NUCLEAR FUEL WASTE ACT: CONTEXT, PUBLIC CONFIDENCE, SOCIAL CONSIDERATIONS

C. Létourneau

Senior Policy Advisor, Uranium and Radioactive Waste Division, Natural Resources Canada

Context

Like any energy source, nuclear energy generates some waste, in this case mostly low-level radioactive waste and nuclear fuel waste. In Canada, nuclear fuel waste refers to the irradiated fuel bundles that come out of domestic nuclear reactors and includes those bundles discharged from twenty-two Canadian CANDU reactors. Twenty of these reactors are owned by Ontario Power Generation Inc (OPG), and the other two are owned by Hydro-Québec and New Brunswick Power. Atomic Energy of Canada Limited (AECL), a federal Crown corporation, produces a small amount of such waste from its prototype and research reactors. OPG produces about 90% of the total amount of waste, the other two nuclear utilities about 8%, and AECL 2%. Other waste owners, e.g., universities, produce a much smaller quantity of nuclear fuel waste. About 1 million bundles of nuclear fuel waste are currently stored at nuclear reactor sites in Canada; 60 000 bundles are expected to be produced annually.

A cornerstone of Canada's approach to addressing radioactive waste management issues is the Government of Canada's 1996 Policy Framework for Radioactive Waste, which has set general policy for dealing with all radioactive waste from the nuclear fuel cycle (nuclear fuel waste, low-level radioactive waste, and uranium mine and mill waste). The Policy Framework defines the respective roles of the Government and waste owners. It also sets the stage for developing institutional and financial arrangements to implement long-term waste management solutions in a safe, environmentally sound, comprehensive, cost-effective, and integrated manner. The challenge is to ensure that the public is confident that the Policy Framework is being carried out in the best interest of Canadians. Part of the answer to this challenge was the development of the *Nuclear Fuel Waste Act* which entered into force on November 15, 2002.

The Nuclear Fuel Waste Act (NFW Act)

The *NFW Act* is a stand-alone piece of legislation with some 30 articles and without regulations. The Act deals essentially with financial and socio-economic considerations of the long-term management of nuclear fuel waste. It complements the health, environment, safety and security requirements under the *Nuclear Safety and Control Act (NSC)*. It provides the legal framework for:

- nuclear energy corporations to set up a waste management organisation (WMO) as a separate legal entity to manage the full range of long-term waste management activities;

- nuclear energy corporations to establish trust funds with an independent third party trust; a company to finance long-term waste management responsibilities;
- the WMO to submit long-term waste management options to Government; and
- the Governor in Council to select a long-term management option from those proposed by the WMO.

Specific requirements of the *NFW Act* can be sorted into four groupings, i.e., requirements dealing with:

- The waste management organisation (WMO)
 - WMO is established by “nuclear energy corporations”.
 - WMO proposes approaches to the Government of Canada.
 - WMO implements the approach chosen by Government.
 - WMO has a duty to offer nuclear fuel waste long-term management services.
 - WMO must establish an Advisory Council reflecting a broad range of expertise and representation.
- Financing
 - Nuclear energy corporations and AECL shall establish a trust fund.
 - Nuclear energy corporations and AECL are to make annual deposits.
 - Withdrawals are allowed only for implementing the government-approved approach.
 - The initial withdrawal occurs when a licence pursuant to the *NSC Act* is granted.
- Reporting and approvals
 - The WMO options Study is to be submitted to Minister within 3 years.
 - Specific components to be included in the Study are listed.
 - The WMO is required to carry out public consultations on an ongoing basis.
 - The WMO must regularly submit progress reports (annually and triennially).
 - Specific approvals must be obtained from the Minister and the Governor in Council.
- Compliance
 - Records and books must to be kept for 6 years.
 - Audited accounts of the WMO and of the trust funds must be supplied to the Minister.
 - Verification and auditing requirements.

- Offences are clearly identified.
- Penalty for an offence – a specific fine scheme is described.

The federal Minister of Natural Resources is designated under the *NFW Act* as the minister responsible for its administration. A group within the department of Natural Resources, the Nuclear Fuel Waste Bureau, is charged with ensuring that ministerial responsibilities are carried out appropriately. The *NFW Act* and other information related to the long-term management of nuclear fuel waste can be found on the Bureau's web site at www.nfwbureau.gc.ca.

Public confidence

In March 1998 a federal independent panel completed a ten-year environmental assessment and public review of AECL's concept of disposing nuclear fuel waste bundles at a depth of 500 to 1 000 metres in the stable rock of the Canadian Shield. Specifically, the Seaborn Panel, so named after its chairman, concluded that:

“From a technical perspective, SAFETY of the AECL concept has been on balance adequately demonstrated for a conceptual stage of development, but from a SOCIAL PERSPECTIVE, it is not.

“As it stands, the AECL concept for deep geological disposal has not been DEMONSTRATED to have BROAD public SUPPORT. The concept in its current form does not have the REQUIRED level of ACCEPTABILITY to be adopted as Canada's approach for managing nuclear fuel waste” (*added emphasis*).

This conclusion led to several questions: what did the Panel mean by “demonstrated”, “broad”, “support” and “required level of acceptability”? In particular, the last expression led to other questions: what is acceptable? Acceptable to whom? How to demonstrate acceptability? This led, in turn, to a goal of “increasing public confidence”, particularly in the following areas of radioactive waste management:

- technical safety;
- financial aspects; and
- social considerations (institutional structures - re. waste management organisation, federal oversight - social concerns and interests, ethical issues, public participation).

The public must first have confidence that waste management activities are carried out safely. To ensure this, the public must place some trust in the nuclear regulator and must have some level of understanding and sense of control. In this regard, the NEA has just published a report “Establishing and Communicating Confidence in the Safety of Deep Geological Disposal” which outlines various approaches and arguments. With respect to confidence that enough funds are available from the waste owners, in Canada the matter appears to be resolved by demonstrating to the public that indeed funds have been set aside securely, cannot be used for any other purpose, and are overseen by federal legislation. The rest of the presentation will focus on social considerations, which is the theme of this workshop.

Social considerations

Institutional structures: The waste management organisation

In its December 1998 response, the Government of Canada generally agreed with the large majority of the Seaborn Panel's recommendations. The Government, however, did not adopt the Panel's recommendation that an "independent" organisation be created "at arm's length" from the nuclear industry to carry out future waste management activities. Consistent with the 1996 Policy Framework for Radioactive Waste, the Government placed the greater responsibility on the owners who first profit from the operation of the nuclear reactors, and who have first-hand knowledge of how to manage their waste effectively. The Government made it clear that it expected waste owners to establish, organise, and manage a waste management organisation with a separate legal entity, over which it would exercise appropriate oversight.

Under the *NFW Act*, waste owners will establish a WMO, incorporated as a separate legal entity, with a mandate to manage and co-ordinate the full range of activities relating to the long-term management of nuclear fuel waste. The WMO will:

- within three years of coming into force of the Act, submit a Study to the Government which includes:
 - practicable long-term management options for Canada, including the following: a modified concept for deep geological disposal; storage at reactor sites; and centralized storage, either above or below ground;
 - a comparison of risks, costs and benefits of the options; these options would need to be analysed within the context of proposed siting areas;
 - an analysis of ethical and social considerations;
 - an Aboriginal consultation plan;
 - a comprehensive public participation plan.
- have an Advisory Council reflecting a broad range of scientific, technical, social sciences disciplines as well as representatives from affected populations;
- implement the government-approved long-term waste management approach using trust funds.

[On October 24, 2002, the nuclear industry announced that as required under the *NFW Act* it had formed the Nuclear Waste Management Organization (NWMO), which is proceeding with preparing the options Study.]

Institutional structures: Federal oversight

The federal government has legislative authority over the development and control of nuclear energy through the *Constitution Act* and the *Nuclear Safety and Control Act* (NSC). The *NSC Act*, however, does not cover broader financial and socio-economic oversight. Indeed, for a project of such importance and with so many ramifications, it is not sufficient for the Government, through its nuclear regulator, to control the health, safety, security, and environmental protection aspects of

nuclear fuel waste management. The impact of the project is broader, and the Government wanted to ensure that the waste would be taken care of as well in a comprehensive, cost-effective, and integrated manner.

The Government identified three key policy objectives for federal oversight:

- to have waste owners establish a segregated fund for fully financing the long-term management of nuclear fuel waste;
- to establish a reporting relationship between the federal government and the WMO for reviewing progress on a regular basis;
- to establish a federal review and approval process including access to the segregated fund.

Stakeholder consultations ensued, including with the public, and confirmed that federal legislation would likely be the best means for meeting the policy objectives. Legislation would clearly signal the Government's commitment to meet its policy objectives. Addressing the nuclear fuel waste issue in law would also provide process stability and transparency with enhanced public participation in decision-making processes.

The legislation was to provide for effective government oversight and allay public fears that the WMO would conduct long-term waste management activities without constraint. With respect to industry concerns, the legislation was to allow flexibility in the conduct of its business affairs.

Social impact: Concerns and interests

There are three groupings of social impacts that need to be addressed: determining with adequate certainty **what are the concerns and interests** of any affected population, how to **mitigate effectively** the concerns and how to **respond to public interests**. An analysis of experience gained in various countries on values which are most likely to affect the public's confidence indicates that a key value that appears to increase the probability of overall positive results beyond the basic ones of competency of the proponent and the government, is the clear demonstration by government that decisions are based on **fairness** (i.e., equity, social justice, distributive justice) to all stakeholders.

When determining the concerns and interests of populations potentially affected by a long-term waste management facility, it is important to ensure that all views are analysed and duly considered. When developing mitigating measures, it is important to demonstrate their effectiveness in alleviating social concerns. And when discussing the interests of populations, it is important to recognize the service the host community is providing to the nation and to the proponents, and the will of proponents to share the benefits gained by operating the facility.

The *NFW Act* incorporates at the legislative level requirements which establish a process for due effort in addressing social impacts. These impacts are to be addressed on the same footing as technical matters throughout the development and implementation of a solution for the long-term management of nuclear fuel waste.

Ethical considerations

With respect to increasing public confidence, there has been a lot of discussion nationally and internationally on the “ethics” of the long-term management of nuclear fuel waste. The Seaborn Panel recommended developing “an ethical assessment framework”. The *NFW Act* specifically requires “taking into account ethical considerations” for each of the options proposed by the WMO.

Ethics is the study of the code of conduct for one or more individuals based on a value system. Values can change from individual to individual, from association to association, from society to society. There is no universal or timeless right ethic. So within the context of the *NFW Act*, what does it mean to take into account ethical considerations?

Both the decision-making process and the decision itself, i.e., the means and the end, must be consistent with the values of the population that the decision maker represents. In Canada, the decision-maker would be the Government of Canada, and the social values under question would be those generally reflected in Canadian laws, which were developed democratically, and those expressed during public consultations held specifically on radioactive waste issues. For the former, it is important to consider what the laws say about who pays for “pollution”, on public consultation, on responsibility towards future generations, on representative versus participatory democracy, on the value of species compared to humans, on individual versus societal rights and duties, on distribution of resources, on the protection of culture, etc. For the latter, in the event that views differ extensively among public individuals, interests groups, independent experts, etc., an appropriate and transparent weighting of those views will be required.

On the decision-making process (the means)

An “ethical assessment” is a good tool to use for qualifying the decision-making process and asks; Are all the right questions being considered? And are all stakeholders able to express fully their views?

With respect to the right questions being posed, ethics tends to force the consideration of social values broader than those limited to day-to-day living. For instance, because of the long-term nature of the management of nuclear fuel waste, the main “ethical” issue raised so far by the public during the Seaborn Panel public hearings and in international fora, such as the NEA, is that of generational fairness, both intragenerational (i.e., this current generation’s interests versus those of the next) and intergenerational (i.e., interests among different groups of a same generation). The outcome of this debate could have an important impact on technical decisions, for example, whether to store waste or dispose of it, and whether to permanently isolate it or store it in a ‘retrievable’ form. The Seaborn Panel was asked to take into account the degree to which we, as a society, should relieve future generations of the burden of looking after our waste. Most participants in the public review, whether they favoured retrievability or not, recognised this generation’s responsibility to relieve future generations of burden of looking after our waste. They disagreed, however, on what constituted a burden and what did not. This is but one question that needs to be considered; there are many other ethical aspects that will also need to be considered, e.g., the protection of humans versus the protection of other species, the extent of protection needed in the face of potential acts of terrorism, the extent to which the proponents ought to share the benefits received from operating their waste facilities, etc.

With respect to appropriate public participation in decision-making processes, it is very important to make clear at the onset of any dialogue with the public, what is the nature of the consultations and what role can the public play in the decision-making process. Once there is a clear

understanding of nature of consultations, those consultations must be carried out with equity among all interested parties.

On the decision (the end)

The time will come when the decision-maker will have to make a decision and develop its reasoning leading towards that decision. Ethical considerations will have to be part of the reasoning and may include an assessment of:

- the appropriateness of previous activities in the decision-making process;
- equity aspects (e.g., individual interests versus society's interests; burden to existing generation versus future ones; impact on the host communities versus on more distant ones);
- risk perceptions (e.g, low probability of accident with great consequence versus greater probability of incident with smaller consequence);
- the societal principles of the day (e.g., the precautionary principle; constraints on liberty for greater security in the face of potential acts of terrorism);
- the demonstration of the degree of public confidence.

Conclusion

Canada has now adopted a legislative framework to move effectively towards the implementation of a solution for the long-term management of its nuclear fuel waste. Within three years, the NWMO will submit its proposed options for a general approach followed by a decision by the Government of Canada. The NWMO will then embark on a siting process, followed by an environmental assessment process under the *Canadian Environmental Assessment Act* and a license application process under the *NSC Act*.

We will continue to seek insight on how to achieve public confidence by effectively addressing social considerations through our own experiences, through that of other countries, and through the work of international organisations such as the NEA.

THE PORT HOPE AREA INITIATIVE

D. McCauley

Senior Policy Advisor, Uranium and Radioactive Waste Division, Natural Resources Canada

The Port Hope Area Initiative involves a process that will lead to the cleanup of low-level radioactive wastes in two communities in Southern Ontario, the Municipality of Port Hope and the Municipality of Clarington. The proposal also involves the construction of three new long-term waste management facilities in those communities.

The history of the Initiative provides important insights into the successes and failures of siting efforts.

Historical background

The wastes resulted from the operations of an industrial process in Port Hope that began in the 1930s and continues today. The process took pitchblende ore mined in the Northwest Territories and other locations and refined that material first for its radium content, and then in later years, for its uranium content. In the early operations of the refinery, the wastes were deposited at various locations within the Town of Port Hope – at the refinery itself, at certain designated residue areas, in public ravines, and on vacant lands. In 1948, the company, which by that time had been nationalised by the Government of Canada and was known as Eldorado Nuclear Limited, opened a waste management facility in a neighbouring municipality – Hope Township – and began to dispose of its waste there. The site was known as the Welcome Waste Management Facility. In 1955, Eldorado opened a second waste management facility in the current Municipality of Clarington, known as the Port Granby Waste Management Facility. That facility remained operational until 1988.

The primary contaminants in the wastes are uranium, radium, and arsenic. Specifically, the wastes within Port Hope are contaminated principally with uranium and arsenic while radium is the principal contaminant at the Welcome and Port Granby sites.

The problem of radioactive waste contamination within Port Hope was first recognised in 1974. At that time, Canada's nuclear regulator – then known as the Atomic Energy Control Board, established a Task Force to cleanup the most serious contamination. By 1981, roughly 120 000 m³ of material, mainly from residential areas, had been removed and sent out of the area for long-term management. Problems were also identified at both the Welcome and Port Granby waste facilities and the regulator ordered the company to decommission both sites.

In 1982, the Government established the Low-Level Radioactive Waste Management Office (LLRWMO) to take over the responsibilities of the Task Force and manage historic wastes on behalf of the Government across Canada. Thus, the LLRWMO began managing the material within Port Hope while Eldorado continued to manage the waste sites at Welcome and Port Granby.

Early siting efforts

Eldorado began a search for a new site for the Welcome and Port Granby wastes. Its siting efforts faced strong local opposition, particularly because a number of its proposed sites were in close proximity to the shores of Lake Ontario. In 1986, the Government of Canada intervened, directing the company to examine sites further inland and at the same time referred the project for an environmental assessment. Continued strong local opposition to any siting in the local area led the Government to postpone the environmental assessment and direct the company to stop its siting efforts.

In the light of the opposition to the companies siting efforts, the Government established a “Siting Process Task Force” to develop a more cooperative and less confrontational siting process; an alternative to the traditional approach of Decide, Announce, Defend. The Task Force released its report “Opting for Cooperation” in 1987. The report recommended a Cooperative Siting Process. The key principles of the process were: (i) that communities would volunteer to host the waste management facilities, (ii) the community should be a partner in the process, (iii) the community should have the right to select a preferred technical solution, and (iv) the community should be compensated for impacts associated with the facility and it should be provided with equity compensation to enhance its position as a result of its willingness to assist society.

The Government moved forward with the implementation of the Cooperative Siting Process. In 1988, the Minister of Energy, Mines and Resources – now Natural Resources Canada – appointed a Siting Task Force on Low-Level Radioactive Waste Management. The Siting Task Force (STF) undertook extensive consultations across the Province of Ontario inviting all 850 municipalities to volunteer to be part of the process. Initially, the STF received 26 expressions of interest in hosting the wastes. Eventually, the interest narrowed to two municipalities – the Town of Port Hope and the Town of Deep River, home to Atomic Energy of Canada Limited’s Chalk River Laboratory. Discussions proceeded with the both communities in parallel, however, the Town of Port Hope eventually withdrew from the process leaving the Town of Deep River. The STF negotiated an impact management agreement with the Town of Deep River and in 1995 recommended in its final report to the Minister that the Government proceed to develop a disposal facility there for the Port Hope area material under the terms of the impact management agreement.

The Government accepted the STF’s recommendation but required revisions to the proposal. Negotiations proceeded between the Government and the Town but no agreement was reached and the negotiations ended in 1997.

A new approach

At that time, the Government received an expression of interest from Hope Township, site of the Welcome Waste Management Facility, to begin discussions on the potential for that municipality to host some or all of the area waste. The Minister of Natural Resources Canada accepted the request to begin discussions and what resulted was a community-driven process to elaborate a conceptual proposal for managing the local wastes within the community. The Municipal Council mandated a committee of residents to work with private consultants, paid for by the Government, to develop a conceptual approach for the long-term management of the wastes.

This same process was replicated in the other two municipalities; the Town of Port Hope and Clarington, as each of the municipalities developed their own proposals to deal with their own wastes locally. At the end of the process, which lasted from 1998 to the end of 1999, all three municipalities

had passed resolutions for the long-term management of their own local wastes and had submitted these proposals to the Government for consideration.

The Government accepted the proposals as the basis of a proposed solution and approved a negotiating mandate to develop a legal agreement with the municipalities establishing the terms and conditions under which the project would proceed.

There were a number of key issues in the negotiations

First and foremost was the requirement that the community-based proposals would be documented in the legal agreement and would form its technical basis. In this manner, the communities' conceptual approaches became the foundation of the accord. In particular, the common themes of long-term, safe and environmentally-sound management of the wastes were adopted as were the communities' interests that the final facilities be aesthetically pleasing facilities that could be used for passive and active recreational activities. A cleanup approval process and methodology was developed and also incorporated in the agreement.

Property value protection was also a key issue. The municipalities were concerned about the negative economic impacts that the project might have on local real estate values and the implications for property owners who might realise these impacts on real estate transactions while the project was underway. In order to address this concern, the Government agreed to establish a Property Value Protection Program in the municipalities.

Municipal compensation also figured prominently in the negotiation of the legal agreement. The municipalities sought to be compensated for the time that their staff would have to dedicate to the project. Furthermore, the municipalities sought compensation for hosting the long-term management facilities in their communities. The compensation would be used by each of the municipalities, as they saw fit, to address long-term impacts associated with their decision to host the waste management facilities. It was also a recognition that municipalities should receive some form of economic benefit for agreeing to host facilities that other communities are unwilling to accommodate. In this regard, each of the three municipalities received the sum of \$10 million.

Another key issue was the municipalities' desire to control the final project solution. There was an understanding that the conceptual approaches defined in the legal are just that, concepts. They represent a starting point for the project. Through the environmental assessment process, the concepts will undergo further engineering and evaluation. Alternative means of carrying out the project also will be examined. Through this process, which will involve extensive public interaction, preferred alternatives will emerge. Those alternatives may be the conceptual approaches currently defined in the legal agreement or variants. Recognising the evolutionary nature of the process, the municipalities wanted to maintain control of the final project solution to ensure that it continued to represent a community-based solution.

Three elements of the legal agreement ensure this continued control. First, the proponent for the project must obtain municipal comment on any alternative means of carrying out the project it investigates. Second, the proponent may not submit an alternative as a preferred option without consulting with and obtaining the written consent of the municipalities to that option. Third, at the end of the environmental assessment process, the proponent will advise the municipalities of the decision of federal decision-makers. In the event that what has been decided upon is different to that which the municipalities have consented to, they will have ninety days to decide if they do not want to proceed with the project.

A final key issue was that the Government of Canada would be the owner of the long-term management facilities and the wastes therein and would have the long-term responsibility for monitoring and maintaining the facilities. Through the agreement, the Government has accepted these responsibilities.

Negotiations with the Port Hope area municipalities lasted most of the year 2000. They culminated in the development of *Principles of Understanding*. The *Principles* were reviewed by each of the parties independently and then initialled in October 2000. By initialling the *Principles*, each party signalled its acceptance that they could form the basis of a legal agreement establishing the terms and conditions under which the project would be conducted. The legal agreement went into force on March 29, 2001.

Project implementation

The Port Hope Area Initiative is a \$260-million, 10-year initiative by the Government of Canada to deal with the long-term management of historic wastes in the Municipality of Port Hope (the former Town of Port Hope and Hope Township) and the Municipality of Clarington.

Natural Resources Canada is the lead within the Government of Canada for the initiative and has designated the Low-Level Radioactive Waste Management Office as the proponent.

The Initiative will be carried out in three phases. These phases are as follows:

- the environmental assessment and regulatory review phase;
- the cleanup and construction phase; and
- the long-term monitoring phase.

The environmental assessment and regulatory review phase is expected to last roughly five years, from 2001 to 2006. During that process, the concepts will undergo further environmental study by the proponent, under the *Canadian Environmental Assessment Act*, according to the terms of reference defined by the decision-makers for the project – Natural Resources Canada, the Canadian Nuclear Safety Commission, and the Department of Fisheries and Oceans. The project will also undergo licensing review by the Canadian Nuclear Safety Commission, under the *Nuclear Safety and Control Act*, at the end of that process.

Following the environmental assessment and regulatory review process, the cleanup and construction phase of the project will proceed. This will involve the actual construction of the long-term waste management facilities, cleanup of contaminated lands, transportation of contaminated material to the waste management facilities, emplacement in the facilities, closure, and redevelopment of the facilities in the manner proposed. This phase is expected to last roughly five to seven years.

The long-term monitoring phase will proceed thereafter.

Conclusion

The Port Hope Area Initiative represents a potential solution to a longstanding environmental problem for the Government of Canada and the local communities where the wastes are located. The Initiative is community-driven in that the impetus for the current approach has come from the local communities and they are full parties to the legal agreement that defines the terms and conditions of how the Initiative will proceed. The environmental assessment phase of the Initiative is now underway and will be key to the evolution of the long-term solution.

MESSAGE FROM THE DEPUTY MINISTER OF NATURAL RESOURCES

G.R.M. Anderson

Deputy Minister, Natural Resources Canada

Canada is renowned for the wealth of its natural resources: vast forests and rich deposits of minerals, including uranium, oil and gas. Canada is also blessed with a variety of sources of energy, including nuclear energy. We understand that a healthy, prosperous, and sustainable society depends on using these resources wisely. Sustainable natural resources development needs to strike the right balance among our economic, environmental and social priorities.

Thus the focus of the Nuclear Energy Agency's third Forum for Stakeholder Confidence National Workshop in Ottawa October 15-19, 2002, on social considerations for increasing and maintaining public confidence in the long-term management of radioactive waste is of particular interest to us.

We hope that Canada can provide insight into these issues by discussing our recent successes with the FSC, namely the Government of Canada agreement with communities in the Port Hope area of southern Ontario on the long-term management of historic low level radioactive waste, and the development of the *Nuclear Fuel Waste Act*. We look forward to sharing our experience with you and learning from your experience.

I wish all FSC participants and the wide range of Canadian stakeholders an interesting visit to the Port Hope area and stimulating discussions during your Workshop in Ottawa.

SESSION I

What Are the Social Concerns?

*Chair: M. Fritschi
Nagra*

*Moderator: C. Mays
NEA Secretariat*

C. Kessler, Deputy Director of the OECD NEA, welcomed the delegates. The NEA has a significant set of stakeholder-centred programmes, and is happy to facilitate encounters like the Ottawa workshop bringing people together on a national and international level. P. Brown welcomed the participants on behalf of the Canadian Deputy Minister of Natural Resources. Y. LeBars, Chairman of the FSC and of France's Andra, recalled the workshop goals: to provide a review of the Canadian situation by and for stakeholders, but also to stimulate improvements in delegates' home programmes.

SOCIAL IMPACT ASSESSMENT: IDENTIFICATION, MANAGEMENT AND FOLLOW-UP OF COMMUNITY CONCERNS ASSOCIATED WITH CONSTRUCTION OF THE HIBERNIA OFFSHORE PLATFORM

K. Storey

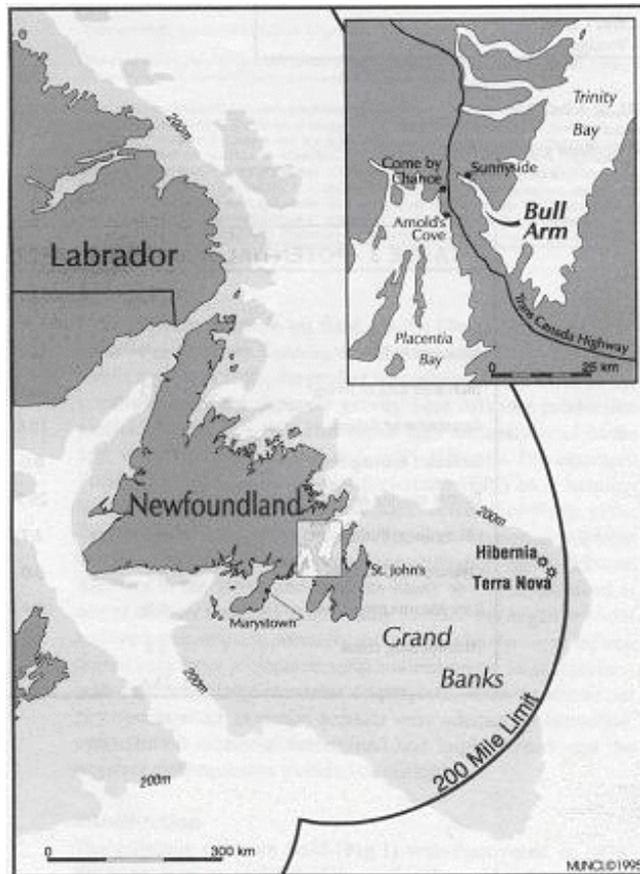
Department of Geography, Memorial University of Newfoundland, Canada

Social Impact Assessment (SIA) is the systematic analysis, in advance of the likely impacts of a proposed action, that considers “all social and cultural consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs, and generally cope as members of society” (US Department of Commerce 1994). Through the SIA for the construction of the Hibernia offshore oil platform concerns and values of local area residents were identified and a management strategy designed to minimise social disruption associated with the project. Monitoring studies showed that the strategy was effective and that few negative social impacts occurred.

The Hibernia offshore oil field, was discovered on the Grand Banks, east of the Island of Newfoundland, in 1979 (Fig. 1). The distance from shore (315km), its isolation, the periodic presence of sea ice, icebergs and fog, and frequently severe wave and wind conditions, make these waters an extremely hostile work environment. Primarily to maximise human safety, the final engineering design chosen for the project was a fixed, gravity base system (GBS) (Fig. 2).

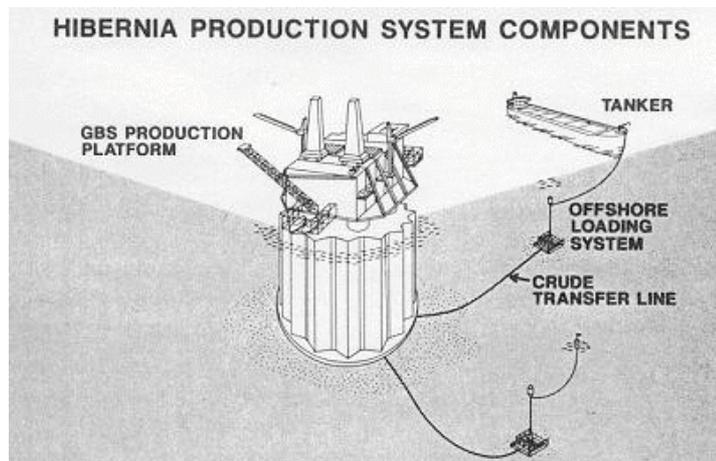
The platform functions as the main drilling and production unit, the first stage processing facility, oil storage and accommodations base for the offshore crews. The concrete base of the platform, one of the five super-modules that make up the topsides of the platform and eight of the smaller topsides-mounted modules, were fabricated in Newfoundland and the entire platform assembled at Bull Arm, Trinity Bay.

Figure 1. Hibernia field and platform construction site



Source: HMDC 1997a

Figure 2. GBS design



To monitor local residents' perceptions and attitudes towards the project and the efficacy of the management strategy, three surveys were undertaken: in 1985 just prior to the public review of the Hibernia EIS; in 1992 just as development of the platform yard was being completed and just before construction and fabrication was about to begin, and; in 1996 just after peak project employment at the yard. Tables 1 and 2 summarise the anticipated positive and negative impact for each survey.

Table 1. Potential benefits of the Hibernia Construction Project, 1985, 1992, 1996

Benefit	1985 (%)	1992 (%)	1996 (%)
Employment in general	88.7	67.7	40.0
More municipal services	43.0	0.0	0.0
More people moving in	33.9	13.7	2.8
Employment for self/family	22.9	14.7	7.1
Economic benefits	3.8	16.7	0.0
Business opportunities	2.7	28.4	4.3
Community growth/development	1.8	8.8	0.0
Use site for future projects	0.0	0.0	10.0
Community use of site facilities after project finishes	0.0	0.0	10
Training used for future employment	0.0	0.0	7.1

Source: Jones 1998

Table 2. Potential negative effects of the Hibernia Construction Project, 1985, 1992, 1996

Negative Effect	1985 (%)	1992 (%)	1996 (%)
Increased crime	51.2	51.4	2.6
Increased cost of living	33.8	16.2	2.6
Disruption of fishery	27.7	10.8	0.0
Increased housing costs	15.5	0.0	0.0
Overcrowded schools	9.2	0.0	0.0
Oil spills/pollution	6.2	2.7	5.2
People moving in	5.1	29.7	0.0
Alcohol/drug abuse	1.5	5.4	0.0
Low-income people will suffer	0.0	5.4	0.0
Unemployment/adjustment to lower incomes	0.0	0.0	43.8
Out-migration	0.0	0.0	17.5
Business losses	0.0	0.0	7

Source: Jones 1998

Employment and business opportunities appear as important potential benefit items in each survey (Table 1). Response categories concerning social impacts, however, either disappear, as the project moves forward and it becomes clear that the previously identified item is no longer relevant or unlikely, or, conversely, become important as the project nears completion.

Social impacts dominate the potential negative effects summarised in Table 2. In both of the first two surveys respondents anticipated that crime would increase. By 1996, the perceived potential for increased crime had decreased substantially. This can be partly attributed to the project entering its wind-down phase, but also because, as RCMP data confirmed, there had been virtually no increased in

crimes reported. Likewise, once the project was underway, concerns about alcohol and drug abuse failed to emerge as real issues. Similarly, the declining concern over increased costs of living, housing costs and school overcrowding were based on experience, which was also supported by the available data from housing agencies, school boards, etc.

To determine whether there had been any changes in the perceived quality of life in the area before and during the project, a “quality of life” dimensions scale was developed (Fuchs and Cake 1986). Participants were presented with 14 statements depicting various aspects of community life and asked to rate them on a five-point Likert scale. These statements were grouped into four quality of life dimensions: sociability, economic security, political efficacy and personal security. Mean ratings for each scale are summarised in Table 3. The range of means is from 5 (high) to 1 (low). A mean rating above 3 was considered positive and below 3, negative.

Mean ratings were highest for the sociability dimension, the questions and scores for which are indicated in Table 4. These findings are perhaps surprising in that the communities in the survey area showed signs of *increased* social interaction while hosting a large-scale development. This reinforces the findings summarised in Table 2 that problems perceived before the project commenced were not realised. The findings are also contrary to reported experience from elsewhere where sociability measures have typically shown a decrease (e.g., Dixon 1978; Krannich and Greider, 1984).

Table 3. Rank-order distribution of quality of life dimensions

Dimension	Average Rating		
	1985	1992	1996
Sociability	3.70	3.70	3.95
Economic security	3.15	3.24	3.06
Political efficacy	3.03	3.07	3.03
Personal security	2.74	2.83	2.97

Source: Jones 1998

Table 4. Quality of life: Sociability

Element	Average Rating		
	1985	1992	1996
People friendly and cooperative (+)	3.90	3.94	4.07
Good place to raise children (+)	3.79	3.82	4.04
Know few people (-)	3.91	3.80	4.20
Sense of belonging (+)	3.79	3.63	3.80
Seldom visit neighbours (-)	3.10	3.29	3.65
Dimension average	3.7	3.7	3.95

Source: Jones 1998

Conclusion

Overall, the Hibernia project had few negative social impacts on the host area. In large part this can be attributed to the success of the impact assessment process. The lessons learned at Hibernia, while particular to the case, do illustrate a number of general principles that might usefully be applied to other projects. Among the key elements of that process were:

Context and public involvement

Though there had been no prior experience with oil and gas development, individuals, families and communities in the area had some previous experience with large-scale construction projects; experience that had generally been positive. With limited opportunities for well-paid work in the area there was a generally positive attitude towards the project at the outset. This, combined with the proponent's community consultation process, helped develop a level of trust and cooperation and a positive perception of political efficacy on the part of area residents; a sense that was maintained throughout the project (Table 3).

Scoping of issues

The community consultation process helped identify the concerns of area residents and local values systems. This, together with comparative research of experiences from other jurisdictions, filtered through the screen of the local context, helped provide a realistic picture of potential impacts and the basis for the development of locally appropriate impact management strategies. The public involvement process also provided an opportunity for feedback and education about the assessment and management process.

Uncertainty

Uncertainties that needed to be addressed included such unresolved issues as platform design and fabrication/assembly locations. Subsequently, several unanticipated events served to delay the project, which in turn prompted project responses that had significant social implications. The uncertainty issue illustrates why effective impact assessment does not end with the project approval decision. An EIS provides an essentially static, snapshot, best-estimate image of what is predicted to occur under certain assumptions. Large-scale projects are complex and exist within a dynamic environment, and what was predicted can often become irrelevant or inaccurate over time. In this case, uncertainties were acknowledged and addressed through contingency planning and the development of adaptive management strategies.

Impact management

Accommodating workers in a high-quality workcamp was the primary social impact management tool used for this project. This strategy paid off both in terms of the generally high levels of satisfaction expressed by the workforce living there (with the associated implications for job productivity, turnover, etc.), and through avoidance of community disruption as the result of project employment. In this case the solution to the perceived potential impact issue was relatively simple, however its choice and implementation did presuppose the ability to identify a common, agreed-upon, objective that impact management was designed to achieve.

Follow-up

One objective of post-decision monitoring or follow-up is to provide information on the effectiveness of management strategies adopted to address anticipated impacts. Such a process is essential both in an immediate sense for the project in question, and in a more general sense of acquiring knowledge and experience for future projects. Social impact monitoring is rarely done and

when it is, is rarely done well. The formal monitoring of the social impacts for the Hibernia construction project yielded limited information in this regard. However, the data from the three independent surveys described do confirm the success of this particular impact management strategy and suggest a format for follow-up that could be adopted for other projects.

References

R Burdge (1998), *A Conceptual Approach to Social Impact Assessment (revised ed.)*. Middleton Wisconsin: Social Ecology Press.

M Dixon (1978), *Whatever Happened to Fairbanks? The Effects of the Trans-Alaska Pipeline on the Community of Fairbanks, Alaska*. Boulder, Colorado: Westview Press.

R Fuchs and G Cake (1986), "When David meets Goliath at Come by Chance: Rural attitudes and planning for the construction of a fixed concrete platform for the Hibernia project." (Paper presented at the Conference on Integrated Development Beyond the City, Mount Allison University, Sackville, NB, June).

HMDC (1997), "Hibernia Construction" (Information Sheet 3, Hibernia Management and Development Company Limited, St. John's).

HMDC (1997a), "Hibernia Platform" (Information Sheet 11, Hibernia Management and Development Company Limited, St. John's).

P Jones (1998), *Offshore Oil Development and Community Impacts: Changes in Attitudes and Perceptions in Communities Affected by Onshore Activities*. (Unpublished MA Thesis, Department of Geography, Memorial University, St. John's).

T F King (1998) 'How the anthropologists stole culture: A gap in American environmental impact assessment practice and how to fill it.' *Environmental Impact Assessment Review* 18: pages 117-134.

R S Krannich and T Grieder (1984), "Personal well-being in rapid growth and stable communities: multiple indicators and contrasting results" *Rural Sociology* 49, pages 541-52.

Mobil (1985), *Hibernia Development Project Environmental Impact Statement, Volume IV Socio-Economic Assessment*. St. John's: Mobil Oil Canada, Ltd.

U.S. Department of Commerce (1994), *Guidelines and Principles for Social Impact Assessment*. (Interorganizational Committee on Guidelines and Principles for Social Impact Assessment, NOAA Tech. Memo. NMFS-F/SPO-16, Washington, DC).

CRITERIA FOR PUBLIC SUPPORT FOR A WASTE MANAGEMENT CONCEPT: THE ENVIRONMENTAL ASSESSMENT PANEL'S RECOMMENDATIONS

B. Seaborn

Chairman of the former Canadian Environmental Assessment Panel on Nuclear Fuel Waste Management and Disposal Concept, Canada

I am glad that this workshop is focusing on the social impacts related to radioactive waste management facilities. The technical and scientific questions, which have over the decades received far more resources and attention, are daunting in themselves and by no means entirely answered. But the social questions, which fortunately have been receiving greater attention in recent years, are no less daunting and at least equally important from the perspective of developing good public policy.

I have been asked, in this opening session devoted to social concerns, to expand upon one of the key conclusions reached by the Canadian Environmental Assessment Panel on Nuclear Fuel Waste Management and Disposal Concept, a concept of deep rock disposal that had been submitted by Atomic Energy of Canada Limited (AECL).

Before doing so, however, I should note that during the extensive hearings held by the Panel, we heard a great deal about the public concerns and uneasiness related to nuclear fuel waste and nuclear power in general. None of these concerns will be unfamiliar to an audience like this, but they are worth re-iterating in the context of this workshop. The concerns derive, among other things:

- from the association with nuclear weapons and past disasters like Chernobyl;
- from the mystery which for most people surrounds nuclear fission and the longevity of radiation;
- from the fear of disastrous consequences if “something would go wrong”, however unlikely that “something” is in statistical terms;
- from uneasiness about a waste management system which does not envisage indefinite monitoring of what is happening in a disposal vault and the surrounding geosphere;
- from a lack of confidence in the ability of scientists to predict what is likely to happen ten thousand years from now;
- from difficulties in determining how best to protect the interests of future generations when we make decisions now about the nuclear wastes we have generated;
- from a feeling that there must be some better and less dangerous way to generate the electrical power we need.

Some of this apprehension and skepticism can be refuted at one level by scientific arguments. But the concerns nevertheless remain and are real. They have to be given serious attention in developing public policy in a democracy.

Now back to the Panel's conclusion on which I have been asked to expand. It is to be found in the chapter of our report on the safety and acceptability of the AECL concept, and it reads as follows:

“As it stands, the AECL concept for deep geological disposal has not been demonstrated to have broad public support. The concept in its current form does not have the required level of acceptability to be adopted as Canada's approach for managing nuclear fuel wastes.”

This conclusion followed from applying to the AECL concept the criteria for acceptability set out in a previous chapter of the report. This chapter dealt with the criteria for safety and acceptability, which the Panel had been asked to develop and which could be applied to any concept for nuclear waste management.

Explaining our conclusion on the lack of broad public support and failure to meet the criteria for acceptability, we stressed several points:

- the Canadian public must be well informed if it is to make decisions about the long-term management of nuclear fuel wastes;
- the agency responsible for management must conduct a sustained information and communications program and the communication must flow in both directions, both to and from the public;
- the public must be aware of, and have participated in developing the decision-making process;
- the public must know the key points at which safety and acceptability are assessed, who makes the decisions, how disputes are resolved and how the needs of significant minorities are to be addressed.

We considered that these conditions did not a present exist – in part, of course, because we were dealing with a concept rather than a real site and a real design and a real proponent.

In all fairness to AECL, they were tasked to conduct primarily a scientific and technical examination of deep rock disposal as a concept, not to conduct a social examination of the question. Nor had they been designated as the agency that would ultimately be responsible for long-term management. But our Panel had to conclude, on the basis of the documentation submitted to it, that we had not been provided with information adequate to demonstrate that the AECL concept had broad public support and acceptability. We recognized that we were not in a position to say definitively that the AECL concept lacked broad public support, nor that it was unacceptable to the Canadian public. The evidence was just not there to pronounce one way or the other.

What we said, in effect, was that a lot of work remained to be done and a lot of steps had to be taken before decision makers could feel reasonably confident that they had a solution which Canadians by and large could accept as the best, or the least bad, solution to the problem the country faced: how to manage, in the long-term, the nuclear fuel wastes which and accumulated over the years and which continue to accumulate.

You should be aware that our Panel was not limited to an examination of the acceptability of the AECL disposal concept. We were also asked to advise governments on the “steps that must be taken to ensure the safe long-term management of nuclear fuel wastes in Canada.” This was an invitation to provide policy advice, and we did not hesitate to respond in detail to that invitation. We

said that, prior to taking action that could be expected to command broad public support, there had to be more scientific and technical work done to deal with the many shortcomings detected in the AECL proposal.

And, at least as important, there had to be great amount of communication and consultation and confidence building.

If, as we concluded, the AECL concept had not been demonstrated to meet the criteria, what should be done to establish the necessary public support and level of acceptability?

I shall not take you through all our policy recommendations, and the reasoning behind each, but I would like to talk about a few of key importance.

- We saw as necessary an adequately funded process of consultation to ensure the participation of Aboriginal people. This is essential because, if a facility for waste disposal were to be established in a deep geological formation, it would most likely be located in the Canadian Shield, where Aboriginal people would be directly affected. And our Aboriginal people have methods of consultation and decision-making, as well as concerns for the natural environment, which are different from those of others.
- We recommended the creation of a Nuclear Fuel Waste Management Agency
 - at arm’s length from the current owners of the wastes;
 - fully financed by contributions from waste producers and owners (not from the taxpayers), these contributions to be kept in a segregated fund;
 - supported by a strong and active advisory council representing a broad range of interested parties, and
 - subject to multiple oversight mechanisms.

We stressed that a fresh start in the form of a new agency must be made in order to take into account the apprehensions about nuclear power that bedevil the activities and proposals of the nuclear industry, and to help establish public confidence in the system.

- We recommend the development by the Agency of practicable options for long-term management – including deep geological disposal, storage at reactor sites, and centralized storage either above or below ground. There must be comparative information on the risks, costs and benefits of all practicable options. We felt strongly that a decision should not be made on the basis of one proposal only, and that both the public and decisions-makers had to be informed about the options available.
- Further, we urged the development by the Agency of
 - a comprehensive public participation plan, which would be an ongoing interactive process;
 - an ethical and social assessment framework within which judgments could be made, and
 - a fully open and participatory process for site selection and for transportation, with full account taken of the wishes of potential host communities and directly affected communities.

The foregoing are some of what we considered to be essential if there was to be any hope of gaining, in Canada, broad public support and acceptability for any plan for long-term management of nuclear fuel wastes.

The question has been raised as to how you judge whether you have broad public support (not unanimity, of course, and not necessarily even consensus), and what is an appropriate level of acceptability. There are, as I see it, two points in time when that will be particularly important. The first is when the Waste Management Organization, in about three years from now, presents its analysis of the options for long-term management and recommends its preferred option. According to the new Act, the decision will be made by the Government. But I hope that decision will be preceded by widespread and informed public debate across the country. If so, public opinion polls, focus groups and the like should be able to gauge the degree of support. And though it is not required by the Act, I hope that the national institution of Parliament, perhaps through a joint Senate-House of Commons committee, will examine the questions thoroughly and make its recommendations. The Aboriginal people should also be thoroughly consulted at this stage as part of the ongoing consultation with them.

The second important point in time, once the decision in principle has been made, is the selection of a site or sites for the waste management facility(ies). Here it will be necessary to gauge the level of local support and acceptability. It will be essential to have in place an ongoing and interactive consultative process, with broad representation and public involvement in the decision-making process, if real support is to be obtained from potential host communities and other directly affected communities.

To conclude. As we heard yesterday, the Parliament of Canada has now passed the *Nuclear Fuel Waste Act*. It responds positively to a number of our Panel's recommendations, though in detail it falls short on a number of our other recommendations, as I explained in testimony before the Senate committee examining the Bill.

I am of course glad that action is now finally being taken. I shall watch with interest to see whether the spirit of our Panel's recommendations is to be respected in practice, even where the recommendations are not all reflected in the letter of the law. If the new Waste Management Organization keeps our advice in mind as it moves to implement the new Act, there is at least a chance that we in Canada can move towards a broadly accepted solution of the nuclear waste problem.

**WHAT ARE THE SOCIAL CONCERNS?
CONSULTATION AND RESPECT FOR THE RIGHTS OF ABORIGINAL PEOPLES**

P. Larcombe

Senior Manager, Winds and Voices Environmental Services, Canada

(presentation outline)

Large scale developments, whether hydroelectric development, mining, or forestry, to name a few types, have the potential to broadly and adversely impact on Aboriginal peoples and communities. Perhaps more so than any other segment of Canadian society, Aboriginal peoples, and particularly those residing in remote communities, are heavily reliant upon healthy environments and healthy natural resources in order to preserve and maintain their lifestyles, cultures, and economies. Further, Aboriginal peoples in Canada have the unique circumstance of having Treaty and Aboriginal rights protected under the terms of Treaties, Land Claims, and/or the *Constitution of Canada Act, 1982*.

As with other forms of large scale development, nuclear fuel waste storage and management projects may have the potential to adversely impact on Aboriginal peoples. The following presentation outlines some key considerations relevant to understanding the social concerns, consultation requirements, and best practices for involving Aboriginal peoples – the key ingredients to enhancing the confidence of Aboriginal Peoples in nuclear fuel waste storage and management projects.

What are the social concerns of Aboriginal peoples regarding large scale projects?

- maintaining water and land transportation access to/from/within traditional territories;
- protection of the quality and quantity of natural resources (water, land, plants and animals) important to lifestyle, culture and economy;
- protection of important historic, cultural and ecological sites;
- preserving the natural balance and health of the environment for the current and future generations;
- sustaining and enhancing social, cultural and economic opportunities for community members;
- protecting Treaty and Aboriginal rights now and on behalf of future generations.

Why do consultation requirements for Aboriginal peoples differ from those for the balance of the Canadian public?

- Socio-cultural and socio-economic reasons.
- Legislative requirements:
 - Treaties and Comprehensive Land Claims Agreements.
 - Constitution of Canada Act, 1982.
 - Canadian Environmental Assessment Act.
 - Canadian Environmental Protection Act.
 - Nuclear Fuel Waste Act.
- Legal jurisprudence – relevant cases in past decade.

How best to obtain confidence among Aboriginal peoples?

- comprehensive understanding and acknowledgement of Treaty and Aboriginal rights;
- know whom you must consult with;
- early involvement in the planning stage;
- early involvement in development of consultation approach;
- adequate financial and technical resources;
- adequate time-lines;
- culturally appropriate communication methods.

UNDERSTANDING COMMUNITY TRAITS – UNDERSTANDING PUBLIC CONCERNS

T. Włodarczyk
Gartner Lee Limited, Canada

Introduction

No two communities are alike. Therefore, one should not expect that public concerns and socio-economic effects of a proposed undertaking would be the same everywhere. Public concerns and the potential for social and economic effects of nuclear waste management facilities in one community will be different from those in another because communities differ in their fundamental sociological and economic traits. Research and experience with various types of nuclear and hazardous waste management facilities, generating stations and other energy developments across Canada and the United States indicate that an analysis of only a few key community traits can yield a more thorough understanding of the ways in which a community might perceive and respond to a project, the kinds of concerns that might dominate the public agenda, and the types of socio-economic effects that will be of primary concern.

Community traits

The following discusses some of these key community traits and their relationship to public concerns and socio-economic effects.

Labour force

Three labour force traits (i.e., the size of the local labour force, residents' skill levels and the extent of underemployment and unemployment) can have either a positive or negative influence on public concerns over a nuclear waste management project and the extent to which a community will experience socio-economic effects.

On the positive side, they determine the proportion of labour needs that could be met by the local labour pool and hence the potential for individuals and families in a community to realise employment benefits. The availability of new job opportunities has, in some instances, induced workers, especially those that are under-employed and/or see a potential for advancement, to leave their present employers or travel greater distances.

This was the case for the construction of new nuclear facilities throughout the 1970s and 1980s in Clarington, Ontario and at the Bruce nuclear site in Kincardine, Ontario. In 2001, the announcement of the restart of two reactors by Bruce Power resulted in increased interest in employment by Bruce Power but also raised serious concerns among economic development officials, local construction companies, trade and service firms, community service agencies, and the local government over the competition for labour.

Level of economic development

Two development traits, namely the size and diversity of the local economy, will determine the extent to which people are interested in the positive benefits of the project or have concerns over the economic future of their community.

The potential for the community to experience population growth or decline, and economic effects is largely influenced by its proximity and accessibility to a larger urban centre. Communities with more diversified economies and better developed trade and service sectors will have lower interest or concern regarding economic benefits, losses and other secondary effects. Experience indicates that this is likely the case even for projects involving facility lay-up and decommissioning projects. For example, increased concerns over the economic future of the communities of Pinawa, Manitoba and Kincardine, Ontario dominated the public agendas of these communities prior to the lay-up of nearby nuclear facilities. However, the lay-up of the Pickering A station in 1997 did not elicit strong negative concerns at the time of the lay-up, nor were the positive economic benefits of its return to service a dominant agenda item for community members or government officials. Essentially, this facility was seen as a proven contributor to the local and regional economies, but the economic viability of the local communities was not dependent on the outcome of the restart project.

Population size and density

Public concerns often stem from people's attitudes toward growth and development, particularly when rapid changes in community are anticipated. Research suggests that unless communities have a sufficient population base (i.e., over 1 000) and accompanying infrastructure, they are unlikely to grow substantially. If a community is isolated from other urban settlements such that workers have little choice but to settle there, public concerns over the socio-economic effects of rapid growth and the foreseeable community decline will tend to dominate the public agenda.

Population composition

Two community traits relating to population composition, namely age and gender, have a bearing on the nature of public concerns and extent of the socio-economic effects that will be experienced. Studies suggest that young people do not necessarily look forward to project benefits nor express concerns over socio-economic effects, but they often experience the greatest loss changes in the cost of living in the local area. Elderly or long time residents who express high levels of satisfaction with existing community conditions may be less receptive to new development and change than those who regard their community as deficient in some way. Where satisfaction with community is high among older residents, concern is likely to be focused on 'changes in community or way of life' and other qualitative aspects of community life.

Finally, most socio-economic impact assessments show that women tend to have characteristic attitudes towards nuclear projects and the effects they experience also differ from those affecting men. For example, women tend to express social concerns in terms of effects on their families, friends and future generations; while men emphasize economic concerns. Women also experience different socio-economic effects than men, in particular, isolation, loss of status and sense of self-worth in a rapidly changing or a new community. Overall, the distribution of effects among various segments of the community also influences how community members perceive the fairness of the planning and decision-making processes.

Adequacy of public sector infrastructure

Some major projects result in changes in demand for schools, hospitals, recreational facilities, sewer and water facilities, streets and highways, police and fire protection, and social services. These demands will vary over the life of the project. Research indicates that if the local community is not ready or able to cope with such demands, the number and intensity of public concerns increase. People come to feel that their quality of life is at risk and attribute even unrelated effects and issues to the project. Similarly, business interests tend to have concerns over the community becoming unfavourable for investment and the “stigma” effect of a nuclear facility in their community. Satisfaction with the community may decline, and conflicts tend to arise between the new and long-time residents.

Planning and administrative competence

Local expertise in facilities planning, budgeting, growth management and obtaining government funds is often a key determinant of the ease with which a community can address some of the most basic socio-economic concerns of their constituents. This applies not only to the local government administration but also to service agencies, clubs and other organisations and groups, both formal and informal, which play a role in providing community social service support. Concerns are best managed by “competent communities”.

Community stability and goals

Communities are not static. All communities change and evolve over time. Understanding a community’s stage of development, their goals for the future and the rate of change that is occurring will reveal the constraints and opportunities that a new development will face. It is important to understand whether the rate of change is compatible with the community’s ability to cope. In addition, a community’s development preferences will tend to influence the value residents place on the preservation or conservation of land uses, environmental resources and features which affect a community’s receptiveness to a proposal. Development goals generally reflect resident satisfaction with their community. In communities with existing nuclear facilities, levels of community satisfaction reflect people’s experience with an operating nuclear facility, its track record and effects. High levels of satisfaction can be considered an indicator of the level of comfort people may have with the facility and the extent to which the facility is seen to support their individual and community goals.

Past experience

There is a general consensus that communities that have experienced economic and population decline, especially over a period of several decades, will likely be ill prepared to manage the effects that would result from a new major development in their area, though they may be quite receptive to the prospect. On the other hand, communities that have been experiencing some growth often have a base of positive experience that may make them receptive to further change and also facilitate the management by local leaders and officials of construction and operational effects. Conversely, decommissioning projects will be seen as the “last straw” or as an erosion of past positive efforts to maintain the economic viability of their community.

Research reveals that the presence or absence of an environmental incident is the single most important explanatory variable that determines the level of public concern and the potential for community mobilisation. A community that has experienced a serious environmental problem, especially if the problem was not effectively resolved, may suffer greater psychological stress from the siting of a new facility or restart of an existing one. On the other hand, these experiences may increase community efficacy in dealing with environmental management problems.

Public attitudes

People's attitudes influence the interpretations put on events and, more importantly from a socio-economic impact perspective, the kinds of responses that are made. An individual's appraisal of a situation is perhaps the most critical determinant of public concern and behavioural responses. Because these individual appraisals are made within the community context, an understanding of broader public attitudes is essential. Some of the more important public attitudes that need to be understood include: people's satisfaction with community, their feelings of personal security, their image of the community, their definition of what is considered risky, and their desired level of personal control over hazards and risks.

For example, there is evidence to suggest that in communities highly dependent on an industry involving dangers to the community or workers, residents are generally less concerned about these dangers than those in less dependent communities. Similarly, if people feel that they can influence the outcome of a situation perceived as threatening or stressful, they are likely to become actively involved in problem-solving efforts rather than change daily behaviours or rely on emotional ways of coping with their stress.

Community culture

A community's culture can be defined as the totality of beliefs, norms, values and aesthetics that comprise the way of life of a population and the homogeneity of that culture. It will also influence the types of public concern and socio-economic effects that are experienced. Aboriginal people in Canada and other minority groups whose culture is different from that of mainstream society will have a greater range of concerns that potentially may not be understood by project proponents, and unfortunately, concerns that are often dismissed. For example, there have always been fundamental conflicts between the interests of Aboriginal populations near the Bruce nuclear site and mainstream business and government interests, conflicts stemming from disagreements over widely disparate social values placed on the resource base.

Community cohesion

A community's cohesion, measured in terms of the level of interaction and interdependence of individuals, groups and institutions, is an important determinant of potential socio-economic effects and a predictor of the intensity with which a community will respond to a project. In a cohesive community, the level of social support will be high; public concerns tend to be more homogeneous. To varying degrees, cohesiveness in a community will reinforce residents' sense of belonging and psychological identification with community and will foster strong concern over the community's well being and future. Generally, the more cohesive a community is, the better able it will be to accommodate the effects associated with development or change. For example, residents of the City of

Pickering have a history of strong involvement in local affairs, particularly environmental issues. Such experiences have demonstrated the following:

- that residents and the community as a whole are very knowledgeable on environmental issues and capable of legitimately, formally or informally resolving issues of concern to them;
- that community members do not depend exclusively on formal political and institutional processes as the means for defining and attaining their collective goals; and
- that in the past, the need to address environmental issues has not adversely affected the cohesiveness of the community by polarizing residents, but rather that the community's response has enhanced its cohesion and has made it more resilient.

Conclusion

Public concerns and the potential for social and economic effects of nuclear waste management facilities in one community will be different from those in another because communities differ in their fundamental sociological and economic traits. Understanding the traits of the communities potentially affected by a project can yield a more thorough understanding of the ways in which residents might perceive and respond to a project, the kinds of concerns that might dominate the public agenda, and the types of socio-economic effects that will be of primary concern.

PORT HOPE AND AREA PROPERTY VALUE PROTECTION PROGRAM: CREATING STABILITY IN THE MARKETPLACE

R. Zelmer

Director, Low-Level Radioactive Waste Management Office, Canada
(Contributors: B. Flynn – Property Value Protection Program Coordinator
and G. Case – Engineering and Operations Manager, LLRWMO)

Introduction

The Property Value Protection (PVP) Program offers an innovative approach to address the risk of individual property value loss resulting from the cleanup and long-term management of low-level radioactive waste in the Port Hope area. In its first year of operation, the program has created stability in the marketplace and provided the communities' property owners with the assurance that their investment in their homes and properties will be protected.

The PVP Program is part of the Port Hope Area Initiative (the Initiative), encompassing the *Port Hope Project* for the cleanup of low-level radioactive waste and the development of two long-term, low-level radioactive waste management facilities in the Municipality of Port Hope, Ontario, Canada, and the *Port Granby Project* involving the development of a long-term, low-level radioactive waste management facility near Port Granby in the neighbouring Municipality of Clarington, Ontario, Canada.

The terms of reference for the Property Value Protection Program were established with the signing of the Legal Agreement for the Port Hope Area Initiative in March 2001. As such, the participants of the Property Value Protection Program are the signatories to the Legal Agreement – the Municipality of Port Hope,¹ the Municipality of Clarington and the Government of Canada. The Legal Agreement stipulated that Property Value Protection must be made available to eligible property owners within six months of the signing and, in accordance with this condition, the PVP Program office was opened on October 1, 2001.

The establishment of the PVP Program is regarded as an integral component of the Initiative as it reflects the desire and commitment of the municipal councils of Port Hope and Clarington and the Government of Canada to mitigate potential, interim economic effects that may arise from the Initiative. The PVP Program may borrow elements from existing compensation programs elsewhere, yet in its entirety, the Property Value Protection Program is considered to be an original solution that will protect the needs of the area's property owners throughout the duration of the Initiative and into the first two years of long-term monitoring and surveillance of the waste management facilities.

1. The Legal Agreement was signed by the former Town of Port Hope and the former Township of Hope prior to their amalgamation in January 2001.

What is the property value protection program?

The PVP Program compensates owners of residential, commercial or industrial properties in designated parts of the municipalities of Port Hope and Clarington who realise financial loss on the sale of their property, loss of rental income or mortgage renewal difficulties as a result of the Initiative. The program encompasses an area of approximately 90 km², referred to as the Property Value Protection Zone, comprising a total of 5 128 properties at an assessed value of \$586 million, as of 2000. Property Value Protection will remain in effect for the period of the Initiative, retroactive to October 6, 2000, and up until two years after the completion of the long-term management facilities. It is estimated to run for approximately 12 years.

Section 8 of the Legal Agreement defines how the Property Value Protection Program will function. Section 9 describes a related activity to the Property Value Protection Program, Municipal Protection for Diminished Tax Revenue, which is the provision of compensation to the municipalities for lost tax revenue resulting from diminished market value assessment of properties affected by the Initiative. The key features of Section 8 include the following:

- a claim process;
- an appeal process;
- the appointment by the Crown of independent compensation officers to hear appeals.

Developing the PVP program

The PVP Program was designed to meet the program objectives of fairness to potential claimants while providing financial accountability to the Government of Canada. The Low-Level Radioactive Management Office engaged consultants to develop a conceptual design, initial cost estimates and general operational details of the PVP Program.

The consultants undertook case study research to determine impacts on property values related to other waste management sites and nuclear facilities. This provided information about the impacts that might be expected in the Port Hope area. The LLRWMO used this background information to develop the PVP Program into its current format.

The PVP Program is staffed by a program co-ordinator, financial analyst, community liaison officer and administrative assistant. Four compensation officers, endorsed by the municipalities and appointed by the Crown from within the communities for their local knowledge and records of community service, adjudicate the appeal process, consisting of mediation and/or arbitration hearings.

PVP Program's first year

During the PVP Program's first year of operation, the following major activities occurred:

- Establishment of a downtown office to accommodate walk-in inquiries and the development of program documentation and procedures.
- Ongoing stakeholder communication with the municipalities of Port Hope and Clarington, area real estate boards, members of provincial and federal parliament and the public.

- Monthly reporting to four government agencies: Natural Resources Canada, Atomic Energy of Canada Limited, Municipality of Port Hope and Municipality of Clarington.
- Development of claim process documentation, including claim application forms for loss on sale or rental of residential, commercial and industrial properties and for mortgage renewal difficulties.
- Communication initiatives including media interviews, development of Information Sheets and displays and presentations to councils, area service groups and the real estate sector.
- Development and operation of a Geographic Information System real estate market database used to analyze sales data and market trends within the PVP Program Zone and the control areas of the adjacent Town of Cobourg and surrounding rural areas.
- Development of the appeal process, including the training of compensation officers.
- Development of a customized process to track assessment changes resulting from Property Value Protection Program claims under Article 9 of the Legal Agreement.

Managing claims and establishing the database

In its first year of operation, two claims were submitted for compensation through the PVP Program. The office granted partial validation of the first claim and rejected the second. Market analysis of the second claim determined there was no effect on the value of the property resulting from the Port Hope Area Initiative and the selling price was within market range. No appeals were launched. More than 40 claims forms were given out over the first 12 months. The majority of the public who inquired about the PVP Program seemed satisfied to learn that compensation was available should they ever need it.

During this period, the office's analysis of its real estate database showed no generalised decline in the market as a result of the Port Hope Area Initiative. Although this did not preclude the possibility that specific, localized properties might be affected by elements of the Initiative, it was evident that the presence of the Property Value Protection Program, with its offer of compensation, did not contribute to an increased desire on the part of area property owners to sell. It became evident that the public perceives the PVP Program as an "insurance policy" to mitigate potential property value losses, should they occur.

The future

Predicting the degree of claim activity in the years preceding cleanup and construction is difficult. Over the next three to four years, the area real estate market has the potential to react to a number of activities related to the Port Hope Area Initiative. Community consultation and communication activities associated with the Environmental Assessment phase of the Port Hope Area Initiative will highlight a variety of issues that could result in Property Value Protection claims. Among these are:

- Public discussions about transportation routes and alternative means, including alternative facility siting options;
- A low-level radioactive waste re-survey program of more than 4 000 Port Hope properties;

- The scheduled announcement of preferred alternatives by the end of 2003, when the location, number and nature of the long-term waste management facilities will be made public.

By mid-2005, with the anticipated completion of the Environmental Assessment phase and subsequent decisions on the Port Hope and Port Granby projects by the federal Responsible Authorities (Natural Resources Canada, Canadian Nuclear Safety Commission and Fisheries and Oceans Canada), a further increase in Property Value Protection claim activity may result. The majority of PVP Program claims are expected to occur once construction begins.

WHAT ARE THE SOCIAL CONCERNS? ROUND TABLE DISCUSSIONS DURING SESSION I OF THE FSC WORKSHOP IN CANADA

C. Mays

Consultant to NEA Secretariat

The first session of the Ottawa Workshop addressed the identification of social concerns regarding the management of low-level radioactive waste and nuclear fuel waste. The Forum on Stakeholder Confidence recognises that concerns about e.g., equity, lifestyle, culture and economy are intrinsically important. These concerns also form the context of radioactive waste management, and so institutional frameworks must address them.

Canadian legislation sets up assurance that due consideration will be given to social concerns. The Canadian *Environmental Assessment Act* requires that proposed large infrastructure projects be assessed for adverse effects on the environment, including social and economic impacts (Ferch, this volume). The requirements on social impact assessment have recently been reinforced.

The new Canadian *Nuclear Fuel Waste Act*¹ (*NFWA*) was voted in Summer 2002 and brought into force in November 2002. It directs the nuclear energy corporations to establish a waste management organisation. This organisation must propose at least three approaches² for the management of fuel waste, and then implement the approach that is selected or approved by the Governor in Council. The *NFWA* explicitly requires the study of ethical, social and economic considerations, as well as relative benefits, risks and costs associated with each proposed management approach³.

Workshop Session I speaker K. Storey outlined methods that may be used to identify, respond to and monitor community concerns about a given industrial project. T. Wlodarczyk spoke of sociological and economic “traits” influencing community response to a project. P. Larcombe reviewed the specific concerns of Aboriginal peoples regarding large-scale developments that impact their natural resource base. She also outlined how authorities or researchers consulting Aboriginal peoples may have to adapt their approach. B. Seaborn, Chairman of the former NFW Management and Disposal Concept Environmental Assessment Panel explained panel recommendations aimed at increasing public confidence. R. Zelmer spoke for the Port Hope and Area Property Value Protection program, showing how municipal councils, low-level radioactive waste (LLRW) managers and the government of Canada jointly addressed one dominant local concern.

-
1. An Act respecting the long-term management of nuclear fuel waste (*Nuclear Fuel Waste Act*), Chapter 23, 49-50-51 Elizabeth II, 13th June 2002.
 2. Subsection 12(2) of the *Nuclear Fuel Waste Act* states that “each of the following methods must be the sole basis of at least one approach: (a) deep geological disposal in the Canadian Shield (...); (b) storage at nuclear reactor sites; and (c) centralised storage, either above or below ground.”.
 3. Subsection 12(4).

Workshop delegates then discussed the presentations at round tables. The organisers provided five questions to frame the discussion. The aim was not to reach consensus nor to develop a joint statement, but to foster exchange. The remainder of this report draws on the synthesis given by a facilitator from each of the eight round tables. Rather than stating conclusions, this report reflects issues to be kept in mind, experience from the participants, and open questions raised by the presentations.

Question 1: How are social concerns identified?

Legislation across nations now recognises that radioactive waste management (RWM) involves both technical and societal dimensions – they cannot be dissociated. The process through which society generates, evaluates and makes decisions is as important as the technology that is developed, chosen and applied. Social and ethical concerns in regard to RWM must be captured and addressed by the process (while remembering that the process will itself generate some concern). Achieving this requires stakeholder participation. One round table noted that social and ethical concerns should shape the technical design concept – rather than a pre-determined design creating social concerns about how it was chosen and whether it will perform properly.

In light of the case studies, and given the workshop participation of nuclear host community representatives, the following typical concerns were pointed to: health impacts, the long-term viability of the community, land uses, economic development, the timetable for projects, corporate memory of the site and facility, long-term responsibility and record keeping. While such social concerns seem familiar, they are diverse, because each community's own concerns reflect their specific geography, history and cultural context. The discussion groups noted that in general, there are differences between *individual* concerns (regarding personal assets such as a house or job), *community* concerns (e.g., way of life) and *societal* concerns such as health for future generations. The concerns that can be found on a broad national level are different from those that will be found in a local context. Local concerns have often been documented. In contrast national debate, which would allow broader societal concerns to be worked out, has not taken place in many countries.

Both formal and informal mechanisms for identifying social concerns are viewed as important. The institutional framework must support and encourage both. Environmental and social impact assessments provide opportunities mostly for *formal* procedures like consultation, hearings, surveys, etc. If affected groups are involved early, e.g., at the phase of a scoping document, then the management process can respond more efficiently to concerns.

Informal mechanisms for identifying social concerns are of many different natures. For instance, concerns can be identified in the issues voters want to discuss with candidates. Mayor Austin of Port Hope recalled that the selection of disposal concepts as well as completion of the agreement with the Canadian Federal Government were major issues confronting both him and his predecessor in their local election campaigns. This example highlights the fact that dominant social concerns at a given time and place are shaped by the phase and content of radioactive waste management decision making.

Real-time events may bring out concerns: in the Port Hope area, trees dying behind a school yard and a slumping disposal cell at the lakefront Fort Granby site made communities feel that urgent action was needed. Furthermore, the affected communities grew concerned about their own role in the process. They came to understand that they should play an active role in finding solutions to the contamination issues affecting them locally, because other groups in society were advocating for solutions that did not necessarily take the Port Hope area interests specifically into account.

Community liaison groups are pointed to as valuable tools for uncovering social concerns and bringing them to the attention of authorities in a problem-solving setting. This highlights the need for good communication channels between the community and authorities. The relevant authorities must be accessible, and the contact persons who receive concerns and questions should have authority to address them. Top management should visit local sites regularly.

Discussants pointed out that it is not hard to identify social concerns, especially if the community is knowledgeable and takes an active role in communicating concerns. Organizations can perform local surveys or interview key local actors and interested parties.

Social concerns cannot be dissociated from the people who have and express them. They belong to individuals or subgroups of a community, not necessarily to the entire community. Consultations must seek out a good range of voices. Some concerns may conflict, so there must be some mechanism to negotiate or arbitrate conflicting interests. The concerns are also apt to change over time, and so they must be monitored.

The observations above reflect local contexts, visible issues, and situations where communities feel the need to work out decisions and solutions. A contrasting example was cited of host communities who develop a sense of frustration or even apathy, because the facility that is a continuing source of conflict never goes away.

Discussants felt it may be difficult to foster productive debate and discussion of RWM issues on a national level or in communities who are suddenly confronted with the issues from outside. In some communities, facing decisions about RWM has created divisions, strife and stress. Implementers have sometimes had to leave communities to relieve this situation. Research on siting non-RWM infrastructure has shown that in some cases local divisions can be felt long after a project has been abandoned.

Discussants recommended that the institutional framework foresee sufficient time for collective learning about the need for management, the choices that are open, and their potential impacts. This implies that full information must be provided on each of these aspects. Finally, it implies that comparative options should be jointly (and not sequentially) evaluated, so that the basic values and standards to which any option should be held can be more clearly worked out.

Participants discussed consultation procedures, such as focus groups, that work like a simulation exercise. Such simulations can be introduced early in a stepwise approach. Likely needs and the basic values underlying concerns can be drawn out and used as guidelines. This allows process and plans to be adjusted before a community or set of actors is faced by a real decision.

RWM institutions can bring many resources to bear on discovering the concerns, values and views in affected groups among the public. Discussants recognized that society should also bring out and examine the different values (especially hidden values) within the central stakeholder organisations such as regulators, implementers, NGOs, pressure groups and local decision makers. Local stakeholders, for instance, need to be able to verify the intentions of other actors, and receive satisfactory answers to questions about the plans and techniques proposed for RWM. To find out basic (and hidden) values, some programme of “stretching” or checking of claims is needed, in which the central organisations are bound to respond to questions from other stakeholders.

Question 2: What are the areas of mutual understanding or of tension between stakeholders? What concerns do these tensions involve?

In both the Canadian case studies and in experience brought by FSC participants, health concerns are often at issue. There is a need for transparent procedures to deal with these. The sign that a problem is recognised is that a system is set up to deal with it. Tension starts to be relieved when there is confidence that reliable information is available. The regulatory body can play a very important role here as a neutral champion of health standards and source of expertise. The implementer as well is often pressed into service as the technical expert.

Question 3: Do the stakeholders enjoy mutual trust? Have events damaged or increased trust levels?

Trust is case- and site-specific and also project-specific. It will also change over time depending on events.

The Canadian case studies highlighted the way past events influence trust among actors and the confidence accorded to the RWM process. Concerned publics make a link between today's plans and their past experience with the nuclear industry. They judge past practice, as well, with today's values.

Participants felt that there is a need sometimes to wipe the slate clean and start over with new actors and new relationships, whether on a national level or in a local context like that of Port Hope. The Seaborn panel recommendations on creating a new, independent waste management organisation "at arm's length" from waste producers responded to the low trust accorded to Atomic Energy Canada Ltd. In the Port Hope area, in order to regain confidence in the management process local stakeholders had to become very active and take that management into their own hands.

The Pinawa experience was discussed at one table. This company town feels concern over the postponed decommissioning of the former AECL facility. With unpleasant memory of past events, they are not confident that the corporation is upholding its responsibility to the community and to future generations.

The discussion groups noted that at the end of the mining cycle, local elected officials may be left knowing very little about tailings management. The professional corps with specific know-how has left the scene, and concerned people have to depend upon information from industry, the media, government, and experts. There may be a breakdown of basic education and skills in our society covering waste production and management. In today's context of specialization, it may be desirable to build up competence with a permanent and publicly visible social relation between the communities and the waste management process.

In communities or contexts dealing with a legacy of low trust, managing today's issues requires finding a way to start over and create the sense that a new partnership is moving forward. This requires stakeholders to commit to listening to each other and getting to know each other's history and future-oriented values. The long-term nature of radioactive waste means that the partnership will have time to develop credibility and confidence (as well as time to experience new trust-destroying events if care is not taken to avoid them).

Question 4: Which issues and concerns are open to “negotiation”? Which issues continue to polarise the stakeholders?

Some communities develop a collective sense of how they want to address concerns through meetings and discussions between themselves and the waste management facility proponent.

The round tables talked about their experience with local negotiation. Starting with informal discussion may work better because it is less intimidating and ‘non-experts’ may be more able to contribute to the debate and engage with other actors. To effectively involve the public there must be informal, accessible negotiations that are not seen to be bounded by red tape. However, in order for the final outcome of discussions to be recognised as legitimate, there has to be a formal agreement between parties, which will involve formal negotiation.

The more people are involved in the formal negotiations, the more difficult it becomes to reach agreement. On a practical level as well is it difficult to involve lots of people. Still, this must always be the aim, in order to get the best representation possible of the diversity of concerns. If a big group of people is involved in a discussion the best way may be to split people into smaller groups, as this enables more detailed discussion to take place. The same logic holds for splitting people into committees to deal with specific groups of concerns, before bringing their conclusions back to a main deliberating group.

Question 5: Do citizens and communities feel their concerns are properly conveyed by elected or non-elected representatives? Do they feel their concerns are taken into account by managing and official actors? Are citizens and communities content with delegating to these actors? Do these actors enjoy sufficient societal legitimacy?

Discussants pointed out that politicians, like the media, do not only transmit or represent social concerns. They also identify and define social concerns as they see them and present them to people, thereby shaping the views of the community.

Attempts to get direct representation of concerns from all sectors of the community can run into the problem of the “silent majority”. Views may be diverse within this majority group, but as the persons do not express themselves in the open forum it may be hard to verify what their concerns and values are. In order to have confidence that the fullest range of views is taken into account, active parties should identify different components of the silent majority and arrange for them to be spoken for by politicians or other accountable representatives. The accountability of such spokespersons is particularly important at the phase of negotiation – when one recalls that communities can become divided by waste management decision making.

If a community is to be represented by a group of citizens careful consideration has to be given to the membership of the group. It must balance interest groups and reflect different sectors of the community. Length of service is also important: individual persons should be replaced on a regular basis to refresh input and prevent the group from stagnating, while still maintaining continuity.

The citizens in the representative group must have the confidence of the wider community and have the ability to speak on their behalf. Therefore the persons involved must be known, trusted and respected by the community at large.

The considerations above involve local contexts or negotiations in which the stakeholders needing representation are well-identified. In the case of national debate or decision making, or when

trying to respect the interests of future stakeholders, the legitimacy of government decisions in the eyes of the people is paramount. The issue of how this legitimacy can be assured needs further attention and discussion.

Workshop participants saw the Seaborn panel process and recommendations as valuable experience for guiding future steps of high-level RWM management in Canada. The Nuclear Waste Management Organisation (NWMO) and Canadian society face great challenges to meet the requirements laid out by the *NWFA*. Three years is a short period to organise a national debate, comprehensive of issues, involving all parties and yielding a solid basis for decision. Many different levels of social concern and stakeholder sectors are involved at the same time. Canada is a unique federal structure in which Aboriginal nations with their own governance traditions and sets of rights are on an equal footing with “mainstream” institutions. A large-scale consultation of the sort implied by the *NWFA* has never been conducted before, and contacts with the various groups, especially Aboriginal peoples, may need time to develop and bear fruit.

At this time, only one of the three or more options that must be presented by the NWMO (i.e., storage at existing nuclear generator sites) is actually associated with identified local settings. Utilities are licensed to store onsite at this time, although the licenses must be renewed at regular intervals. Debate and deliberation on this option will necessarily be different than that associated with other, less-localised options. Discussants anticipated that the nuclear host municipalities will play an active role in pushing for analysis of the other options.

As structured today, the future national debate on nuclear fuel waste management will be separate from any review of energy production and the nuclear fuel cycle. Still, groups in Canada have divergent views regarding the RWM issues associated with a potential future expansion of nuclear power. Their stakes and concerns, workshop discussants pointed out, may surface in the waste consultation. The review of nuclear power has been promised in Canada, and would be opportune in light of the Kyoto sustainability commitments. The interlocking of these issues, while arrangements for deliberation remain separate, suggested to discussants that the legitimacy of the planned waste consultation and its results might come into issue.

SESSION II

How to Address Social Concerns?

Chair: P. Ormai

PURAM

Moderator: J. Kotra

US-NRC

NUCLEAR POWER PLANTS IN CANADA: HOW WE ADDRESS COMMUNITY ISSUES AND CONCERNS

D. McFarlane

Director, Site Public Affairs, Ontario Power Generation

(Contributors: Kathleen Duguay, New Brunswick Power; Marcelle Trépanier, Hydro-Québec)

Summary by NEA Secretariat

This presentation was developed by the public affairs staff of three Canadian utilities who offered case studies from three nuclear generating stations.

Ontario Power Generation (OPG) facilities include Pickering Nuclear, with 8 units, and Darlington Nuclear, with 4 units, both located in the Region of Durham. The Pickering community is located east of Toronto on the shore of Lake Ontario. The facilities are located in the City of Pickering but are close to Ajax and the City of Toronto as well. They are surrounded by residences and businesses. The Darlington station is close to Pickering but further east of Toronto. It is located in a more rural environment in the Municipality of Clarington.

Approximately 96% of installed capacity in Québec is based on hydropower. Hydro-Québec's Gentilly-2 is the only thermal nuclear generation station in operation. The station is located in Bécancour on the south shore of the St. Lawrence River between Québec City and Montréal. The population of Bécancour is 12 000, while Trois-Rivières and Champlain, on the north shore, count 100 000 residents.

New Brunswick Power's Point Lepreau generating station (PLGS) is the only nuclear facility in Atlantic Canada, and supplies some 30% of in-province energy. The station is located in a rural area on the Lepreau peninsula overlooking the Bay of Fundy. It is located within 10 kilometers of the small communities of Dipper Harbour, Maces Bay, Little Lepreau and Chance Harbour. Approximately 38 kilometers to the northeast is located Saint John with a population of about 120 000.

Corporate-community relations objectives are similar across the three utilities. They include building trust, garnering support for ongoing operations, and being – as well as being viewed as – a good corporate citizen. Meeting these objectives implies knowing and caring for the community and the issues raised by residents – not just issues of interest to the company. Actions taken include:

- Providing information.
 - Information centres, newsletters, fact sheets, toll free telephone lines, web sites.
- Engaging in dialogue.
 - Council presentations, Stakeholder and/or Community meetings, Advisory committees.

- Contributing resources and time to community priorities.
 - Corporate citizenship, involvement in community organizations, sponsorship of community events.

Specific projects or events offer the opportunity to improve corporate awareness of community needs and upgrade interactions. The Point Lepreau plant refurbishment is a case in point. Prior to 1999, PLGS's external community program was scaled back and a reactive approach adopted. For those who wanted information, station tours and a limited website were available. As of December 2001 NB Power completed a two-year assessment to define the scope and cost for the refurbishment. The project would require fuel channel replacement and additional equipment upgrades during an 18-month outage planned to begin in 2006, as well as construction of new structures at the on-site solid RWM facility. The \$850 M (Canadian) project would maintain production from the station for an additional 25-30 years.

New communication programs were implemented as part of the refurbishment project, including extensive employee and public consultation, open houses, and media relations. Numerous public affairs activities were held in support of the regulatory and approvals processes, the web site was improved, and NB Power became a more active participant in community events. Stakeholder workshops received updates on project status and the regulatory review as well as an outline of environmental assessment methodology. They produced stakeholder input and general agreement on valued environmental components, the approach to assessment, and a list of other potentially affected projects. The more than 60 invitees included municipal leaders, government agencies, First Nations, fishing, health and social justice organisations.

Public affairs projects for the future include a Community Liaison Group, a regular public information newsletter, continuing upgrade of the web site, and modifications to the current visitor's center to compensate for the termination of station tours in response to the events of September 11, 2001.

HQ Gentilly-2 makes an important contribution to the regional economy. There is frequent communication with key stakeholders including regional departments of civil security, health and emergency preparedness. The public affairs department is responsive to requests for information, and launches pro-active communications in regard to specific projects like the Spent Fuel Dry Storage Project or, currently, the Environmental Assessment for Gentilly-2 refurbishment. The current goal in public affairs is to develop a pro-active communications strategy with annual programs including:

- Membership in local associations.
- Listening to the community, establishing partnerships and harmonious relationships with the local population.
- Upgrading the Information Center and promoting its use for student visits and year-round.
- Encouraging information access via dedicated phone lines and internet.

The Public Affairs Division at Pickering A today is mandated to lead the way in generating public support without which the station cannot operate. Prior to 1997, no Public Affairs strategy had been in place for 4 years. The division was understaffed and located offsite. The company was viewed as arrogant and secretive, and received negative media coverage. The Pickering A restart signified the need to turn this situation around. From late 1997 to mid 1999, actions included annual community meetings, quarterly newsletters, meetings with municipal, provincial and federal politicians. Contacts

were established throughout the community, in business, education, charity groups and other organisations. An early warning protocol was established to keep the municipality and citizens informed of any major or minor occurrences including positive ones.

A 1999 review identified the need to do more. Efforts thus increased significantly to include:

- Public report cards.
- Education programs.
- Local media strategy.
- Enhanced Corporate Citizenship program.
- Business breakfasts with site Vice Presidents.
- Involvement in community organizations and events – which may be hosted in the Information Center.
- Partnerships with a variety of organisations.

In an innovative Neighbourhood Walk campaign, plant workers – community members themselves – went to see their neighbours and offered to answer their questions. New arrivals in the community also receive an informative visit. One hundred and sixty issues of concern (including technical issues) have been identified and staff is working through them. Some concrete changes have been made in plant operations on this basis.

Public Affairs staff recognise the difficulty of drawing out opinion and interest from the silent majority. They are exploring new channels for information exchange like web-based tools.

THE IMPORTANCE OF COMMUNITY TRUST IN ADVANCING SOLUTIONS TO THE LOW-LEVEL RADIOACTIVE WASTE PROBLEM IN THE PORT HOPE ONTARIO AREA

B. Holton
Holton Flowers, Canada

I grew up in the town of Port Hope. As a child, my perception of “the refinery by the lake” and its economic and social impact on the community was prejudiced by the fact that my father made his living there. Breakfast, lunch and dinner, the kind of car we drove, the number of gifts under the tree Christmas morning; all of those things were dependant on that weekly pay cheque my dad brought home from “the plant”. No matter how many times they changed the name, from Eldorado Mining and Refining to Eldorado Nuclear to Eldorado Resources, it wasn’t a place that refined uranium so much. To me Eldorado was a group of family friends who arranged company barbecues in July and threw gigantic Christmas parties in the high school gymnasium in December. All my childhood friends were Eldorado kids. The company sponsored local baseball, put hockey teams on the ice and donated money to build the local sports complex. It seems that as kids we never paid any attention to what was produced at Eldorado because, really, that was unimportant. What was important was the fact they paid our dads to work there. Sure we got ribbed about glowing in the dark, about radiating friendship and being able to read at night without a night light. But those jokes went in one ear and out the other because, for the most part, we didn’t have a clue what they meant. Remember, we were just kids.

Fortunately or unfortunately kids grow up. By 1976 word was spreading nationwide about Port Hope. News reports of contaminated houses and schools and tranquil ravines contaminated with radioactive waste were in the news nightly. We started to realise that the economic benefits of hosting a government owned uranium refinery in the heart of our town do not come without its downside. At the age of twenty-four my wife and I opened a retail business on Port Hope’s heritage main street. Like merchants around us we worked hard trying to propagate a viable tourist trade to complement the local business traffic. It seemed like an uphill battle trying to compete with the news media. We wanted visitors to come and spend the day here, enjoy the shopping and indulge in some quiet enjoyment. Journalists, meanwhile, worked overtime to inform those same visitors of the radioactive perils that were lying in wait. Our new reputation as “the radioactive hotbed of the country” put the brakes on both residential and commercial development. Our budding tourist traffic dried up completely, in fact, some who lived here either packed up and moved or at least gave it thoughtful consideration.

While government officials worked hard to educate the public and put the health risks into perspective, a lot of people just simply wouldn’t buy it. How could the citizens of Port Hope ever trust an official employed by the same government that had just turned their sleepy little hometown upside down? And so it became an “us against them” mentality. They told us that the health risks to citizens were negligible, equivalent to one chest X-ray per year, yet Health Canada was commissioned to conduct a cancer study within the town to look for irregularities. The results of the study published at a much later date took a back seat to the shocking realisation that a study to measure increased cancer rates was needed at all.

Work began on cleaning up the most urgent problems. A school was closed and its student population transferred to safer ground. Back yards were dug up, homes decontaminated, park areas and ravines fenced off and signed with “radioactive” emblems and the most asked question all this time became, “if it’s not a major health risk then why are they spending so much money cleaning it up?” From that time on we could never use the term “business as usual” again. Digging out the back yard to construct a pool or build a new deck now meant having the soil tested for contaminants by a construction monitoring official of the Low-level Radioactive Waste Management Office. Locating your business to Port Hope meant adding one more layer of government red tape to the list of things to do. Making a residential real estate purchase now required a certificate from the Atomic Energy Control Board. Even into the 1990s when the story no longer attracted national attention, the economic fallout continued. Ron Smith who held the Mayor’s chair during the mid to late 1990s still remembers town hall staff losing one to two business inquiries a month once the contaminated landfill question was broached.

From an economic point of view, we were in the middle of a crisis and it seemed hopeless to expect a solution, based on the knowledge that the Government of Canada, whom you would normally turn to for protection from corporate wrongdoing was now, we thought, the corporate wrongdoer. In this most unusual case, the company on trial was now also the judge and jury. It was like punching your brother in the nose and then asking yourself whether you should be punished. A conflict of interest, you might say. So how, we asked, would justice prevail and how would this problem ever be resolved?

From 1981 until the 1988 work on solving the Port Hope problem seemed to stop dead. Then in 1988 the federal government set up a siting task force to find a community within Ontario willing to host a storage facility for Port Hope’s contaminated waste. In Port Hope a local “Citizens Liaison Group” (CLG) was set up to look at potential solutions from a source community’s point of view. They reviewed information on such topics as how and to what degree the contaminated soil should be removed and came up with a remedial clean up plan for the town of Port Hope. Although studies done by independent consultants to help in the creation of the remedial action plan were paid for by the Federal Government, they were commissioned by the CLG. This meant that studies could be done in a completely unbiased fashion. Members of the public felt assured that each study would uncover the best way as opposed to the easiest or cheapest way of solving the waste problem plaguing Port Hope. To many weary citizens, who had grown to mistrust the government, this group of community volunteers represented an important interest group. Finally we had people at the table who would look after the best interest of local townspeople. These were our next-door neighbours and friends, people who, like us, had children, owned homes and ran businesses within the community. These were people who had a real stake in making sure that solutions to the LLRW problem were in the best interests of the people of Port Hope. Most importantly the group represented no one particular interest group. Some were left of centre, some were right of centre but collectively they were all working for the best possible solution to a crippling community problem. They worked hard digesting complicated technical information and helping local citizens make sense of the process.

Eight fruitless years went by. With the Siting Task Force nearing the end of its tenure only one promising host community remained in the running and hopes of success with that community were fading fast. The Port Hope municipal government of the day felt compelled to come up with a locally driven solution and had themselves put on the list of possible hosts. Then Mayor, Ron Smith was particularly intrigued by the “cavern idea” of building large tunnels under Lake Ontario and depositing the waste from the three local sources there. Again the local Community Liaison Group took the information, studied it and came up with suggestions and criticisms that they felt were in the community’s best interest. Community open houses were held and citizens of the municipality were invited to listen to the engineers, view their plans and have the information put into perspective for

them by members of the CLG. Residents were also encouraged by the CLG to air their views and opinions and voice their objections with the knowledge that those views would be passed on and not just passed over. While the cavern concept was not seen through to fruition, it put citizens in the mindset that if there was to be a solution then maybe it would have to be locally driven. But it set us at ease knowing that local, well-versed volunteers were on hand representing us at the big table.

If, in 1976 the federal or municipal government had suggested that Port Hope host its own contaminated waste, the townspeople would have resembled “an orchestra of scorched cats”. The mentality at that time was to “get the waste out of here right now if not sooner”. Trying to sell the idea of hosting a low-level radioactive waste facility to the people of Port Hope in 1976 would have been like trying to get the residents of Three Mile Island warmed up to the idea of hosting another nuclear power plant during melt down. But after twenty years and with no solution at hand, the community of Port Hope was more receptive to the idea. We were growing tired of inaction and for the most part wanted the problem put to bed once and for all. Most residents had grown tired of watching commercial and residential development continually locate in Cobourg as opposed to Port Hope. We knew that Port Hope would never live up to its full economic potential so long as the radioactive waste stigma hung around our collective necks and health issues were still a real concern. Ron Smith’s suggesting in 1996 that the Municipality of Port Hope host a low-level radioactive waste storage facility was much like suggesting to a group just stung by a swarm of bees that they should look after a four-story bee hive for the next five hundred years. Realistically this suggestion could have spelled the end to his political career. But he had developed a reputation as a straight shooter; one of us, not so much a politician as a local boy. He and his municipal counterparts had worked closely with members of the Community Liaison Group, utilising their expertise and taking their “community-driven” advice to heart to come up with a solution. But that solution would frustratingly enough still be two years away.

In 1997 the Township of Hope developed a community-based proposal to construct a long-term facility for wastes stored at the Welcome Waste Management facility. Hope Township representatives were adamant that this facility be used to house only historic waste from within the township’s boundaries. No low-level radioactive waste could be imported from outside the township under any circumstances. This, then, was no solution to the historic waste located within Port Hope’s town boundaries. By 1998, though, the Municipality of the Town of Port Hope had put their own proposal on the table with terms worked out by then Mayor Ron Smith, deputy Mayor Rick Austin and councillors Larry Hall and Aldo D’Agostino. When the proposal was unveiled to the public, it was viewed by many as having the ingredients necessary to solve most of the environmental problems plaguing Port Hope. The proposal, while addressing the LLRW problem also called for the cleanup and storage of toxic wastes from the Chemtron lagoons (another long standing local environmental problem), the centre pier (which would give residents back their waterfront), the harbour, outdated building material located on Cameco property along with materials from other commercially contaminated areas within the town.

Many residents of the community saw this as a good plan that would if completed make for an environmentally pristine Port Hope. Others saw it as a huge mistake to construct a waste management facility so close to a residential neighbourhood. And as always there were questions of environmental impact, facility design, location and safety. It was understood that the final decision would have a definite impact on the community and residents wanted their comments and concerns not only listened to but taken seriously. The municipal negotiating team appointed two members of the now defunct community liaison group to act as community representatives during this new process. Residents Sandy Holmes and John Teilsman through their collective experience on the CLG had become experts on the question of low-level radioactive waste management and both had earned the reputation of working diligently in the best interests of their fellow residents. Because of their work as

community representatives, the questions and concerns voiced by local residents were taken seriously and answered expediently and community input to this project became instrumental to the proposal's success. Their participation was instrumental in garnering public trust and making townspeople believe that the final solution arrived at would take the communities' best interests into account.

In 2001 a legal agreement was signed which commits the federal government and the municipalities to clean up and isolate low-level radioactive waste in above ground mounds designed to last for the next 500 years. For the next five years environmental studies, planning, engineering and public input will help lay out the concepts for LLRW management proposed by the communities. While a final decision has not been reached on the final details of the three low-level radioactive waste management facilities it is important to note that based on past performance, public input and consultation will play an important role in determining the final outcome of this long-standing environmental problem.

CASE STUDY: ADAMS MINE LANDFILL PROPOSAL

L. Oates
City of Toronto, Canada

Introduction

I have been asked to comment on “how to address social concerns” in my capacity as the project manager for the City of Toronto’s Toronto Integrated Solid Waste Resource Management (TIRM) Process, which was initiated in 1997 and concluded in the Fall of 2000. Inherent in this request is the goal of learning from a non-nuclear procurement process in order to offer insights for those working in the field on the short- and long-term management of nuclear waste.

In particular, I have been asked to comment on the learning experience from the proposed engagement of the Adams Mine Landfill that became the focus of an intense four-day debate before Toronto’s City Council and was propelled into international news linked to Toronto’s Olympic bid.

I would like to extend my thanks to Natural Resources Canada for their support of my participation in the NEA Conference. The opinions in this paper are those of the author and not those of the City of Toronto.

Background

The City of Toronto, the former Metropolitan Toronto and the Province of Ontario have been involved to varying degrees with attempts to acquire new solid waste landfill capacity for Toronto and the surrounding Greater Toronto Area since 1986. Numerous planning processes have been attempted but until recently, none have come to fruition. A constant during those numerous planning processes is the Adams Mine Landfill, either as an option under direct consideration or as an alternative to options in which it was not directly considered.

The Adams Mine is located in north-east Ontario, near the Town of Kirkland Lake. The site was mined for iron ore through open-pit mining and was developed in the late 1980s as a potential landfill site by Notre Developments Inc., after the ore body was exhausted. In the late 1990s the Province of Ontario certified the site as a landfill site. However, the site has not been developed as an actual landfill with the required environmental protection infrastructure.

Environmental assessment planning

Toronto’s predecessor, the former Metro Toronto, initiated a formal environmental assessment (EA) of the site in 1995, under the Province of Ontario’s Environmental Assessment Act. As part of that EA, Metro Toronto conducted local and regional public consultation, initiated technical

studies, developed compensation options and mitigative measures including the siting of a local recycling facility to boost the employment opportunities. However, Metro Toronto's Council curtailed that planning process in December 1995 by not renewing an option on the purchase of the mine site. The site owner, Notre, continued with the EA planning process initiated by Metro Toronto and, as noted above, successfully completed the EA and was given regulatory permission to develop the former mine site into a landfill.

Engagement of the marketplace

In 1997, the former Metro Toronto facing the imminent closure of its remaining public sector landfill, the Keele Valley Landfill site, located north of Toronto, began a process of engaging the marketplace through a request for proposals (RFP) process, but continued to proceed under an EA planning process. However, in 1998, the new City of Toronto (created in 1997 through the amalgamation of Metro Toronto and six area municipalities) curtailed the EA planning process and proceeded to directly engage the marketplace through an RFP. Both public and private sector options would be considered, including landfill and incineration.

Submissions were received in late 1999. Two incineration proposals came forward but one was found to be informal because it did not meet the required financial component of the RFP and the second withdrew from the process after it did not attain a willing host status from the local and county governments in which it sought to site a facility. The "willing host" status was not a condition of Toronto's RFP, but was self-imposed by the proponent.

Five landfill proposals came forward. Two were located in Michigan, close to the Canada-U.S. border, and three landfills in Ontario were proposed. Two of the Ontario-based landfills offered only a limited capacity that would only address a small fraction of the projected needs of Toronto and the surrounding Greater Toronto Area over a twenty-year timeframe. The other proposal, the Adams Mine Landfill, offered capacity to address the majority of the projected needs when combined with the Carleton Farms Landfill, located in Michigan.

Adams Mine Landfill debate

Toronto's proposal to contract with the consortium proposing to build and operate the Adams Mine Landfill, known as "Rail Cycle North", became a lightning rod for numerous parties in opposition to the proposal, including a minority of members of Toronto City Council. The opposition groups involved are named below with an accompanying review of their objections.

First Nations: Several aboriginal first nations have identified the Adams Mine within their land claims area (ancestral land areas which are claimed to have not been ceded to the Federal government). Representatives advised that their issues had not been addressed through the EA planning process or subsequently by Notre.

Timiskaming Federation of Farmers: South of the Adams Mine is a farming area in what is known as the "Clay Belt", which is actually the former bed of an ancient sea. The farmers saw only negative repercussions from the creation of the landfill, namely potential contamination of their ground water supply with no offsetting economic benefits.

Provincial and Federal Politicians: A number of politicians from both the Provincial and Federal parliaments took active roles in opposition to the Adams Mine proposal. They cited the opposition of their constituents and concern for long-term environmental impacts.

Northern Municipal Politicians: Politicians from a number of jurisdictions outside of the immediate Adams Mine area voiced their opposition to the project, including numerous municipalities located south of the Adams Mine site who were concerned with potential impacts on ground water.

City Municipal Politicians: A minority of politicians on Toronto City Council opposed the Adams Mine proposal on the grounds that Toronto could achieve a significantly higher diversion rate (including recycling and composting) from landfill.

Mass Media: While members of the media took both pro and con positions, the majority of those commenting on the project gave negative coverage that fuelled opposition to the proposal.

Wilderness Advocates: One group of citizens from Northern Ontario stressed the need to develop eco-tourism as an economic engine in the North, which clashed with the proposal to develop a landfill with a connecting rail line.

Recycling Advocates: Numerous business interests promoted their particular recycling technologies as viable options to the landfill proposal. This gave credence to those seeking higher diversion rates.

North-South Polarization: During the debate over the Adams Mine proposal broader issues linked to north-south socio-economic disparities were raised, given the spectre of waste being transported to the north for landfill followed by active management for one hundred years, in return for the advantage of short-term employment gains, local royalties, and an investment fund. This was portrayed as an example of an ongoing disparity between the north and south in Ontario.

Many of the concerns raised by stakeholder groups had been addressed. Rail Cycle North's proposal offered Toronto a no-put-or-pay option, which meant that Toronto could shift tonnage from disposal to recycling without financial penalty. The mine owner, Notre, had as previously noted successfully completed an EA. The Minister of the Environment had been satisfied that traditional nuisance impacts such as odour, noise and vectors, had been satisfactorily addressed and only the question of the computer modeling of the "hydraulic trap" feature of the site should be subjected to review through an EA hearing. This led to the charge that a full EA had not been performed.

Against the backdrop of opposition was support from the three local municipalities of Kirkland Lake, Larder Lake, and Englehart, which would benefit from employment opportunities and financial income in the form of royalties.

All of the above-noted stakeholder opinions and positions became magnified and focussed as Toronto's City Council proceeded to consider adoption of a draft contract with Rail Cycle North. While the draft contract was adopted, it was not executed, as Rail Cycle North could not meet a series of additional conditions set by Toronto in the timeframe provided. As a result, Toronto has turned to its contract with Republic Services (Carlton Farms Landfill) to address its residual solid waste disposal needs and renewed its diversion commitments by establishing a 100% diversion rate from landfill by 2010.

Can disentanglement be achieved?

What can be learnt from Toronto's experience? Toronto sought to disentangle itself from the EA planning process and the incumbent need to address stakeholder claims and concerns by entering into a service for fee contract with a service provider but could not do so. This is primarily because opponents of the Adams Mine proposal recognised that the construction of the site was predicated on Rail Cycle North reaching a successful contract with one or more major municipalities in order to justify construction and, in turn, underpin the required financing.

Therefore, the debate over the proposed Toronto City Council approval of a contract with Rail Cycle North became a critical juncture for the proposal opponents.

Summary

In summary, the following points are offered as reflections on the Toronto experience and point to ways to build confidence in a project proposal:

- Long-term commitment on the part of one or more governments is required to demonstrate the ability to ensure long-term environmental care and the availability of financial resources to underpin the process.
- Ensure that all components of an EA (such as the Adams Mine EA) come under review in a hearing in order to ensure and demonstrate complete and thorough review.
- Provide for a long-term monitoring process that includes a role for local interests.
- Listen to the project opposition, as they will “set the bar” for the type and level of environmental safety and procedures that must be met above and beyond that stipulated by regulatory authorities.
- “Hug the opposition.” Ensure that you keep an open mind to the positions of your opponents and encourage co-operative problem solving.
- Demonstrate sustainable development by demonstrating front-end conservation measures such as recycling (in the case of solid waste) and energy conservation (in the case of nuclear-based energy generation).
- Foster broad-based buy-in on the project's planning principles.
- Utilize all of the “tools” in your toolbox, including mediation and other conflict resolution techniques.
- Identify a project spokesperson to provide a “window” to the project for the public and media.
- Demonstrate the safety of the project.
- Where possible, link national goals to local concerns.
- Provide resources to opposition groups in the form of funding to provide for third-party research and critical review.
- Engage in broad-based planning that includes a status quo option and the associated pros and cons.

OBSERVATIONS ON STAKEHOLDER CONFIDENCE RELATED TO URANIUM MINE WASTE MANAGEMENT IN THE ELLIOT LAKE REGION

G. MacDonald

Representing the Township of the North Shore
and the Standing Environmental Committee of the Serpent River Watershed, Canada

I am a stakeholder. I live in the Serpent River watershed downstream from 175 million tonnes of acid-generating and radioactive uranium mine tailings.

You have asked me to provide you with some insight and advice to identify, address or ameliorate the social concerns that influence public confidence in nuclear waste management. My observations and comments are based on a variety of work and volunteer experiences related to uranium mining and waste management.

“The effective management of radioactive waste requires the public to have confidence that activities are being conducted in its best interest.” In the absence of any definitive studies or information about public confidence in the Elliot Lake area, e.g., stakeholder surveys, I believe that the level of public confidence in the Elliot Lake region is influenced by what is remembered from past interaction with other stakeholders.

Some of the issues connected with mining that the people of the area remember are: concerns about the health of workers, radon in homes, the impact of early waste management practices on the watershed and fisheries, difficulties in obtaining compensation for workers, the need to filter radium from drinking water in the town of Serpent River, drinking water standards for the people of the Serpent River First Nation, spills and fish kills, shooting thorium barrels, studies of radium uptake in fish, moose meat, and baby teeth, storage of PCB's, cancer deaths, and loss of land use.

Other local issues (indirectly related to uranium mining) include: the Cutler acid plant waste (Serpent River First Nation), drilling for a high level waste repository at East Bull Lake (Massey), shipping MOX fuel by air (Sault Ste. Marie) and the accidental discharge of trioxide refinery waste into the environment (Mississagi First Nation, Blind River).

Other general issues that have influenced public confidence, and more importantly may impede the ability of citizens to develop confidence in the actions of other stakeholders in the future include:

- the failure of governments to set aside funds, e.g., from a percentage of operating profits, for post-operations use that can be accessed by community members (for environmental monitoring, research and emergency purposes);
- failure to enact 1996 CEAA FEARO (Kirkwood) panel recommendations related to the involvement of citizens in mine waste decommissioning decisions.

There are two types, or sources, of public confidence: public confidence in the ability of others to act in your best interest, and confidence in your own ability to act in your best interests. In 45 years of mining in the Elliot Lake region, there have been few actions that have resulted in the development of either type of public confidence. There have also been many occasions in the past for interaction between the public, industry, government, and the scientific community. Neither the issues noted above, nor the experiences ‘at the table’ as a member of an advisory committee have resulted in any significant or lasting improvement in the matter of stakeholder confidence from the public perspective.

Brief history of public involvement in mine waste management

Prior to the recent mine closures, only two public environmental monitoring committees were organised during forty-five years of mining in the Elliot Lake area. They operated for a relatively short time and had a restricted focus.

- A group of citizens concerned about the Dunlop Lake watershed operated an Environmental Committee for a brief period in Elliot Lake following the Uranium Mine Expansion Hearings in 1977.
- A Lake Lauzon Citizens Committee was formed in that watershed in the 1980s as a result of concerns about possible placement of acid contaminated soil waste from the Cutler Acid Plant on the Pronto Tailings.

During the decommissioning and closing of uranium mines in the Elliot Lake region the public were invited to participate in CEEA hearings concerning the long-term waste management proposals by Rio Algom & Denison Mines.

The FEARO/CEEA report of The Environmental Assessment Panel entitled, “Decommissioning of Uranium Mining Tailings Management Areas in The Elliot Lake Area”, published in June 1996, gave hope to members of the public that recommendations to government concerning the establishment of “a not-for-profit corporation which might be named the Serpent River Basin Conservation Council” would be followed. Unfortunately, the Government of Canada response, and events subsequent to those hearings did not support this recommendation.

In 1998, however, Rio Algom Limited commissioned Laurentian University staff in Elliot Lake to complete a survey of (selected) community members to give direction to their public information programs.

Shortly thereafter, a community-based Decommissioning Review and Advisory Committee (DRAC), was formed by Rio Algom Limited to review the Company’s closure plans and make recommendations related to environmental issues and decommissioning activities. After meeting for a two-year period, the committee members became convinced that an independent organisation with a broader mandate and scope of activities would have a more credible and useful presence in the community.

The concept of a standing committee of councils was (once again) proposed in a Community Forum in May 2000. Representatives of federal and provincial governments, the mining companies, the monitoring agencies, steelworkers, businesses, residents and politicians from the communities in the Serpent River Watershed attended.

Eventually, due to the determination of the committee members and chair, the Councils of the 3 communities in the Serpent River Watershed (Elliot Lake, Township of the North Shore and the Serpent River First Nation) supported the creation of a Standing Environmental Committee (SEC), with each community appointing 2 members.

Another year passed before the actual appointment of members took place. The first meeting of the SEC took place on September 26, 2001.

The SEC – Will we succeed?

During this first year we have reviewed and revised our mission and mandate and are developing a strategic plan that we trust will be supported by our elected representatives.

It is a work in progress. As volunteers with very limited resources, we know we have to seek not-for-profit status in order to secure funding to hire staff to complete the work of the committee.

Our work-plan includes involving local citizens at every opportunity – for example by:

- lobbying to re-instate public tours of WMA's;
- developing a repository of waste management information;
- promoting development of research programs that engage local residents;
- organising scientific conferences and workshops on waste management technology.

Our committee is also interested in participating on behalf of the public and elected leaders in Joint Review Group (JRG) site tours and de-briefing sessions. We believe that by being proactive in all aspects of tailings management and public awareness, the overall objectives of regulators, of mining companies, and of government authorities responsible for human and environmental health will be met.

Since the closure of the uranium mines, the people of the region have had a new set of challenges to deal with, the most important of which is the task of creating a stable economic base. We not only recognise the potential for development opportunities related to mine waste management (research, technology) but also, and maybe more importantly, we recognise the risk to all other ventures – retirement living, cottage development, eco-tourism, tourism, etc. that depend on a relatively pristine environment – if there is any real or perceived threat to the environment.

Recent challenges to ensuring public confidence

I believe the following factors have or will contribute to the loss of local knowledge and in turn to greater loss of confidence.

- Loss of mining company staff and expertise.
- Loss of former industry workers (relocating or death).
- Loss of scientific community e.g., CAIRS, Can-Met lab and reduction of staff at Laurentian University Research Field Station.
- Use of remote monitoring technology that replaces 'in person' inspections.

- Changes in population demographics and focus of activities e.g., Retirement Living, tourism, eco-tourism, and cottage development.
- Changes of land use e.g., increased camping, hiking trails, wildlife sanctuary, use of ATV's on former mine sites.
- Inability of local people to recognize and respond appropriately to deteriorating environmental conditions.
- Absentee regulators.
- Infrequent and unpublicized inspections by regulators.
- Complicated and poorly understood 'financial assurances' agreements.
- Production of highly technical, detailed, and voluminous reports by mining companies.
- Inability to conduct independent research, to access independent expertise.
- Regional competition for limited financial resources, failure to achieve self-sufficiency or true economic diversity.

So, in answer to the questions posed by NRCan in inviting me:

1. Has the work of this independent group helped build confidence in the community and alleviate concerns that the decommissioned uranium mine and mill sites are not causing any undue harm to the environment and the people?

In a word, NO. It is too early in the process for our committee to have had any influence in building confidence in the community. The mining companies Rio Algom and Denison have remnants of staff in Elliot Lake, and the companies, or their contracted employees, have both the means and the responsibility to respond to enquiries concerning waste management issues. It is the intention of the committee (as listed in its mission, mandate, and strategic plan) to build confidence by ensuring access to information, by organizing public meetings, developing educational programs, and by maintaining ongoing dialogue with industry, regulators and the scientific community. We have no human or financial resource tools (yet) to carry out our work-plan.

2. How does the committee ensure that the results of its work are made known to the public?

Initially, we contacted all known outside and community stakeholder groups to advise them of our formation. Our committee members provide written and oral reports to their respective council. Press releases are of little use. Our intention is to develop wider awareness as outlined in our work-plan.

3. At what point in time do you determine that sufficient public confidence has been gained and the monitoring committee can terminate its activities?

There is no walk away option for the public. We are, at the very least, responsible for informing two generations of the potential hazards associated with wastes. We still do not have even the simplest things like enduring signs on the WMA's. Mining companies are hopeful that in 50 years, the effluent treatment plants will not be needed and a stable state will have been reached with submerged tailings. Thus the ability to engage the public will become even more important in 10, 20 and 30 years, and beyond.

4. What advice would you give to a community wishing to set up a similar monitoring group?
- Deal with the waste before it is produced.
 - Make sure everyone fully understands important issues like financial assurances.
 - Appreciate the integrity of individuals – no matter what their label says: staff, politicians, environmentalist, government bureaucrats, scientist or industry workers.
 - Know why you're at the table, know who is paying the tab at all times (and who should be), and know what resources you have (no assumptions).
 - Be prepared to commit significant personal time to the effort.

TRUST, RISK AND THE MEDIA

K. O'Hara

Associate Professor, School of Journalism and Communication, Carleton University, Canada

This past weekend an item appeared in the Sunday *New York Times* about the word nuclear and the tendency some people have to mispronounce it.¹ Some people include the President of the United States, George W. Bush who says *noo kuy lhar*. He is in good company. Four other American presidents also favoured this pronunciation, including Jimmy Carter who had previously worked in the field of nuclear physics.

This is such a contentious word that the American Heritage dictionary has a form letter prepared for the onslaught of complaints they receive every time a nuclear issue comes to the fore, as it has recently with the case of rogue nations having nuclear capabilities. More often than not people complain about the fact that the mispronunciation is so common place and confident.

Nuclear is, all by itself, a loaded word, notwithstanding the associations that tag along with it.

One dictionary maker² quoted in the *Times* article states it succinctly:

“If we are so upset about *noo-kyul-luhr* proliferation, we can only hope that technology will come up with a new source of energy that we can all pronounce.”

This summer, we dropped anchor near the nuclear plant and wind generator in Pickering. I enjoyed the view and the idea of clean interconnected sources of energy. When I told my friends, they reacted differently. Nuclear plant: deformed fish, glowing water, contamination.

Which is all to say that for me, dealing with the issue of nuclear waste comes with a load of baggage. The word itself, which has been in the public domain for the last sixty years or so, is laden with controversy and concern. That is simply the word, a descriptive adjective. But it signifies to me the emotional ambivalence underlining the public view of nuclear stuff, good and bad, even before we examine substantive issues and where we are going with the topics that concern us here today.

This is an interesting element of trust building and public perception. And as I have come to understand media and the public, perception is nine-tenths of the law.

I want to talk about trust and some of the things we have learned about conditions and criteria for trustworthiness, a subject that is central to what I believe we are dealing with today. (It is

-
1. “Confronting NOO-kyuh-luhr proliferation” is an amusing account written by Jesse Sheidlower, the principal editor of the Oxford English Dictionary’s North American Unit.
 2. Enid Pearsons, the former pronunciation editor at Random House.

integral to much of what we are trying to build into a Science-Technology-Society interface, although even that terminology sounds dated.)

Nuclear energy and waste management is not a subject I have been familiar with for many years. It has not had much media attention in Canada until very recently with the passage of the new act. So I do want to thank my colleagues at Carleton who have written a book that quickly gets one up to speed on the issues in Canada, at least.³

From my perspective, there are risk factors that have been enumerated and evaluated by a variety of capable scholars in what has become a growing and increasingly fertile field of communications. I am not one of those scholars but I rely on my old journalistic instincts to find a short route to available, solid research.⁴

Research has been performed about a community's sense of being at risk and how the community assesses that risk. Perceived risk characteristics influence whether people will find them acceptable or not.

1. First of all, is the risk involuntary or voluntary? I may choose to sky dive at considerable risk to my health but it is my choice. A nuclear power plant in my neighbourhood or the disposal of nuclear waste is not.
2. Inequitably distributed: In the case of nuclear waste certain communities shoulder all the responsibility while others who use nuclear power, for instance, have access to the technology with no accompanying problems.
3. Inescapable.
4. Unfamiliar or novel.
5. Man-made rather than natural.
6. Hidden and irreversible.
7. Danger to kids, pregnant moms, future generations: This one resonates particularly hard when it comes to exposure to nuclear products and the mind-boggling longevity of nuclear waste.
8. Identifiable.
9. Poorly understood by science.
10. Contradictory statements.

Nuclear energy and the disposal of nuclear wastes score high up on the scale. Certainly 1, 2, 3, 6,7, and to a degree 9 all factor into public's perception of the kind of risk nuclear waste disposal presents in an otherwise lucid argument for clean energy.

After considering risk factors, it is interesting to note that scientists in dealing with the public have in the past not trusted the public to have opinions about science and in particular its offspring, technology. Fortunately this idea that the public has "emotional" reactions to risk in new technology rather than rational ones is far less prevalent than once it was. In current social studies research, the

3. *Canadian Nuclear Energy Policy: Changing Ideas, Institutions and Interests*, edited by G. Bruce Doern, Arsian Dorman and Robert W. Morrison. Toronto: University of Toronto Press, 2000.

4. For instance, *The Perception of Risk*, by Paul Slovic. London: Earthscan, 2000.

idea that the public is capable of asking relevant and intelligent questions about risk is front and center.

Brian Wynne is a professor of science studies and the Research Director of the Center for the Study of Environmental Change at Lancaster University. He has published several books and papers on risk issues, specialising on research and reflection on the interaction between scientific knowledge, public policy and public responses in policy domains involving risk. In his presentation at the Science and Society Conference sponsored by the European Molecular Biology Lab in Heidelberg in November 2000, *Why framing processes in risk science are important but still neglected*, he made the point that “facts first – values second” model of risk assessment overlooks two crucial problems:

- The uncertainty factor. Scientific knowledge is not usually so free of uncertainties that it can determine clear policy conclusions.
- Scientific knowledge is framed by subtle assumptions that are not usually visible or explicit even to the authors and these are often unintentionally political.

The following is an excerpt from interview I did with Brian Wynne concerning shortcomings in the framing procedures. Recorded in Heidelberg, Germany, Nov. 9. 2000.

Question: *In this current dialogue, how is risk portrayed?*

Answer

“With a great deal of confusion. People are talking past each other about what they actually mean when they use the word risk. As a scientist when you actually do a risk analysis, you choose endpoints, certain kinds of risk or harm or benefits you are analysing for. You do an analysis of impacts: environmental, health and so on. This very process makes an assumption about what has value. Quite often the unit of risk in scientific terms takes human death as the only endpoint that is effectively valued. Other kinds of potential harm are devalued or non-valued. This fortunately is not the case in [genetically modified organisms, for instance]. But the same kind of thinking applies to environmental risk assessment. Certain end points are picked out and others excluded and that defines the risk. Concerns that people have about the impact of our control over the food chain globally or disease control or the impact of monocultures, are nowhere to be seen in the risk assessment carried out by scientists in the Euro-barometer surveys or in biotech research (...).

“The lack of awareness and lack of explicitness is what is running the science into trouble...with the public trust and public confidence. The necessary further step...which would only have positive consequences for scientists in the public domain ... is for scientists to learn how to be more explicit about what they have to say, about what they have to offer to the public policy world... the public policy world can then define better what the questions are for public policy commitment.

“That is, rather than scientists asking the question on risk which is perfectly necessary to ask but it is not the only question, we can then ask the further question to “what are the risks”.... And that is, “what about the things that we haven’t actually seen, the unforeseen consequences”.

“Is there a plan B for the uncertainties?” (end of excerpt).

In one study, people wanted to know what plans are in place if something does go amiss. What is Plan B, for instance, and if science does not have a plan B then what is the rush and who is benefiting from expediting the singular plan A? This is good, grown-up thinking.

It is not necessarily science literacy. In fact, people don't have to do science or even understand scientific method to have a valid opinion about their own perceptions of risk and risk to their society.

However, if people were a little savvier when it comes to science we would be better equipped to participate in a conversation about choices. In much-cited biennial studies from the National Science Foundation in the US, half the Americans surveyed four years ago were not at all sure how long it takes the earth to go around the sun, even when given a multiple choice of a year, a week, a day. This has improved. The latest survey results from 2002 show 54% getting the answer right. (A year!)

Likewise nearly a half thought all radioactivity was man made. More disturbing was the fact that 30% thought that reported objects in the sky are really space vehicles from other civilisations. This is not to denigrate the public and that survey only covered 1 574 adult members of the public. If we are to have public consultation we need to accommodate the range of decision making possibilities people present.

But it is somewhat discouraging when science methodology and basic facts remain such a mystery and people are putting more faith in pseudo-science (Canadians fare a little better than their U.S. counterparts in these surveys but not much).

Nonetheless, other surveys show that people tend to trust scientists and are interested in knowing more about science, especially when it relates to health. When I say that people tend to trust scientists, they do, relatively speaking. I first saw this trust scale seven years ago in a presentation by the British Medical Council. First on the list were:

- family and friends;
- then came doctors followed by;
- pressure groups, perceived as altruistic;
- scientists are generally thought to be trustworthy and then in descending order;
- unions;
- religious organisations;
- business;
- government and politicians;
- public relations specialists and finally;
- the media.

Doctors and scientists are still high up in the trust scale. A survey last year by the British Medical Association, still has ordered the professions in much the same way.

One doctor I talked to recently, said that although his patients might trust him, they do not necessarily trust what he tells them and in fact he feels he has as much credibility at times with them as the guy who runs the health food store.

Biz, law, politicians, and media still seem to be bottom-feeders in the trust category.

The media has a tougher row to hoe. When it comes to reporting on controversies in science often the media are caught between a rock and a hard place. There is a tendency in journalism to go for the dramatic, the more sensational story. We are after all storytellers, and witnesses. We are definitely not in the business of peer review evaluation. We trust the scientists to do their work. When scientists disagree as they often do, traditional journalism will tend to build up the disagreement. The old 'he said, she said' argument. This confuses the public.

Many producers and editors don't have science backgrounds, most in fact.

The reaction to complex stories is simply not to run them or to run them simply.

I am happy to say that this is changing. More journalism schools are turning out men and women who are specialising in science. For some, this means doing journalism after getting a degree in science, for others it means understanding what science is all about and then writing and reporting on it. We have room for both.

There is no proof that a scientist makes a better science journalist than does a well-trained journalist with a penchant for science. What does make a difference is the fact that these people will be taking up more space in the media and will be better able to report on science in general and controversial science in particular. And in a parallel move, more scientists are being urged to develop media skills and talk to the public and to the media. This can only improve understanding and mutual trust.

And on that optimistic note, I will stop.

HOW TO ADDRESS SOCIAL CONCERNS? ROUND TABLE DISCUSSIONS DURING SESSION II OF THE FSC WORKSHOP IN CANADA

J. Kotra

U.S. Nuclear Regulatory Commission

Introduction

All of the round table discussion groups recognised that a variety of tools exist for addressing social concerns. Among them are tools for sharing information and specific programs offering compensations, financial and otherwise. Institutional behaviors, both general and specific, may also be modified to respond to social concerns. However, many discussants emphasised that social concerns and effective solutions for them, when they exist, are highly site- and community-specific. Only when the sources or origins of site-specific concerns have been identified may the selection of tools be approached.

Specific sources of concerns seen in the Canadian case studies were discussed, as well as examples from other countries and programs. All involved the absence or erosion of trust. A deficit of trust may arise from lack of familiarity, misinformation or missing information, changing sensibilities of society over time, specific past failures of particular institutions, or inadequate general education. Virtually all of the tools discussed by the round tables for addressing social concerns were also means for building – or rebuilding – social trust.

Question 1: What kinds of concerns are best addressed by economic solutions? Other types of solution? What about the needs of future generations?

Regardless of whether an economic solution or other mitigation measures are chosen, most of the round tables observed that *process* is as important as the particular solution applied. The fairness, integrity and transparency of process must be well worked out.

Specific observations about application of economic solutions included:

- Economic solutions work for many of the social concerns identified, but safety is not to be bought.
- Moneys should not be distributed indiscriminately. They should not be treated as financial incentives but instead should be linked to specific compensation issues. The aim should be an enduring development plan for the community that includes, but is not limited to the facility.
- Financial compensations provided to one community can, and on at least one occasion in Canada did, create competition and conflict. Failure to address needs and concerns of

adjacent or neighboring communities is a risk if the target audience for compensations is drawn too narrowly.

- If brought too early in the process, discussions of economic arrangements may “taint” the credibility of assertions about safety, environmental, and even economic impacts.
- A sound, accountable infrastructure, under the control of a neutral party, is desirable to administer the distribution of funding and compensation.
- With regard to the needs of future generations, consideration should be given to providing funding mechanisms/devices that will ensure resources for long-term monitoring as well as unforeseen repair and/or remediation.

Question 2: Are there opportunities for public participation throughout the project lifetime? How are national and local processes, roles and powers articulated? Is balance achieved between local needs and national imperatives?

Most workshop participants agreed that Canada’s Environmental Impact Assessment (EIA) process gives the opportunity for public consultation throughout the project lifetime, both nationwide (for choosing an option) and with affected communities (for defining acceptable concept, siting and design). This is both necessary and appropriate. Distinct regional and cultural differences could be discerned with differing social values and concerns (e.g., Aboriginal peoples, Northern provinces, more industrialised Southern provinces, etc.). Communities in regions of very low population density face special challenges when attempting to coordinate with others wishing to raise similar social concerns.

Question 3: Are concerned citizens and communities satisfied that they are treated in an equitable matter? What are the views of neighboring communities? Of special interest groups?

By and large, most round tables recognised that communities facing disposal of radioactive waste, or location of other undesirable facilities, approach any consultation with strong concerns that they have not and are not being treated equitably. Organisations should recognise from the outset that communities may well perceive that they have not been treated equally. Often richer communities have more influence than less advantaged ones. Trust is all the harder to build in communities that (for reasons perhaps unrelated to a proposed action) already feel marginalised and less informed. For these reasons, all of the discussion groups identified continuity and integrity of process as paramount in importance. Also noted was the value of involving “unaffected” neighboring communities in dialogue to create witnesses of credible behavior.

In cases where risks were neither immediate or large, stigma and the economic impact of that stigma were seen as driving factors, as well as concerns about future generations and concern or fear that government or industry may not be there for the long-term. While stigma may not be permanent, when communities are experiencing the rejection and measuring the losses, responsible institutions cannot just say “give it time.” The very real problems resulting from such perceptions must be addressed in real time, or feelings of inequity may become exacerbated. Likewise, addressing forthrightly concerns about potential losses of property value and other economic losses is a powerful demonstration that institutions are listening to and responsive to issues that matter to local communities.

Question 4: Can any impacts on social trust be observed at this time?

As noted above, the importance of trust, establishing it, rebuilding it, enhancing it, and retaining it animated most of the discussions during this session. Among the many observations noted by the various round tables were:

- Social trust takes time and is built upon relationships. Trust is hard to build and easy to lose.
- Trust can be built on ignorance, but then is less robust, over the long term, than trust founded on knowledge and understanding.
- Trust built on knowledge requires a process of informing people and may, at least initially, decrease trust.
- Institutions that declare their interests and their motivations up front and openly are more trusted.
- “Triple bottom line reporting”, where corporations not only report their financial transactions but also ascribe monetary value to environmental and social costs and benefits incurred by their activity, is improving behavior of organizations and increasing trust. Although driven by monetary concern, the reputation of corporations is getting more scrutiny and corporations understand that the public perceptions that emerge, for better or for worse, do affect their profits.
- It is difficult to trust organizations if people do not understand who the players are and their respective roles.
- Information, education takes time, and past history, for better or worse, plays a role in a community’s willingness to trust.
- Locally-driven solutions are more likely to be trusted by the local communities.

Question 5: What changes may be required in the managing organizations to address or resolve social concerns?

Virtually all of the round tables acknowledged that addressing social concerns requires commitment of adequate resources. That is, resources to provide for safety, resources for monitoring, resources for early, frequent and long-term consultation and information exchange with affected communities, resources for appropriate compensation and resources for visible and long-term involvement, both with the project and with the community. Integrity of process is also essential. This means that commitments must be fulfilled and legal agreements honored.

Specific observations included:

- Top management must meet with local communities regularly.
- Those in authority must be accessible.
- Government, regulators, implementers all must recognize that social concerns are important and commit resources to address them.
- Organizations must reach out to identify concerns directly and address the concerns as they find them

- Organizations should cultivate a reputation as a responsible and honest neighbor by reporting all operating incidents honestly and in a timely manner.
- Organizations should work to establish a history of providing balanced, credible information
- Organizations must demonstrate long-term commitment to safety.
- Institutions should be pro-active in identifying issues and concerns.
- Managing organizations should recognize that addressing social concerns is not the same as “community relations.”
- Proving resources for communities to obtain independent expertise can help mitigate concerns. In some contexts the public is satisfied with the regulator as the provider of this independence. In others, additional expertise, independent of both the implementer and the regulator is desired.
- Expertise must be credible and, ideally, free of an agenda. If an agenda exists, it must be stated.
- Adequate funding must be provided to ensure independence.
- Information policy should involve individuals who are part of and respected by the community.
- Managing organizations should take the time to explore solutions with the public on a step-wise basis.
- Managing organizations should explain clearly the roles and responsibilities of the various players at each step and overall.
- Always have a “Plan B” to demonstrate that responsible organizations recognize that things can go wrong.
- Involve local opinion leaders to both formulate solutions and implement them.
- Create a formal, but flexible structure for the relationship between the implementer and the community.

To be most effective in addressing social concerns, organisations need to become: more adaptable to change, more open minded, willing to embrace social sciences as part of the decision making processes. Ultimately, they may have to accept that, when it comes to addressing social concerns, institutions are not in full control of process – they may need to be willing to give up some measure of control in exchange for greater social trust and acceptance.

SESSION III

Development Opportunities for Communities

Chair: T. Merceron

Andra

Moderator: E. Atherton

Nirex

DEVELOPMENT OPPORTUNITIES FOR COMMUNITIES: THE PORT HOPE AREA INITIATIVE

R. Austin

Mayor, Municipality of Port Hope, Canada

Good afternoon ladies and gentlemen. My name is Rick Austin and I am the current Mayor of the Municipality of Port Hope. I was born in Port Hope, educated there and I have been a Councillor in that community since 1988. Over the period of my political career, apart from being Mayor, I have chaired every municipal committee in that municipality of roughly 16 000 people and have also chaired the local Port Hope Police Services Board. I have a solid grasp of my community and the issues that affect it and it is my interest to ensure that it remains the thriving, friendly, and beautiful community that it currently is.

In this regard, I was very pleased to have this opportunity to talk to you today about my community and how we have moved forward to deal with an issue that has generally been characterised as an environmental. We have turned a problem into a development opportunity for Port Hope that will have lasting benefits for its citizens.

I am going to briefly describe the nature of the problem that exists and our approach to resolution; you have already seen a video¹ on the issue and some of you took the opportunity to visit the municipality on Monday, so I will not spend much time on these aspects. What I really want to emphasise is how we expect the challenge of dealing with this long-standing problem will result in both short- and long-term economic and other benefits for the community.

The municipality has been dealing with the issue of low-level radioactive waste contamination since the mid-1970s, that is when the problem of mismanagement of the wastes was first discovered. There was a major cleanup effort in the late 1970s that remedied the most urgent situation, but the cleanup still left large volumes of waste and associated contaminated soil that needed a long-term solution. The municipality has laboured with that reality over the last roughly 30 years. The impacts have been real. We have seen neighbouring municipalities attract commercial and industrial investment that had been destined for Port Hope but relocated on the basis of the radioactive waste problem. Similarly, we have seen residential development avoid Port Hope in favour of neighbouring municipalities. These are just the opportunities of which we are aware. I am sure that there are many opportunities that we were never aware of and untold numbers of residents who decided to locate in other communities because of the existence of radioactive waste contamination. The issue has been well-broadcast not only in our own local newspapers but also in the national media – the Globe and Mail, the Toronto Star, and CBC and CTV national broadcasts at various times. And,

1. A brief video produced for the Port Hope Initiative was projected at the beginning of the session. It featured quotes by residents on the Port Hope situation before and after the arrival of the Initiative and some technical information on the waste issues and epidemiological findings.

of course, this kind of information and publicity has an impact on the public's perception of the community.

The waste problem also has had a major impact on the way we do business in Port Hope. Municipal developments and works must go through an additional level of scrutiny that increases the workload of all municipal departments and municipal staff must deal with public inquiries on contamination issues on a regular basis.

But, I think we have turned the corner on all this now. Did we have a problem – yes – but now we have a solution. That solution is represented in the process established by the Legal Agreement we signed with the Minister of Natural Resources and we are moving forward on it. It is a solution that will not only clean up the municipality but will bring both short-term and long-term benefits to the municipality as well.

We have already seen a lot of the short-term benefits realised in the community. First, on signing the Legal Agreement with the Government of Canada, each of the signatory municipalities received a \$10 million grant referred to as a host community fee. The fee is designed for the municipalities to address, as they see fit, impacts associated with the presence of long-term waste management facilities within their communities. In Port Hope's case, these funds have been placed in a trust and are earning interest that is available to Council to use as it sees fit in the community. The principal will stay in the trust until the Project is permitted to proceed by the regulatory bodies.

Over the course of the next 10 years, Project costs are estimated to be roughly \$230 million (year 2000 dollar value) of which we hope to capture a significant percentage in the economies of the local communities. We have already begun seeing the benefits of the Project in terms of new investment and expenditures in the municipality even now in the planning stage. The proponent for the Project has opened three new local offices to implement the Project and hired additional staff – many from Port Hope itself. In addition, we have already seen the impacts of increased business travel to Port Hope relating to the Project through an increase in overnight stays in the municipality by consultants and other stakeholders – many of you contributed to this on Monday night – increased expenditures at local restaurants, and some increased housing demand; not just in Port Hope but also in the west end of the Country.

Once work actually begins, we will be seeing the employment and expenditure increases associated with undertaking a large capital works project involving the movement of half-a-million cubic metres of material. Also associated with this will be employment relating to the restoration of remediated lands, roads, and building. In addition, there will be increased technical support jobs to verify and monitor that the work is being carried out properly. Many of these benefits will be realised by local residents and business.

At the same time, we should not underestimate the impact of the actual work. The cleanup and construction phase of the Initiative could last upwards of 6 years. During this time, there will be impacts associated with noise, dust, road construction, and other inconveniences. We are determined that the proponent put in place measures to mitigate these impacts, but at the end of the day we realize that there will be some residual impacts that can not be mitigated. Our view, however, is that the short- and long-term benefits of the Project will far outweigh any such impacts.

As for the long-term benefits, first and foremost, our community will be cleaned up and properties will be available for unrestricted foreseeable uses. This will extend to not only the radioactive contamination, but also certain non-radioactive historic industrial properties that were included as part of the Legal Agreement.

The cleanup will act also as a catalyst for municipal development with major economic spin-offs and impacts on the local quality of life. In particular, the municipality can undertake new and exciting waterfront development of our beautiful lakeshore. Our Harbour will be restored and the municipality's centre pier, a prime location in the municipality and now contaminated, will be remediated and available for future recreational use. Significant portions of the existing Cameco property, which also occupies the waterfront, will be decommissioned providing us with many potential development opportunities. Port Hope is already a weekend tourist destination for Ontario residents and a redeveloped waterfront will only enhance its attractiveness to tourists but provide recreational opportunities for local residents as well.

At a more fundamental level, however, the actual excavation of streets, roads, and other public areas will result in renewed municipal infrastructure. In addition, the hauling of waste and construction materials will likely require other municipal transportation improvements. We will be working with the proponent to ensure that our own municipal works agenda is coordinated with the Project implementation plan to exploit any synergies that may exist.

Key to the success of this initiative so far has been the fact that the proposals for resolving the problem are community-driven. The concepts that are being evaluated by the proponent were generated by local committees mandated by their respective municipal councils to investigate options for the long-term management of the local contamination. An important element of the conceptual proposals put forward by the committees was that the eventual long-term management facilities should be engineered such that they could be used for active and passive recreation. This element has been incorporated into the conceptual designs of each of the proposed facilities with such features as walking trails and playing fields. The intent here was to de-stigmatise the waste issue – to demonstrate that waste could be accommodated safely in the community without the negative visual impacts and isolation of large tracts of land from public use. We will be working with the proponent to try to realise this objective. Our success in this regard will result in important recreation assets for the community.

We also hope to take advantage of the educational potential of the long-term waste management facilities and the cleanup generally. The proponent already has been active in the local schools explaining the Initiative to students and teachers and answering their questions. We hope that this information yields interest in our schools and among our students to examine the issue, get involved in the Project, and perhaps, in the long run foster greater local interest in the physical sciences and engineering among our youth. In addition, we anticipate that the Project will also attract interest among those dealing with similar projects nationally and internationally. Experts will come to Port Hope to see how we dealt with the problem and turned it into an opportunity for the community.

That leads me to a final lasting benefit of the Initiative and that relates to the perception of the community among both the local citizenry as well as people from outside the area. As I mentioned at the beginning of my talk, over the last roughly 30 years many have perceived Port Hope as a community with an environmental problem – a town that “glows in the dark”. We believe that this initiative will put that notion to bed once and for all and, what's more, it will replace that perception with one of a forward-looking, progressive community that decided to do something about the issue, move forward, and turn what had been a problem into an opportunity. That new perception will further impact investment and development and make residents feel even better about the community they live in.

In conclusion, I'm very optimistic about the future. We have been working at the issue a long time – since 1976. The Legal Agreement is now concrete evidence of the commitment of all parties to deal with problem in a responsible fashion. In addition, and very significantly, the

Agreement is backed up by a lot of good will among the parties and a cooperative spirit to get things done. We, in the Port Hope area, have a lot to gain through this Initiative – development opportunities, a new perception of confidence, and a remediated and restored community. To quote the title from one of the many reports written during the long history of this issue – I think I speak for the majority of local residents when I say, “Let’s Get on With It”.

Thank you.

DEVELOPMENT OPPORTUNITIES FOR COMMUNITIES: A POINT OF VIEW FROM THE CANADIAN ASSOCIATION OF NUCLEAR HOST COMMUNITIES

L. Kraemer

Chairperson, Canadian Association for Nuclear Host Communities, Canada

(presentation outline)

At times, policy development can be taken to great heights. However, it is the implicit intention of this speaker to bring forward the grass roots ideals of the community with respect to the important societal issue of the management of nuclear material.

With his dual roles of Chairperson of the Canadian Association of Nuclear Host Communities (CANHC) as well as that of the Mayor of Kincardine, Larry Kramer will outline the factors that resulted in the birth of the CANHC along with the goals and objectives of this newly formed, Canada-wide organisation.

Insights into the expectations of member communities with respect to the changing landscape of both the new competitive energy market in Ontario and legislative resolution (Federal Bill C-27), along with the issue of the management of spent nuclear fuel, will be addressed.

To enhance the understanding of the CANHC's member communities, Mr. Kramer will review the nuclear attributes of the Association's members in order to generate an awareness of the need for these communities to come together to engage not only the nuclear industry, but both levels of government as well, in a public dialogue.

This factual review will allow an understanding of the fundamental aspirations of the member communities and the risks and opportunities they share by their association with the nuclear industry.

Excerpts from Bill C-27 will be reviewed from the perspective of the member communities and will include critical comment regarding the various sections of the Bill and the practical implications for those communities involved in its siting process.

At this point, Mr. Kramer will switch from his role as CANHC chairperson to that of the Mayor of Kincardine. In this light, Mr. Kramer will touch upon his constituents' perceptions of the ongoing siting process of the low and intermediate level nuclear waste facility in Kincardine. This practical, real life dance between the community and Ontario Power Generation will be discussed with respect to the Memorandum of Understanding that was agreed to by both parties in June 2002. This project highlights the importance of mutual cooperation between the nuclear industry and the community in their efforts to debunk public hysteria as it relates to the storage of spent nuclear waste. Public education, safety and management methodology will all be important themes in our efforts to

bring public acceptance to the long-term siting of low and intermediate level nuclear waste management in Kincardine.

In conclusion, Mayor Kraemer will consolidate the collective thoughts of the nuclear public in an effort to build a solid foundation, from which both parties can gain critical public support. It will be from this fundamental buy-in at the local level that the economic aspirations of both the community and nuclear sector will be realised.

WHITESHELL LABS CLOSURE: CRISIS OR OPPORTUNITY?

L. Simpson

Mayor, Local Government District of Pinawa, Manitoba, Canada

When a major nuclear facility operator decides to close down operations there are many impacts on the host community. This is especially so when that operator has created a community to house its employees and maintained it to be totally dependent on the nuclear operation. The Whiteshell Laboratories of Atomic Energy of Canada Limited (AECL)¹ were established in Eastern Manitoba in 1963. At that time, the nuclear industry at Chalk River was expanding rapidly, had attained what was deemed to be optimum size, and the Pinawa site was chosen for further expansion because of a political will to energize the economy of what was then a relatively depressed area. The town of Pinawa was constructed at the same time in the boreal forest about 15 kilometres from the laboratory at the end of a newly constructed highway. AECL's control over the town ensured that diversification of the local economy did not occur for the next 35 years. On the other hand, AECL provided half of the revenue for the Town Council and injected about \$80 million per annum into the region through its operations.

In late 1995, it became clear that AECL's intention was to close the Whiteshell facility and move their core activities to Chalk River. Formal announcement came with the Federal Government's budget in the spring of 1996. The impact on the region and particularly Pinawa was devastating. The logic of the closure was questioned and the potential waste of a valuable infrastructure was feared. The liabilities of decommissioning the facilities and waste management area became a major concern. At that time two major programs dominated the activities at the Whiteshell Labs. The largest was the Nuclear Waste Management Program (NWMP) that had just completed its review of its plan for the deep burial of high-level nuclear waste in the granite structures of the Canadian Shield, and the Reactor Safety Research Program that supported the licensing basis for CANDU reactors.

Coincidentally, AECL had just made the decision that waste management was no longer part of their core business and, with the support of the Government, declared that the operators of nuclear plants should lead and fund this program in the future. This left the NWMP in limbo as a successor organization had yet to be organized and it was clear that it would take several years before this could happen. The Reactor Safety Research Program was scheduled for relocation to Chalk River in spite of the fact that this entailed closing down and moving large experimental facilities.

The Federal and Provincial governments created a task force to look for opportunities to bring new businesses to the facility and maintain what was at that time the largest research facility in Western Canada. The focus was on commercializing programs and technologies that AECL had declared outside of their core interests, but the concept of having a new site operator operating the Safety Program for AECL was also examined. The Task Force reported at the end of July 1996 with a

1. Atomic Energy of Canada Limited is a Canadian Crown Corporation wholly owned by the Canadian Government and administered by the Ministry of Natural Resources Canada.

number of recommendations, but no government action took place until the year's end. At that time, two consortia from the private sector expressed an interest in operating the NWMP and bringing their own business interests to the site, including decommissioning expertise. The Federal Government, AECL and the newly-formed Economic Development Authority of Whiteshell (EDAW) commenced discussions with the consortium, led by British Nuclear Fuels Inc., to work out arrangements for a takeover. Fifteen months later the discussions broke off after failing to work out an agreement. One of the reasons for this failure to agree was AECL's refusal to commit to significant decommissioning contracts at Whiteshell and Chalk River. Needless to say, this caused an already bad relationship between the community and AECL to get worse.

EDAW then focussed its attention on creating a business park utilising the empty buildings on the Whiteshell Site while, at the same time, developing a business plan for the privatisation of the NWMP that included a decommissioning component. A search was carried out for any business, not just those related to nuclear technology, to locate at the site. A potential private sector partner was found to privatise the NWMP, a business plan was created for the new business park and the necessary government funding was close to being secured. Again, a major interest of the private-sector company was the potential for large decommissioning contracts at Whiteshell. However, before this initiative could be completed, new management at AECL reversed their decision of six years earlier and decided that they would operate the program themselves and expand it to include a decommissioning capability. AECL made no promises that growth of this program, that by now had shrunk to a subsistence level, would take place at Whiteshell even though we had been assured by the government minister of the time that this would be the case. This decision was made one year ago so that, after six years, no capitalisation on any opportunities had occurred. The EDAW resigned in protest of the reversal of AECL's agreement to privatise the NWMP, as that also meant that the concept of the Site Business Park became non-viable.

Through all of this the officials of the town of Pinawa, the major stakeholder, were kept at arm's length from all the negotiations. With the dissolution of the EDAW, we decided that in future we must be at the table for all discussions relating to our situation. We were still dependent on AECL for half our revenue and, while not publicly stated, it was clear that AECL expected to see a reduction in their grant sometime in the future. Our focus was and is directly on diversification of the economy and growth of our community.

AECL has just received approval for their plan to defer completion of major decommissioning activities at Whiteshell for 60 to 100 years. This plan was approved by the Federal Government without public hearings and ignored the written objections of the communities and the Province.

This means that they will leave the site in a monitoring and surveillance state until such time as disposal facilities for low-level decommissioning wastes are available in Canada, and a high level waste repository is built for spent fuel and other materials. Our community and eighteen other Municipal Councils from the region have expressed disagreement with this approach but our detailed and technically sound submissions to the regulating authorities have evoked no response. Aside from the safety implications of this decision, the morality of expecting future generations to bear the high cost of decommissioning is questionable.

AECL is now applying for a decommissioning license to which both the local communities and the Province will object at a public hearing in Ottawa in November. The plan is offensive because it defers any major decommissioning work for decades. Contaminated buildings will stay in place and the waste management area, which contains the legacy of the practices of the 60s, will not be remediated any time soon. It is the position of the local Councils and the Province of Manitoba that it

is AECL's responsibility to provide the facilities necessary for full decommissioning and should start work to provide them immediately.

Thus in contrast to the problems presented by others at this workshop, our issue is not with what the industry wants to do in our community but with what they are not doing!

There are still opportunities to improve the situation. The opportunity remains for the NWMP to grow and prosper in Manitoba. The program has been severely reduced due to the cutbacks and AECL's lack of support over the past six years. It can be rebuilt and this should be done quickly before more critical expertise is lost. By entering into a program of full decommissioning in a continuous manner, employment opportunities for a permanent, competent decommissioning team will be possible. The continued presence of an activity at the site will be good for the local economy. It will also ensure that decommissioning will be done in a competent and timely manner. AECL should act now to build a disposal facility for low-level wastes at Whiteshell for the low-level decommissioning wastes. It could also be used for low-level waste from all of Western Canada. High-level waste should be dug up from surface burial, containerised and stored in concrete canisters until the final disposal concept is identified.

AECL/Federal Government should also assist in diversifying the economy of the community so that it is less dependent on AECL's grant.

Finally, there are several communities in Northern Manitoba that could provide an excellent centre for a HLW repository. I have recently visited these communities and met with their officials. These communities are in dire straits because of mine closures and I believe would welcome an opportunity of hosting a repository. Rail access to the deepwater port of Churchill would ease some of the concerns about transportation. There would be political barriers to overcome, but I believe if the local communities support it, it could be built. The location of a repository in Manitoba would provide a strong incentive for keeping the NWMP in Pinawa.

Future success will depend on cooperation amongst the stakeholders, AECL and the governments, and they all must be empowered to succeed.

DEVELOPMENT OPPORTUNITIES FOR NORTHERN ABORIGINAL COMMUNITIES FROM SASKATCHEWAN'S URANIUM MINING INDUSTRY

A. Richards

Cogema Resources Inc., Canada

Combining geology and community

Saskatchewan is fortunate to have the world's largest known high-grade deposits of uranium as well as a high level of provincial, public and northern community support. The uranium mining industry is focused on the Athabasca Basin in the far north part of the province. What we call the north consists of over a third of the province with a population of around 35 000 located in small, dispersed communities throughout this region of forest and lakes. It is within this unique combination of geology and community that our industry operates.

The active uranium mines are operated by either Cameco Corporation or COGEMA Resources and are located about 700 kilometres north of Saskatoon not far from the Northwest Territories. All of the uranium mines are in remote locations without nearby communities. The "local impact" communities as defined in the surface lease agreements are often several hundred kilometres away.

In the late 1970s, prior to the development of the Cluff Lake mine, a public board of enquiry reviewed the mine proposal as well as the general issue of uranium mining and potential associated effects. The Bayda Commission, as it became known, concluded that the Cluff Lake proposal could go ahead under a number of terms and conditions including maximising opportunities for northern business and employment. The commitments of the proponent were formalised in the surface lease agreements and, later, in associated human resource development agreements, and became the norm for uranium mining projects in northern Saskatchewan.

Working closely with northern communities, the uranium industry has implemented hiring, training and transportation programs that have attracted international attention. For example, northern employees are picked up at their communities by plane and taken to and from their jobs at the uranium mines. Employees work a seven-day, 77-hour shift followed by one week off. Half of the 1 300 uranium mine site employees are residents of northern Saskatchewan, the vast majority of whom are Aboriginal.

This high level of northern involvement resulted from a commitment to maximise northern involvement and expending the effort to make it happen. Literally dozens of policies, programs and projects were implemented over the past two decades with the net result of very high northern employment, contracting and supplying to the mine sites.

Northern Saskatchewan has a very young population, with about 40% (almost twice that of in the south) under 14 years of age. As a result, a major influx into the workforce has already begun, accentuated by a pattern of leaving school at an early age. This growing labour force, combined with high unemployment rates, has created major demands for job creation, relevant education and ensuring that northern development benefits flow as much as possible to northerners.

Building relationships (environmental risk or development opportunity)

The industry has worked with northern communities to develop innovative, joint projects such as the *Athabasca Working Group*, which focuses on environmental, economic and social effects of the mines in relation to the Athabaskan communities. The negotiated *Impact Management Agreement* provides the plan for a number of joint activities such as the community-based *Environmental Monitoring Program* where northern hunters and fishermen help monitor those aspects of the environment that are particularly important to them. The *Community Vitality Project* works with all of the northern communities to jointly monitor aspects of social well being or quality of life that are important to the north. Examples are migration patterns, youth issues and healthy eating. The three regional Environmental Quality Committees, with representatives from all of the northern communities, work with Provincial agencies and the uranium mining industry to ensure community concerns are included in decisions.

Through corporate donations and other forms of support the uranium industry assists with health, education, recreation and other community-based activities.

Residents of northern Saskatchewan, like all other Canadians, are not prepared to accept environmental risks in return for economic opportunities. Environmental and economic discussions are usually interrelated. For example, compensation is guaranteed for hunters and trappers should their livelihood be affected. Economic development within a high level of environmental protection with local involvement is a very significant issue in the north. As a result, northern support for uranium mining is closely tied to satisfaction on both environmental and economic issues. Occasional rhetoric is heard. Mutual trust and constant communication are crucial.

Maximising northern employment opportunities

Below are some of the activities that COGEMA Resources, both alone and with other organisations and companies, has undertaken to maximise northern participation in mining. The list is not all-inclusive, but is provided to indicate the range of activities and corporate commitment necessary to achieve these goals.

- Our mine site personnel officers are all Aboriginal. The Aboriginal languages are also used, where appropriate, during training, working and as part of camp life.
- COGEMA Resources maintains offices in the northern communities of La Ronge and, until recently, Buffalo Narrows as well as cost-sharing an employee relations counselor working from the Athabaskan community of Black Lake.
- A keystone of COGEMA Resources' relationship with the north is the involvement of northerners in committees to review, discuss and recommend actions.
- A database is developed and maintained of northern residents interested in employment with COGEMA Resources and/or companies providing long-term contracts.

- Some positions at the COGEMA Resources operations are designated as “northern only.” For example mill operators, while requiring some basic education and skills, are trained on the job. The positions generally can be filled entirely by northern residents. Other positions designated for northerners are mine heavy equipment operators, warehouse persons, trades helpers, personnel assistants, recreation technicians, apprentices, general maintenance operators, survey assistants and office assistants.
- The progressive training system developed by COGEMA Resources allows most workers to move from entry-level positions to the top level in a period of less than five years with wages increasing for each higher level attained.
- School career days, career symposiums, summer student employment, work placement and other means of introducing the company and the industry to students are used to raise awareness of opportunities and to encourage continuing education.
- A northern scholarship program was initiated in 1979 for students attending post-secondary educational institutions.
- COGEMA Resources is involved in a number of more general workforce skill development initiatives such as the Multi Party Training Agreement involving \$25.5 million cost-shared to reduce academic and skill barriers to employment and to upgrade literacy for job entry, technical and supervisory positions.
- Since both mines operated by COGEMA Resources are unionized, the collective agreement supports a northern preference clause. It includes preference for northerners to retain jobs if a downsizing occurs, and gives northerners priority to openings in apprenticeship and other positions.

Maximising northern business participation

Largely due to the uranium industry, the last decade has seen the emergence of many successful northern-owned companies able to compete for industry work. Saskatchewan First Nations companies such as the *Prince Albert Development Corporation* and *Northern Resources Trucking* have years of association with the uranium industry. In 2000, about \$180 million worth of goods and services for the uranium industry went to businesses based in northern Saskatchewan.

The nature of mining in northern Saskatchewan provides the opportunity for much of the support and some of the operational activities to be contracted out to northern businesses. Cooking, cleaning, security and blasting are typically provided by service contracts with northern companies, often entirely Aboriginal owned. An example is the Prince Albert Development Corporation, owned by 12 bands of the Prince Albert Tribal Council, which in a joint venture with PCL-Maxam was awarded the contract to supply materials, equipment and labour to construct the uranium mill at our McClean Lake operation.

The last decade has seen the emergence of 100% northern-owned companies able to successfully compete for work, in addition to the many successful joint ventures that already exist.

The future

These programs involve substantial costs to the mining company such as northern transportation to and from individual community pick-up points, higher turnover (initially), higher

recruiting and training costs, scholarships, etc. There are also substantial benefits to the company such as a stable workforce used to working in northern conditions, community support and understanding, and the development of very capable, competitive northern business partners.

Northern participation in Saskatchewan uranium mining has developed to the point where it has become an integral part of the industry. COGEMA Resources is proud of this success, but there are always improvements to be made. Increasing levels above the 50% to 60% range requires finding candidates with specialised technical and academic training as well as extensive mining experience who are also residents of small, remote northern communities. Accomplishing this is a long-term commitment of COGEMA Resources and the uranium industry that will take years of effort to show progress.

URBAN QUALITY OF LIFE AND INDUSTRIAL PROJECT MANAGEMENT: THE CASE OF ALCAN ALUMINIUM SMELTER IN ALMA, QUEBEC, CANADA

M. Simard

University of Quebec at Chicoutimi, Canada

Study background

This quality-of-life study involving the population of Alma (30 126 inhabitants) is part of a five-year, multidisciplinary research program entitled *Modélisation du suivi des impacts sociaux de l'aluminerie Alma* (www.uqac.ca/msiaa). The goal of this research program is to document the social impacts arising from the establishment of the Alcan industrial megacomplex in Alma (see Map 1). The Alma smelter began operation in 2001. It employs 865 people and has a production capacity of 407 000 MT of aluminium ingots.

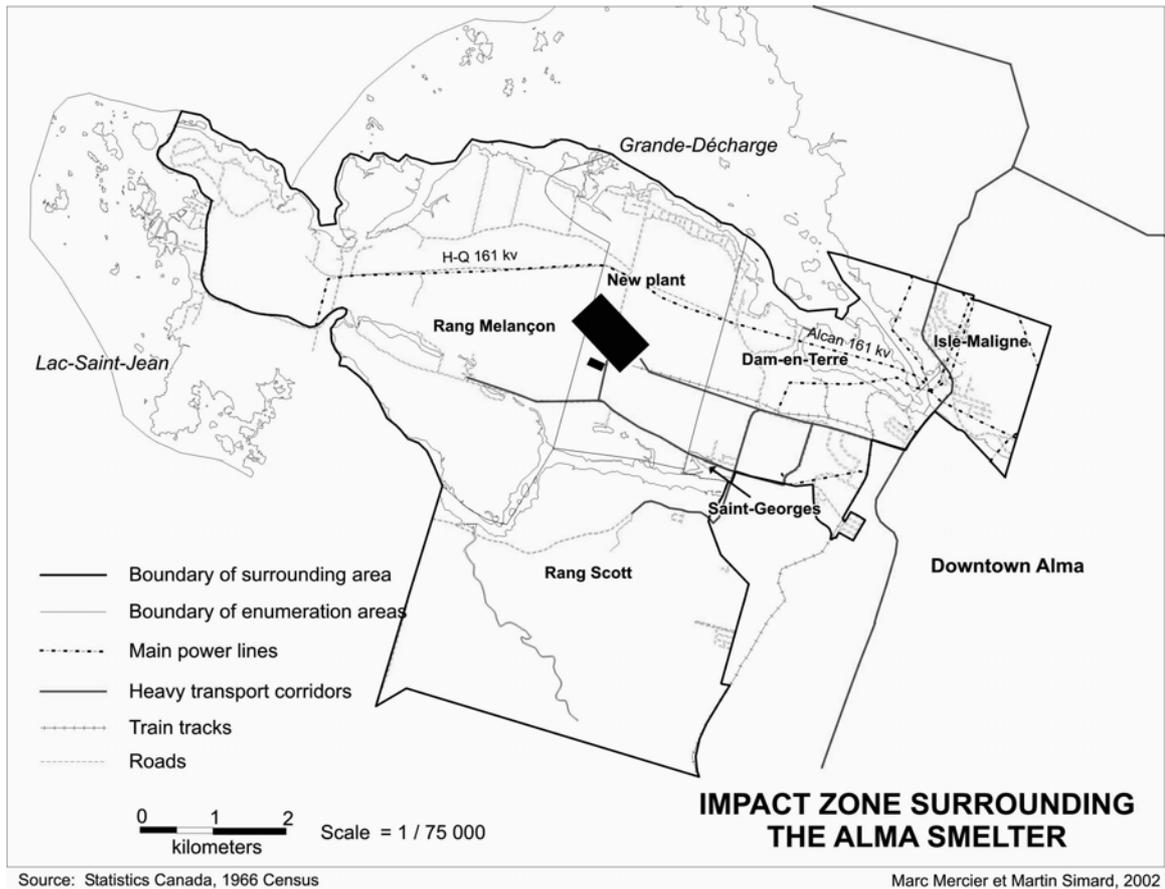
The research program is being carried out in parallel with the project, rather than retroactively. Thus, various thematic reports have been published on topics such as the project's economic spin-offs and changes in the housing and transportation sectors. More specifically, this study aims to gauge the perceptions of Alma residents regarding their quality of life as stakeholders. In order to ensure that the study produced a more accurate indication of the community's evolution and to tie the study in with the various phases of the implementation of this industrial megaproject, it was conducted in three parts, i.e., in 1998, 2000 and 2002, corresponding to the planning, construction and operation phases.

Quality of life: Approaches and definition

Interest in quality of life is not a new phenomenon. The ancient Greek concept of *eudaimonia* encouraged individuals to achieve their full potential in order to ensure they had a good life (Dubois, 1999). A good life was often associated with a good living environment, particularly in the writings of Aristotle and Plato. The importance of geographic context for the Greeks is symbolized by the model city plan proposed by Hippodamus of Miletus in the fifth century BC.

In the quality-of-life literature, studies generally follow one of two approaches: those that use objective indicators and those that concentrate on subjective indicators. Objective indicators are quantitative measurements such as migration and housing data from Canadian censuses. Subjective indicators are qualitative measurements that are generally drawn from interviews with residents and that are based on their perceptions and their degree of satisfaction with living conditions. Our research is based on the second type of approach. Individuals and communities act according to their perceptions, which then become concrete realities that must be taken into account.

Map 1. The Alcan industrial megacomplex in Alma



The definition of quality of life is therefore related to the two approaches described above. There is no perfect or complete definition of quality of life. However, we can use the definition proposed by the World Health Organization for the related concept of health, i.e., "a state of complete physical, psychological and social well being." Despite its subjective and interpretive nature, quality of life seems to be associated with the fulfilment of certain physiological and psychological needs, such as those identified by Maslow in 1954. Therefore, the economic and geographic conditions experienced by individuals and local and regional communities are significant factors in the fulfilment of these needs.

Research objective and methodology

The two objectives of the study were:

- To develop a profile of quality-of-life perceptions of Alma residents, with an emphasis on the evolution of those perceptions between 1998, 2000 and 2002 and the evaluation of variations in perceptions among different population subgroups.

- To examine the impact of the Alma smelter, particularly the possibility of a relationship between residents' perceptions and the changes brought on by the new industrial megacomplex.

The same questionnaire was used during the three phases of the study. It contained 34 questions administered in person by investigators. Interviews lasted an average of 20 minutes each. The study was carried out in three phases, i.e., in 1998, 2000 and 2002. Each time, the study covered a representative sample of the population, taking into account the demographic weight of the Statistics Canada enumeration areas (1996 boundaries). The response rate ranged between 61.3% and 73.0%. The questionnaire was administered by a team of 22 investigators.

Main results

The study of the perceptions of Alma residents of their quality of life indicated that, as stakeholders, residents are generally satisfied, despite an increase in impacts during the construction phase of the Alma smelter. The responses gathered showed a broad consensus on a number of issues.

Thus, an Alma resident is generally someone who:

1. Is satisfied with his/her quality of life with respect to the biophysical and community environment as well as the economy.
2. Is concerned about issues related to health and family.
3. Sees Alma as a dynamic community and does not plan to move.
4. Perceives few environmental risks, while remaining aware of the possible effects of industrial activity (see Table 1).
5. Is somewhat dissatisfied with the traffic situation and noise caused by blasting during the construction phase.

Table 1. **Positive evaluation of the state of biophysical environmental indicators**

Indicators	1998	2000	2002	Average
Drinking water	87.8%	87.4%	91.4%	88.9%
Ambient air	87.4%	89.5%	85.0%	87.2%
Acoustic environment	93.4%	79.2%	75.2%	82.2%
Green spaces and recreation areas	81.3%	79.3%	74.0%	78.0%

Conclusion

The three-part qualitative study proved to be an interesting and effective way of obtaining new information that will be useful to local and regional stakeholders. This information is based on the daily lives of residents, as part of a process that integrates all aspects of community life. This process relies on sources other than the traditional sources of information, which are based on the opinions of experts working in related fields. It is therefore an innovative research approach, designed to complement the usual data sources.

This type of study goes far beyond the sphere of environmental assessment and could be applied to various fields, such as public health, urban planning and regional development. The concept of quality of life allows a detailed and comprehensive examination of the physical and mental condition of residents. The longitudinal qualitative study is a tool for social and territorial monitoring that takes into account the duration and context of events. It can be associated with a new generation of studies intended to lead to projects adapted to the characteristics of affected populations and implement programs and policies that are responsive to the needs of residents. In this way, by ensuring the social acceptability of private and public action, these processes contribute to the well being of stakeholders and the general population.

Bibliography

Bates, J., R.A. Murdie and D. Rhyne. 1996. *Monitoring quality of life in Canadian communities: a feasibility study*. Centre for Future Studies in Housing and Living Environments, CMHC.

Bedard, G. 2000. La qualité de vie dans une petite ville industrielle (Alma, Québec) : perceptions des citoyens en 1998 et 2000. Research report. Chicoutimi: GRIR, UQAC, 64 pages.

Caron, N. and Simard, M. 2001. Transport lourd lors de la construction du complexe industriel Alma : suivi des prévisions. Research report. Chicoutimi: GRIR, UQAC, 81 pages.

Cote, G. 2001. La dynamique des acteurs dans le suivi des impacts sociaux : le cas du transport lourd dans le rang Scott (Alma, Qc). Research report. Chicoutimi: GRIR, UQAC, 61 pages.

Cutter, S. 1985. *Rating Places: a Geographer's View on Quality of Life*. Washington: Association of American Geographers Resource Publications in Geography.

Dennis, R., R. Renwick, I. Brown and I. Rootman. 1996. "Quality of Life Indicators and Health: Current Status and Emerging Conceptions." *Social Indicators Research*, 39: 65-88.

Diener, E. and S. Eunkook (1997) "Measuring Quality of Life. Economic, Social, and Subjective Indicators." *Social Indicators Research*, 40: 189-216.

Doucet, C. 2000. Les impacts de l'implantation d'un projet industriel majeur en milieu habité sur le parc de logements intermunicipal : le cas du complexe industriel Alcan à Alma (Saguenay-Lac-Saint-Jean, Québec). Master's thesis, UQAC, 305 pages.

Dubois, M. 1999. La qualité de vie des citoyens de la municipalité d'Alma. Chicoutimi: GRIR, UQAC, 40 pages.

Gagnon, C. et al. 1999. *Alma et sa région d'appartenance : Portrait de référence*. Chicoutimi: UQAC, Research report, 111 pages.

Lepège, A. 1999. *Les mesures de la qualité de vie*. Paris, PUF.

Plourde, L. 2001. Portrait de la formation des travailleurs des industries de la construction et de l'aluminium. Research report. Chicoutimi: UQAC, 33 pages.

Schwirian, K., A.L. Nelson and P.M. Schwirian. 1995. "Modeling Urbanism: Economic, Social and Environmental Stress in Cities." *Social Indicators Research*, 35: 201-223.

Tobelem-Zanin, C. 1995. *La qualité de vie dans les villes françaises*. Rouen, PUR.

DEVELOPMENT OPPORTUNITIES FOR COMMUNITIES: ROUND TABLE DISCUSSIONS DURING SESSION III OF THE FSC WORKSHOP IN CANADA

E. Atherton
Nirex, UK

During the round table discussions the following comments were made. They are grouped under themes and are presented in no particular order. They are developed from the presentations made in the plenary session by each of the round tables. The comments do not represent consensus across all groups but reflect comments that were made.

All the round tables agreed that a lot of lessons had been learned from the discussions that had taken place especially about the communities in Port Hope and Pinawa and these should be taken into account in the FSC and the work that it does.

Question 1: How does community status (volunteer community; waste source community; neighbouring communities; economically comfortable or blighted community etc.) influence the view of risks and opportunities?

Community status

The well being of a community will affect their willingness to accept a waste management facility. If they are a poor or disadvantaged community they may be more willing to accept higher risks. (The issue of trade offs is discussed in detail under question 2 below.)

Community status has an influence on the risk perception and opportunities that communities will consider.

Discussants felt that we must bear in mind that the waste already exists.

Neighbouring communities

Neighbouring communities can sometimes oppose plans perhaps because they don't have as many opportunities to be informed and involved in the debate as the potential host community. This lack of coordination can cause problems.

Neighbouring communities do not necessarily share the same view as the potential host community. That's why transportation can be a problem because the communities along the transport route don't often get the benefits that the host community receives.

Current host communities

In a community that already has waste the history with the organisations involved in waste management is very important. The relationship between the community and the waste management company or the company that has produced the waste and also the behaviour of the waste producer in the community have a big influence on how the community reacts to the facility.

Many waste source communities want solutions to the waste in their area and they are pressed to push for solutions. It's important for these communities to discuss with the waste owners to develop a joint solution. Their input may also help in other situations.

On the basis of presentations heard in Session III, communities who live close to nuclear facilities or who have familiarity or experience with them appear to be more open to the possibility of accepting a waste management facility. Examples were nuclear industry communities who want to expand the facilities in their area or historic waste communities who are ready to solve the problems in their areas. However, discussion showed that "nuclear communities" may also express the sentiment that "enough is enough" and they don't want any more nuclear in their area.

Knowledge and familiarity, often cited as explanatory factors for local acceptance, therefore do not always function in the same manner. You cannot predict the reaction to a waste management facility depending on the proximity of the community to a current nuclear facility. Reflecting on the examples cited, there seems to be an influence by the locus of the decision – whether the decision is made in the community or imposed on them from outside.

Receptiveness to hosting a facility, in the communities represented at the workshop, seems to be linked to the sense of effective participation and control over the decision and the ability to make the decision from within the community. Conversely, if the decision is imposed on a community from outside then there may be a feeling of victimisation.

In this light, one of the valuable aspects of the environmental assessment (EA) process is that it brings the decision making closer to home and actually involves the people who are affected. Equity is achieved not only by economic arrangements, but moreover by the ability of the community to contribute to defining the management option that will be used for their community. The expectations of the communities for this process were clearly expressed by e.g., the Port Hope speakers: they suggested that the EA discussions will work out remaining uncertainties in project design and management. In a way, EA will function as a new phase of negotiation in which these local stakeholders appear confident that they can make themselves heard.

The presence of a partnership contract between the communities and the Federal Government is a further guarantee that the decision making process will go forward in an orderly manner. Government partners mentioned that a reserve is placed on the \$10 million (Canadian) associated with each management facility: if the communities want to be able to spend that money, rather than returning it to the government, they have a strong interest in seeing the process through to the end. On the other side of the table, local elected officials expressed confidence that if current contract provisions (e.g., basic facility design options) are not respected, they will be able to withdraw from the process and request the establishment of a new updated contract.

Issues to be taken into account

One of the round tables identified two dimensions to the problem, knowledge and return. For example a poor community could be accused of selling their health for an economic return.

Discussants felt that volunteer communities and waste source communities must have a system to inform residents about both their understanding that the waste exists and their will to do something about it.

In the case of volunteering communities if there was one candidate that volunteered then it could encourage other communities to volunteer because they could see that one community trusted the process. If they actually knew the volunteer community it could build confidence among their own community leadership.

Discussants felt that there needs to be an organisation who is clearly leading the process and who is in charge of moving things forward.

The regulator as a neutral party or peoples' expert can help the communities to understand what is at stake in terms of process and safety.

Question 2: What kinds of trade offs are communities willing to make?

The sorts of trade offs that communities are willing to make depends on whether the community knows and is familiar with the industry, what the history of the industry is with the community, whether there is an existing problem in the community that needs solving or whether the community is being asked to accept new facilities.

There are trade offs in the social and political area and these are usually examined in the strategic environmental assessment or environmental impact assessment and social impact assessment (SEA, EIA and SIA). It's important to use these vehicles early in the process to identify issues early so that they can be addressed.

One of the round tables identified that the term "compensation" itself is a value judgement. It suggests that you are paying the community to take a problem. It may make the people think of stigmatisation, therefore, it may be better to talk about development opportunities because there could be less stigma attached to them. However, some trade offs or compensations need to be in the form of money, for example the property valuation programme created at Port Hope.

Another term that can be used instead of "compensation" is "equity payment". This is one of the terms preferred by the Port Hope stakeholders to describe the \$10 million (Canadian) host community fee paid by the federal government, which will become the property of the communities at such time as the low level waste facilities are licensed and operating. This term signifies recognition that the Port Hope communities have accepted to resolve a problem stemming from activities that were beneficial to the nation – and a problem that no other community could be convinced to take on.

Round tables felt that a key aspect is that communities want to protect their employment, sustainability and quality of life and may be willing to make trade offs in order to protect these issues. Community stability and way of life are important issues that need to be addressed in discussions.

Some of the round tables felt that certain things cannot be traded. These included:

- reasonable health;
- quality of life;
- safety;
- security – these cannot be traded away;
- deliberate environmental contamination;
- environmental impacts in general;
- abandonment of a situation by an industrial organisation – nothing can acceptably compensate for these.

Discussants felt that in most situations people will not trade off health for new industries. Some communities already face health risks for jobs and this may make them more amenable to accepting other risks but in some ways it may also make them think that they have already faced enough risks and do not want to accept any more.

As long as the basics are assured (health, environment, safety) most communities can become quite flexible and innovative in negotiating opportunities and trade offs for their community.

Communities may undergo some internal weighing of risks versus economics but people felt that primarily attention is paid to risks and health. This is where there is a key role for the regulator who some discussants felt hadn't been so prominent in the Canadian situation and in the interactions in the communities.

The goal has always got to be to retain or improve the quality of life in a way that maximises the benefits to the community at large rather than small segments of the community.

Laws in different countries prevent environmental racism (the concentration of environmentally degrading activities in communities of poor and/or racial minority residents), or unacceptable trade offs against the environment. Such laws do not come out of the blue: first of all, they were passed in reaction to real situations, and furthermore they are underpinned by values that state that the environment cannot be traded. In the past there was an explicit, if covert, strategy to seek economically blighted communities to site industrial facilities in the belief that people would trade anything for jobs; however, this is not the case.

An example given by the Session III speaker from Cogema Resources Inc. (Richards, this volume) illustrated how Aboriginal peoples, like other people, may value lifestyle and the traditional natural environment much more than they do economic opportunity. “There is no money in trapping”, he said, “but trapping is a really big deal up North” in Canada. He spoke of the respect and interest accorded by Cogema employees to the wisdom of an elder who shared his trapping experience in the company canteen. Quality of life, as discussed notably by the SIA experts in Session III and Session I, is a rich concept of what is involved in trade offs. It reflects an understanding that the preferences and motivations to be found in individuals and social groups are very diverse.

These realisations represent a break with a dominant paradigm of the 20th century. Reasoning about human nature and choice often was framed, in both educational and organisational contexts, by the observation that it is possible to reinforce behaviours by reward (or to eliminate them by punishment). Psychologist B.F. Skinner, a radical proponent of behaviourism once observed (not

unwisely) that “money is the universal reinforcer”. In many societies money is often the thing that can create or draw out behaviour in individuals. It is perhaps not surprising that siting policy may have relied in the past on reasoning that people will make large trade offs for money. However, this is not necessarily true in communities as a whole. It is reassuring to note that today a richer concept like that of quality of life is guiding more decisions.

Canada

In Port Hope the trade offs seem to have worked well in structuring the waste management project. The trade offs that were made were chosen in order to enable a safer community. If as in Port Hope there is an existing problem (for example, an industrial project in the town) the outcome sought by the community is a safer place to live. But the management project in itself can, during the active phases, result in temporarily increased risk and disturbances (for example, noise and dust).

What trade offs a community is willing to make depends on the community’s perception of risks, social concerns and responsibilities. To create a pragmatic discussion on trade offs, there is a need for good communication between the implementer and the community, but also with the regulator.

If you think about the Port Hope situation and how applicable it is to other radioactive waste management issues we can find some common threads. There needs to be an agreement among stakeholders that there is a problem to solve. The communities where there is successful agreement on the need for waste management seem to be those familiar with the nuclear industry and who have some experience of the risks associated with it.

Legacy issues are very important and could help us to help a community to understand that there is a problem that needs to be solved. However, on the down side it could increase mistrust in the community because the bad performance of the industry in the past could affect current discussions.

If there is already waste in a community then there is an opportunity for the community to make the current situation better and obviously there is sometimes an economic dimension to the question in the sense of creation of jobs and the work that needs to be done along the way.

Organisations

One of the round tables felt that at the end of the day there is someone in authority that has the responsibility for the waste and they cannot delegate this to others but they need to take other people’s views into account in the decisions that they are making.

An important issue in all the discussions about trade offs is that technical people need to learn to communicate more with others because this is the only way that communities will be able to understand what is happening and be able to make decisions about the trade offs that they are willing to accept.

Nowadays we are moving from a technocratic to social society therefore we need to listen to the public’s issues and take them into account in the decision making. One of the round tables asked whether this really means that you have to follow the public’s decisions if they are contrary to reasoning by expert actors?

Question 3: Should development opportunities be a pre set part of the package or should partners work up their own solutions according to identified concerns and project status?

There were different views on the answer to this question, some discussants felt that nothing should be pre set and that every element of the package should be developed through consultation. Others felt that some elements could be pre set, for example, the process for negotiations, but that most of the elements should be developed through consultation, be specific to the community and situation being addressed and be community driven.

An important aspect across all round tables was the opportunity for the community to develop their own solution and continuous negotiation with the community throughout the process.

Discussants felt that there needs to be provision in the package for later development or for the creation of new information that was not anticipated during the original negotiations. However, you must remember this is not a blank cheque process and some safeguards must be put in place for the proponent.

It was felt important to clearly define who are the stakeholders in the discussions and who has the right to debate the opportunities on behalf of the community.

There needs to be high quality, up front negotiation to help the community to understand what they are entering into and what opportunities could be available. The selection of the exact development opportunity depends on an understanding of the origin of the concerns and the communities' needs.

It is important during the discussions to understand what would be the worst case situation if things went wrong and there need to be the opportunities for reviewing the benefits and the communities' needs as time goes on.

Discussants observed that in Canada setting up a partnership between the local community and those in authority had worked very well. It showed that there needs to be an enduring institute set up between the community and those in authority. Partnership is more critical than the amount of money given to the community. It's about sharing responsibility for what is going to happen and ensuring the community has the power to influence the situation.

Developing the packages

Round tables observed that packages are being developed in several areas but they tend to have similar elements in them: for example jobs, business opportunities, training, environmental aspects and decision making and involvement opportunities for the communities.

Communities from different areas are discussing with each other and learning lessons so this could develop into more commonality in the agreements between communities and industries in the future.

Some of the elements that might be included in packages are:

- oversight on monitoring of the situation by the community;
- property valuation protection;

- compensating facilities, for example, recreation facilities;
- emergency response resources to help the community to cope if something goes wrong;
- employment and training;
- money;
- the provision of independent contractors to work with the communities.

Discussants commented that money needs to be allocated in a thoughtful way and there need to be safeguards for institutions distributing the money so that recognition of the need for financial compensation doesn't just become a blank cheque.

Taboo or Stigma

Some round tables discussed the element of taboo and stigma and concluded that this differs from country to country, but it can have an impact on the discussions. They felt that the definition of risks is also an issue. If people have worked in the industry then they perceive the risks in a different way and possibly consider that they have less of an impact, but obviously this depends on the community experience including their interaction with the nuclear industry.

Stigmatisation can also depend on the industry itself: for example in Alma the aluminium smelter mega complex was seen as a gift because it provided jobs and other opportunities for the community. Nuclear waste or spent fuel facilities may be perceived as less of a gift but it will depend on the benefits which are given to the community.

Question 4: Do development opportunities contribute to building social trust among stakeholders or does that depend on other aspects of their relation?

Most of the round tables did not feel that development opportunities build trust, but could possibly contribute to it. They felt that it was more important that people deliver what they promise, and that relationships and interactions between the communities and those in authority were also important.

Some people mentioned that social trust is built if there is a feeling that the community are being taken seriously and that the process is being undertaken in a fair way and if these stakeholders are effectively allowed to contribute to the debate.

One of the round tables concluded that development opportunities are not a complete symbolic stand-in for what is at stake concerning trust. The community demands listening and openness and long-term commitment from neighbouring industrial organisations. Assurance is required that “the phone will not ring in an empty room” in the future because those in authority have abandoned the community (for example, when they leave a decommissioned facility). Long-term mutual involvement and communication with the community must be set up.

One round table pointed out that if economic impacts occur the impacts are not necessarily local, therefore, a broad impact assessment needs to be undertaken. Some benefits are concern based, others are related to developing the community itself. It could be that infrastructure benefits go across communities but whatever benefits are considered they must be justifiable and accountable and any compensation elements must be very clear.

Question 5: How to ensure that the development solutions stand up over the time of the project?

The round tables identified several different aspects that they felt were important to ensure that the development solutions stand up over time. These included:

- Making the trade off overlap with respect to cost and benefits. For example, the facility becomes a community recreation centre so the facility is linked to ongoing community life;
- Having carrots and sticks: punishment should apply if the proponent breaks its commitments to the communities;
- Formal agreements with parliament which means that the agreement will be outside of changes in political parties and therefore the agreements will last;
- Community representation on boards and committees that will last over time;
- Partnership from the beginning to the very end of the project, including the closure and the monitoring of the facility to ensure long-term solutions;
- Financial guarantees for ending projects;
- Taking a broader view on the extent of financial guarantees not just related to clean up but also to the development of the community for the long term.

The need to review benefits over time was also identified as an important issue. Discussants felt that the community should be better off when the industry actually leave than they were before.

Some discussants felt that there should be an accountability mechanism for decisions made by the community as well.

How are community needs and views monitored over time?

With respect to monitoring views over time discussants felt that it is essential to do regular reviews of people's views because communities change and their situation may change as well. They felt that to do this will require the use of several techniques including surveys, focus groups and an ongoing dialogue with the community.

A warning was made about identifying community needs and views. Some discussants felt that social studies (for example, social impact assessments) should not be considered to be an interaction channel with the stakeholders. They are an important snapshot at a point in time, but are no substitute for ongoing communication, dialogue and involvement.

SESSION IV

Thematic Reports

Chair: Carmen Ruiz López
CSN

RADIOLOGICAL RISK ASSESSMENT: SCIENTISTS' CONCEPTS AND LAYPEOPLE'S CONCERNS

D. Bard, MD

National School of Public Health, Rennes, France

Introduction

Building confidence among stakeholders implies as a necessary, if not sufficient, condition the sharing of a common understanding of what is at stake. The most significant stake concerns the potential consequences to people's health of the presence in their environment of radioactive material. Surprisingly, this question was not addressed directly during the Ottawa workshop, nor during the previous FSC workshops. This presentation is an attempt to explain as simply as possible both:

- the bases of scientific knowledge about this significant stake,
- and the way people concerned may exert a certain degree of control on what's occurring in their environment.

Accordingly, key concepts are introduced, i.e., hazard and risk, dose, expression of risk estimates and the different ways they can be expressed. Finally, based on what was heard in the course of this workshop, some questions are raised that should be addressed in radioactive waste management situations.

Hazard and risk

Differentiating *hazard* and *risk* is both practical and widely used, in particular by US National Research Council (1) and by some European Union scientific and administrative bodies. Hazard is the intrinsic property of something to cause harm to persons, or laboratory animals. Risk is a quantity, in general expressed as a probability, e.g., of getting sick after having been exposed to a hazardous agent. Therefore, hazard is an absolute; the risk represented by any hazard is connected to how the hazard is managed.

In order to illustrate these distinctions, we may draw a comparison between ionising radiations, and heat.

The hazards associated with ionising radiations include radiological lesions of different organs and surfaces (e.g. skin, or cornea), temporary or irreversible sterility, all occurring in the short term after exposure, and cancer, which takes many years to develop. Similarly, the hazard associated with a high temperature, given sufficient contact time, is burns, as everybody has experienced at least once.

Knowledge of long term consequences of exposure to ionising radiations rests essentially upon data from epidemiological studies. Those include the continued follow-up of the Japanese survivors of the atomic bombings of Hiroshima and Nagasaki, studies of patients exposed to radiations for diagnostic or therapeutic purposes, of workers occupationally exposed in the nuclear industry, of populations exposed to terrestrial natural radioactivity, of populations exposed at home to radon (a naturally occurring radioactive gas), and of populations exposed to radioactive material fall-out from atmospheric tests of nuclear weapons or from the Chernobyl accident (2-4).

In the case of radiation-induced cancer, as in the case of burns (whether caused by radiations or by heat), there is no uncertainty in hazard identification. The effects are seen, the harm is done, and the agent is identified.

Risk : a function of dose

The greater a dose of radiations or the exposure to a high temperature, the greater the damage to living organisms. Such relationship is termed by scientists the *dose (exposure)-effect* or *dose (exposure)-response* relationship. There are two important differences in this regard between radiation-induced cancer and heat-induced burns.

First, everybody has experienced that below a certain temperature level, no burns occur upon exposure to heat. In other words, there is a threshold below which there is no effect, no burns in this case. This holds true also for radiation-induced burns and other *short-term* consequences of exposure to radiation. But regarding *long-term* consequences of the latter, radiation-induced cancer is considered for practical purposes as a non-threshold phenomenon. In other words, any dose of radiation, even very small, is taken as signifying a risk of future cancer, in proportion to the dose received.

It should be pointed out that the dose-response relationship for radiation-induced cancer continues to fuel a controversy, with on the one hand excellent scientists arguing that there is in fact a threshold as well for radiation-induced cancer risk. Some scientific evidence is even found to support the idea that exposure to low doses may be beneficial to health. However, so far it has not been convincingly demonstrated at what dose level(s) a threshold could be set. Although it cannot be demonstrated beyond question that no threshold exists, it was deemed cautious by all the international bodies of radioprotection experts (5) to act as if, indeed, there is no threshold.

Second, it has been also experienced by everyone that the *severity* of burns increases proportionately to exposure to heat. In contrast, since a cancer may or may not ensue, it is the *probability – not the severity –* of getting cancer that increases with radiation dose for an individual (or the cancer *frequency*, within a population).

It should be recognised that, as compared to burns caused by heat – a direct and universal experience for humans – to become aware of radiation doses and their consequences in terms of cancer risk requires a certain amount of computation (sometimes to an extremely sophisticated level in epidemiological studies on radiation-induced cancer risk). In other words, such consequences are not accessible to immediate experience, nor are radiation doses perceived by our sensory organs. However, radiation exposure may be measured readily and inexpensively.

What is a dose (unit) of ionising radiations?

Here is a “simple” statement about dose, drawn from a scientific publication (3): “The Gray (Gy) refers to the absorbed dose, *i.e.* the quantity of energy delivered by ionising radiations per unit mass. One Gy equals 1 Joule/kg. When an individual is homogeneously and externally exposed, each part of the body receives the same dose. The whole-body dose is then an appropriate concept. When exposure is heterogeneous, however, different organs or tissues receive different quantities of energy. In such an event, using organ dose is more appropriate. The equivalent dose takes into account the biological potency of different types of radiation (X, gamma, beta, alpha, neutrons) by applying weighting factors (respectively, 1, 1, 1, 20, and 10). The equivalent dose unit is the Sievert (Sv). The effective dose, also expressed as Sv, is the result of a calculation that provides a single summary value to be used in different cases of irradiation. It sums and weights the equivalent doses received by tissues or organs, according to their sensitivity to the effects of ionising radiations. The weighting factors used in such a case are derived from previous epidemiological studies of radio-induced cancers. Using the effective dose is more appropriate for radiation protection purposes”.

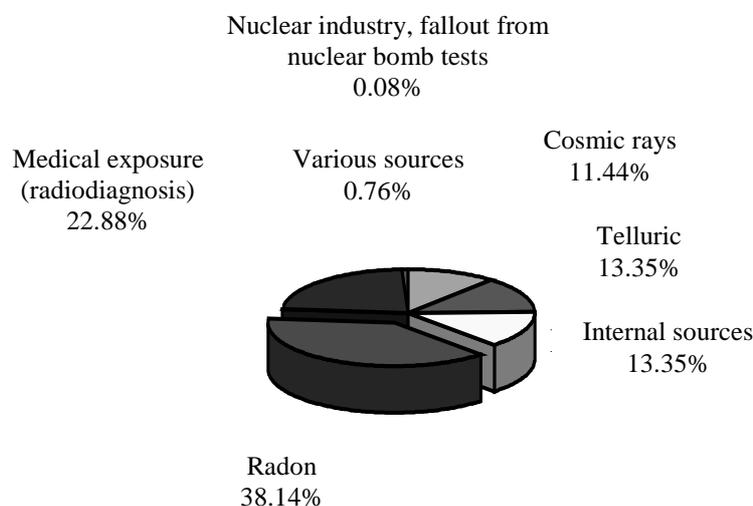
This expression of a very complicated construction from epidemiological and experimental data was written in a deliberately simplified form with the aim to be read and understood by scientists not familiar with those concepts. Obviously, it is still fairly complicated. In addition, the above statement leaves aside a very important question, that is, the *dose-rate effects*. At relatively low doses (well below those causing burns for instance), the effect on cancer risk may be different if the same dose is received over a short time, *e.g.* seconds, (high dose-rate), or over a long period, *e.g.* years (low dose-rate). This is still a matter of debate and scientific research.

Several hours are needed for those concepts to be understood, even by very smart people, with the simple objective of permitting discussions among stakeholders. Much more time has to be spent to be able to grasp their underlying uncertainties (for instance, dose threshold or not, adequacy of weighting factors, effects of dose-rate).

In the specific case of low activity waste disposal, people living in the area may be exposed to low doses only. Accordingly, the health effects to be considered are those of low dose, low dose-rate exposure, that is: not radiological lesions or sterility, but rather, long term cancer risk.

In addition, it should be stressed that everyone, no matter where we live, is exposed to a certain degree of naturally occurring radiation, including that originating from our own body. This has to be taken into account in any dose calculation and contributes to cumulative cancer risk, in the same way that radiations originating from human activities do. In this light, it may be useful to refer to the following example from Canada (Figure 1) showing the distribution of doses received from man-made and natural sources. During the workshop we heard the Mayor of Port Hope pointing out indeed that the expected level of exposure in his town after clean-up will be within the range of exposures occurring naturally in several regions of Canada.

Figure 1. People's exposure to radioactivity in Canada (6)



Expression of cancer risk estimates

When assuming there is no dose threshold, it is always possible to assign a level of future cancer risk to any dose level (while remembering that all doses received are cumulative and will contribute to an individual's actual risk). However, when sizing the risk due to a specific exposure situation, the term usually used is the *excess risk* due to this case. For indeed there is a baseline (or "spontaneous") risk caused by all other concurrent causes of cancer (diet and other lifestyle risk factors); the specific radiological exposure situation in question adds to (is in excess to) this baseline risk.

The expression of excess risk estimates for a person (or an average individual in a specific setting) who receives a dose at a given level for a given time period (averaged over a lifetime), is expressed as a probability. In the case of low dose, low dose-rate exposures, for instance, the risk estimate for an individual to die from or to get a cancer due to the dose received might be represented by e.g., 10^{-3} (one chance in 1 000), or 10^{-4} (one chance in 10 000). Thus, the total individual risk is the sum of this excess risk and the baseline risk (for instance, individuals in Western society have an approximately 22 % baseline chance to die from cancer).

When considering not an individual, but a collective population whose members are exposed at various levels, it is possible either to compute the mean population risk (the result of averaging all the individual doses received in this population), or to calculate what is termed the *absolute risk*, that is the number of cancer cases *due to exposure* that are likely to be seen in this population. In both types of calculation, the final figure has to be compared to expected baseline numbers and both depend

on doses received as well as population size. To be complete and valid, this risk estimation must take into account other important factors like the age distribution in the population, given that we are more likely to see cancers occur in older people than in younger people.

Whether or not the results are *acceptable* is a choice made by the community after balancing the risks and the benefits drawn from the source of the radioactivity (e.g., the natural landscape where one lives, or the industrial activity). The question of acceptability of risks due to radiological exposure therefore must be addressed from a broader perspective than radiological risk assessment, with different tools and different types of discussion by a broader group of actors.

Epidemiological studies

Another way to measure risk is by carrying out epidemiological studies. As stated in the Port Hope Initiative video, an epidemiological study was carried out in this area and concluded that no differences “could be seen” between Port Hope cancer rates and those of a (unexposed) reference or comparison group. This is a precise and appropriate epidemiological statement. However, the fact that no differences “could be seen” does not mean that there are no differences at all.

The United Nation Scientific Committee on the Effects of Atomic Radiations (UNSCEAR) states that “at low doses epidemiological studies are not able to detect and quantify statistically significant radiation effects” (2). Still, provided that the study design is appropriate and the population size large enough, it is possible for epidemiologists to conclude that if an unseen difference exists, it is “small”. However, the science of epidemiology may shed light only on the effect of past exposures. While the results may be used by managers and decision makers to provide reassurance or to highlight potentially useful interventions, epidemiological results do not provide a guarantee that nothing will change in the future.

Conclusions

The biological effects of ionising radiation are fairly well known, especially their carcinogenic potential. These effects are a function of the amount of energy absorbed by the tissue per unit of time (dose and dose rate). At high doses and high dose rates, radiation can cause tissue destruction if the dose is above thresholds that vary for different organs and tissues. Below these thresholds, or at low dose rates, the biological damage is compatible with cell or tissue survival (sometimes at the expense, for example, of DNA mutations or chromosomal alterations). The effects of doses below 200 mSv at low-dose rates are still little understood (2). The existence of a threshold dose below which there is no effect remains controversial.

Humanity, it must be remembered, is continuously exposed to natural radiation at mean rate, worldwide, of 2.4 mSv/year, or approximately 170 mSv for a mean lifetime of 70 years (2). Some populations in the world live in areas where the levels of radiations naturally occurring from the environment are high and therefore, so are their doses of radiation (7).

Any risk estimate (for an individual or a population) is fraught with uncertainties, e.g. on dose calculation, dose-response relationship and so on. The uncertainties should be described and quantified when possible, and should be presented to stakeholders, allowing them to make decisions on a clearer basis. Basically, it should be borne in mind that the lower the risk, the larger (relatively) the uncertainties. When our calculations permit us to come only to a very, very small number, it is

difficult to observe with precision how that number might change if some of the givens we used came to change.

Taking into account these uncertainties, risk assessors can estimate a (plausible) upper level of risk found in a given situation. Decision makers can then rely for practical purposes on international dose limits set for instance by the International Commission on Radiological Protection (ICRP). These limits represent expert opinion on how much radiation (and therefore risk) can be allowed to workers or to members of the general population before action must be taken to limit the exposure. Decision makers in waste management contexts can consult assessment data and compare them to the recommended limits, asking: is the population of interest receiving a dose below or above these limits? However, they must bear in mind that these expert-set limits are already a social construct (incorporating choices and assumptions about risks, benefits, people's willingness to pay more for lower risk, etc.) and feature the same uncertainties as described for risk estimates. In other words, receiving doses slightly above these limits is not necessarily associated with what any person would identify as an unacceptable risk. Moreover, receiving a slightly higher dose does not mean that one is definitely going to suffer from cancer. Conversely, getting a dose below these limits is not a guarantee of no (excess) risk.

The challenge remains of how to explain these facts – measurements, assessments, uncertainties – in each specific situation to stakeholders with no scientific background who have to deal with a certain degree of exposure to ionising radiations. However, although radiation is not accessible to sensory experience (unlike temperature), several types of radiation are easy to measure for relatively cheap. Performing these measurements in their context may allow a certain degree of control by stakeholders, providing figures that are indisputable and which could help to create a common ground for further discussions.

We learnt during the workshop that natural background exposure is very limited in Port Hope. Therefore, adding a little more dose clearly leaves people on the side of acceptable risk, taking as a standard the range of natural background radiation elsewhere in Canada as well as the dose limit recommendations by the ICRP. We learnt also that the epidemiological study was considered reassuring by the municipal decision makers. What did not appear was the way exposure and doses were previously explained to Port Hope's people at large and how they felt about it. What were the questions they asked about risks, dose estimates and exposure measurements? And what kind of answers did they get?

References

1. National Research Council. Committee on the Institutional Means for the Assessment of Risks to Public Health. *Risk assessment in the Federal Government: Managing the process*. Washington (DC): National Academy Press; 1983.
2. United Nations Scientific Committee on the Effects of Atomic Radiation. *Sources, effects and risks of ionising radiation, United Nations Scientific Committee on the Effects of Atomic Radiation. 1994 Report to the general Assembly, with Annexes*. New York: United Nations; 1994.
3. Bard D., Verger P., Hubert P., Chernobyl, 10 Years After: Health Consequences. *Epidemiol Rev* 1997;19(2):187-204.

4. Bard D., Tirmarche M. *Radon*. Also in French, Russian, Estonian, Lithuanian, Latvian. Copenhagen (Denmark): World Health Organization-Regional Office for Europe; 1996.
5. ICRP. 1990 recommendations of the International Commission on Radiological Protection, ICRP publication 60. *Annals of the ICRP* 1991; 21(1).
6. Bard D., Lévesque B., Pirard P., Hubert P., Verger P., Rayonnements ionisants. In: Gosselin P., Gérin M., Quénel P., Dewailly E., Viau C., Cordier S., editors. *Environnement et santé publique, Principes, méthodes et pratiques*. Paris: TEC & DOC; in press (2003).
7. United Nations Scientific Committee on the Effects of Atomic Radiation. *Sources, effects and risks of ionising radiation, United Nations Scientific Committee on the Effects of Atomic Radiation. 2000 Report to the General Assembly, with Annexes*. New York: United Nations; 2000.

COMMUNITY INVOLVEMENT: STAKEHOLDER LEARNING IN THE UK AND IN CANADA

J. Hetherington

Community, Economy and Environment Department
Cumbria County Council, UK

Introduction

Copeland District in west Cumbria in the North-West Region of England, is “home” to the major UK (Sellafield) reprocessing plants (including THORP). The Sellafield site includes major stores for Intermediate (ILW) and High Level Waste (HLW), while the nearby Drigg national site provides a facility for the managed surface disposal of Low Level Waste (LLW). Together these facilities dominate the local economy, providing some 10 000 jobs and making a key contribution to the local economy. In the 1990s the area was also highlighted as the potential location for a national ILW deep waste repository.

This paper offers a reflection from a UK community perspective on the deliberations of the FSC Canadian Workshop. It provides, as background, an initial introductory account of: the development of radioactive waste and liabilities management policy in the UK, the significance of the failure of the Nirex RCF proposals, the success of new dialogue approaches, and the new wide ranging UK radioactive waste management consultation process.

It then compares the economic and social issues arising at Sellafield with issues identified in the Canadian programmes and experiences as presented at the Workshop.

UK radioactive waste policy and the Nirex programme

In the 1980s the UK government recognised that the nuclear industry in the UK had evolved with only limited attention given to the eventual scale of liabilities and waste management required. A House of Commons review [1] led to a 1986 White Paper [2] provided a framework for the then recently formed Nirex to progress work on siting for new LLW and ILW waste disposal facilities. This initial work, to find sites for radioactive waste disposal in the UK, was based on a policy that assumed early deep disposal of ILW and delayed (50 year) storage of HLW (in vitrified form) on the surface at Sellafield.

In its White Paper [2], Government stated it was committed to “public involvement” in site selection, and expected the industry to “pursue a policy of openness and consultation”. However, this policy was influenced by events – particularly local reaction to proposals in communities unfamiliar with the industry.

A Nirex programme to find a new shallow LLW (and short-lived ILW) site was abandoned (just prior to a general election in 1987) after fierce local protests at locations in eastern England unfamiliar with radioactive waste issues. So, in 1988 Nirex was asked to begin a fresh ILW site search process – for a Deep Waste Repository (DWR) – initially openly conducted through a wide ranging consultation on generic geological areas of potential suitability [3]. After an internal site assessment process (not made public) a decision was made in 1989 [4] to “focus” first on locations “familiar with the nuclear industry” – initially Sellafield and Dounreay. It was at this stage that Cumbria County Council became involved in-depth in tracking developments. In particular Nirex (through BNFL) sought consent for exploratory deep boreholes. In 1991 the Nirex Board decided to focus specifically on a site near Sellafield [5]. Later (as information began to emerge from the borehole work and initial modelling) it was announced, in 1993, that rather than proceeding direct to an application for a deep waste repository as planned in 1989, a Rock Characterisation Facility (RCF) would first be developed to provide “in-situ” characterisation. In 1984 local hearings by a joint Study Group provided the first opportunity to examine the procedures adopted by Nirex [6]. The County Council presented evidence to a local Hearing [7].

From this point on, poor handling of community liaison and local doubts about the siting process and safety potential of the proposed site strained relations with the County Council as planning authority for the development. After careful consideration, in 1994, Nirex’s RCF application was rejected by the County Council, leading to the decision to hold a major Public Inquiry into the scheme [8]. This happened despite earlier Council support for extensive deep Borehole investigations, resulting in a 5 month Public Inquiry.

The Nirex RCF inquiry

The Government’s Radioactive Waste White Paper [9] published in 1995 implied narrow terms of reference for any RCF Inquiry. So, when the Inquiry commenced in September 1995, site selection and safety assessment were argued initially by Nirex to be “not relevant”, and the local community was not supported in tracking the issues. The County Council spent approaching £1 000 000 from 1990 to 1997 in tracking the proposals and presenting its case at the Inquiry. The RCF Inquiry did, however, provide an almost complete review of the Nirex approach. This can be a valuable feature of UK local public inquiries, which are conducted by an independent Inspector with (for larger Inquiries) support from technical assessors.

The Inquiry lasted for 5 months, and was in two parts. Part A covered the impact of surface development on the countryside and the adjoining Lake District National Park. Part B dealt with geology, safety assessment and site selection.

The County Council presented its case around the theme “A poor site – chosen for the wrong reasons”. We argued that the site near the small village of Gosforth some 3 miles from Sellafield was a “poor site” for the following reasons. The development was argued to have an adverse visual effect both from its design and proximity to the Lake District National Park adjoining the site. This would only be acceptable in UK planning policy terms if there was an overriding need for the development. However, the Council considered that the prospects of Nirex making a safety case were doubtful, on the basis of the information available to the Inquiry [10]. The location did not offer a simple and predictable geology (the local basement volcanic rock was fractured), and the safety case relied on dilution in the overlying sandstone aquifer. Nirex’s risk predictions showed that in some cases exposures would be close to risk targets, with potential rapid return times to the aquifer – vulnerable to intrusion scenarios.

The Council also argued that the site was in effect “chosen for the wrong reasons” since the Nirex Multi Attribute Decision Analysis (made public but without naming locations) had recommended a Basement Under Sedimentary Cover site [known simply as Site 6 – but understood to be in East Anglia] as having a significant margin of safety over the Sellafield option, which had been preferred as being in an area “familiar with the nuclear industry”. We argued that the whole history of site selection was not transparent – contrary to the intention of Government as set out in the Policy. It was basically a clear case of Decide and Defend!

The Secretary of State for the Environment Refused the RCF planning application in March 1997[12] (immediately prior to another general election) because of “poor design, layout... and adverse impact on the National Park”. He also expressed concerns about the scientific uncertainties and technical deficiencies, and “the Inspector’s conclusion that site is not suitable and investigations should move to more promising site elsewhere”. He noted that the “Technical Assessor and Inspector were strongly critical of Nirex “over-optimism”, and commented that the “... site selection process has singularly failed to impress the Inspector in terms of its transparency and the rigour of its scientific logic”. He accepted the need for full disclosure on site selection at any future RCF stage.

Moving on

The outcome of the RCF Inquiry demonstrated the need for a complete rethink in the UK of the “Decide – Announce – Defend” approach, which failed to convince even “host” communities “familiar with the nuclear industry”. The new government in 1997 faced the need to review all options, beginning with reports from the Parliamentary Office for Science and Technology [13] in 1998, and a subsequent House of Lords Select Committee Report [14] published in March 1999. A UK National Consensus Conference [15] was held in May 1999, using a Citizen’s Panel to take evidence from interested bodies and experts. In 1999 BNFL launched a national Stakeholder Dialogue [16] process, and Nirex reviewed all its approaches developing a transparency policy and reviewing its deep repository concept to include a period before any backfill was introduced – a new take on the idea of retrievability. (All relevant Nirex reports are available on the Internet [17].)

It is interesting to note some of the outputs from the dialogue processes. The National Consensus Conference Citizens Panel Report concluded that, “*Radioactive Waste must be removed from the surface and stored underground, but must be monitorable and retrievable. Cost can not be an issue*”. It also stated that, “*At present there is a lack of trust and understanding and public awareness must be raised. The public needs to be fully informed of the problems and solutions available. Decision making must be open and transparent*”. The BNFL National (Stakeholder) dialogue (which includes the industry, regulators, local communities, and green groups) published a report of its “Waste Working Group” [16] supporting “passively safe, monitorable and retrievable interim storage.” The dialogue also produced a “Socio-Economic Study” of Sellafield, tracking future employment changes, which over the next 10-20 years will see a reduction in the workforce to as little as 3 000 jobs.

In 2001, a new extended Government (DEFRA) Consultation process at last got underway with publication of a consultation document on radioactive waste management, “*Managing Radioactive Waste Safely*”[18]. This focused principally on techniques of dialogue and research (Stage 1 – now ended – 2001/2). A “new body” independent of government and the industry was announced in Sept 2002, to take forward consultation on management options (Stage 2 – 2003/4) and then develop a public debate on how the decision on options should be implemented, including setting any site selection criteria (Stage 3 – 2006). The aim is to start the implementation process, including introducing any necessary legislation (Stage 4), around 2007.

Cumbria County Council (as “host” to Sellafield) has been heavily involved in the dialogue processes and made submissions to them and to the Waste Management Consultation and more recent Liabilities Management White Paper, “*Managing the Nuclear Legacy*”[19]. The White Paper, published on 4 July 2002, set out the Government’s proposals to establish a new Liabilities Management Authority (LMA) to take on the long-term role of managing all the UK’s nuclear liabilities, supported by a segregated fund or account.

We have pointed out that there is a clear need to properly manage waste arisings and liabilities (which means in practice that Sellafield plays host to surface stores of ILW/HLW for at least 30+ years). However, the Council feels that this is better than proceeding at a “poor site” chosen for the “wrong reasons”. We think there is a need for a flexible strategy based medium to long term on effective ‘management’. Options to be subject to more research should include:

- continuing managed surface storage long term;
- providing shallow managed underground storage;
- constructing deep underground stores (designed as such) in secure geological host rocks;
- constructing deep stores, but designed to allow a future generation the option for final closure (i.e. the Nirex revised option).

The Council also proposed that a radioactive waste specific national dialogue should be instituted as soon as possible, following clarification of the context for the industry (through the LMA), led by body independent of government. (As noted above, a separate new body has now been announced to do this, to be in place by the end of 2002).

Subject to detailed discussion, the Council would also wish to see government press ahead with all reasonable speed to develop a policy for safe storage of nuclear waste below ground in a monitorable and retrievable form where final closure is an option. We think the timetable (as set out in the 2002 government announcement by DEFRA) appears to provide a fair balance – allowing for a measured dialogue and making progress. We think the Cumbrian community, given its role as “host” to the majority of the UK’s radioactive waste legacy, needs a clear voice in the future development of the policy. We fear, however, that streamlined planning and parliamentary procedures (part of other recent government proposals) could restrict detailed input. Any approach adopted in the re-launched national debate should support effective community engagement and, in particular, recognise the key role of west Cumbria (all the UK LLW is deposited at Drigg, along with 2/3 of ILW, and virtually all the HLW is surface stored at Sellafield).

The County Council has recently gone on to welcome the formation of the proposed LMA, but we want clarity on its relationship to other bodies (including Nirex and RWMAC [20] – the present radioactive waste advisory body). The County Council wants the LMA to have a clear role in working with the Cumbrian community (as BNFL has for last 30+ years) in order to secure effective long-term economic and community support. This should recognise the roles of the local Council (Copeland) and the County Council in facilitating national liabilities and waste management efforts, while having regard to forecast job reductions, as reprocessing at Sellafield declines and the focus on the site shifts to liabilities management.

Reflections on the discussion at the FSC workshop

In monitoring the discussions across the 4 main sessions of the Workshop some key conclusions appear to me to have emerged which are certainly borne out from both the Canadian and my own UK experience.

The problem of managing the radioactive waste legacy can seem intractable. No country finds it easy to site and develop socially acceptable “solutions”. Environmental and economic concerns (including the simple NIMBY problem) are real issues for affected communities – even when they are “familiar” with the industry. However, “host” communities can recognise that the historic legacy needs to be managed (as we heard from the Port Hope contributors for example and saw on the site visit).

It is also clear that a “Decide and Defend” approach by remote bodies (as Nirex was perceived to be in the UK for example) will fail. This is now widely recognised both by the industry and by governments – as can be seen from Canada’s newly enacted “Waste Policy Framework” and in the UK’s new proposed 5 year staged approach.

The fact that consultations are currently underway- as in the UK - and that uncertainties exist (for example how the Canadian law will work in practice) cannot justify avoiding serious efforts to secure nationally agreed waste and legacy “management” strategies. In the UK and Canada, community dialogue techniques have been piloted to the point where they are well developed. It is also clear to me that local community and other interest groups must be supported (technically and financially) in the lengthy and complex effort involved to engage with radioactive waste management initiatives. Progressing the search for a nationally agreed and “owned”, long-term, safe, isolated storage/disposal must not be unduly postponed.

There are also particular lessons for my own Council in the UK, which I will take back from the Workshop:

- The west Cumbrian communities must be central to the debate in the UK – the bulk of the UK legacy is there – and agreed, long term, secure management must be “jointly” developed, and
- An effective locally engaged Liabilities Management Authority must be ensured in the forthcoming Act – fully integrated with the UK approach to waste management.

Reflection on the themes to be considered by the thematic rapporteurs

What specific challenges do the social concerns pose to radioactive waste management processes?

In my view, it is vital to engage elected community councils and other local interest groups in key localities (e.g. Port Hope / Sellafield) to fully engage with and share in development of possible “home grown” solutions – but these must not be technically “poor” and presume on local “understanding of” or “economic dependency on” the industry.

How do perceptions and expectations develop?

A significant threat to community engagement is any sense of presumption by a proponent as to outcomes, and any “dumbing down” of engagement. The outcomes must be open at the beginning of the process, and full and clear information must be provided. There must be “long term” working together by key staff from “developer” and “community”, and regular liaison with elected representatives and officials. The process must include genuine “alternatives” in methods and “sites” as part of the initial discussions.

How can understanding risks and opportunities be achieved between the different stakeholders?

In my view, this requires a mix of clear explanation, accessible to all *and* in depth involvement of “trusted” local actors (e.g., the Port Hope Citizen Liaison Group). Expert advisors can be involved and supported as required (for example through joint commissions to consultants from communities and proponents).

When should more importance be given to technical analyses rather than to other values attributed by actors?

In my view, any decision making will benefit significantly from being developed transparently – as an *explicit* mix of joint “fact-finding” and honest discussion of “values” based on “weighting”. Dialogue processes that involve trusted local actors can work well, but are helped by expert facilitation by specialist independent facilitators. Such facilitation has often been shown to be invaluable – for example in the UK – BNFL National Dialogue, which is facilitated by an independent charity, the Environment Council.

What balance is found between the national and local levels, between different societal groups, and between short-term and long-term interests?

Bringing many interests together to develop policy principles at national and regional scales, while considering the short and long term implications of radioactive waste approaches has proved problematic in Canada and in UK (and elsewhere). At the scoping stage (methods development and perhaps at regional geological sieve stage) progress should be possible, but there needs to be openness and a nationally facilitated approach through, for example, well- established local government groupings or community associations, and national “interest groups”. There is much more to learn yet!

However, engagement nationally on broad policy issues across a broad range of stakeholders can produce workable conclusions (for example through the UK Citizens Panel - which supported underground management, and in the BNFL dialogue - which highlighted the urgent need for passive monitorable retrievable storage). Broad, balanced dialogue should also work for involved local communities (e.g. Port Hope), though it is difficult for outline siting decisions to be agreed (objectively or otherwise). Named areas or sites need to be in the frame. (Different results can clearly emerge depending on your definition of “local” leading to policy failures, e.g. Wellenberg, Switzerland – at Cantonal, not local level).

What measures are taken and by whom to build confidence among stakeholders?

It was clear from the presentations and subsequent group discussion that there needs to be long term trust and close personal engagement amongst all key stakeholders – but this must include senior managers and staff living or being readily accessible to communities once a local site becomes identified or selected.

How effective do these measures seem to be? Are they apt to influence social trust?

We heard evidence from Canada that long-term community engagement, the use of work forces in communicating with their neighbours, and honest media coverage can help overcome bad “history” and past failure, leading to enhanced social trust.

What contributes to increasing confidence especially among the general public?

Although it can be frustrating that public awareness of scientific and technical issues (such as risk/consequence, and the nature of radioactivity, for example) is limited, Kathryn O’Hara in her presentation made it clear that proponents and others must be fully aware of how trust and risk are viewed widely in society. Recognition of the key public Risk and Trust Factors must always be born in mind in developing policy and specific proposals. Confidence will be increased if, to cite a few factors only, fairness (in selection) is evident, and familiarity within communities is acknowledged as a key benefit. It should be borne in mind that trust and understanding will come more readily from informed fellow citizens than from proponents. Safety confidence, particularly in relation to children and future generations, is a pre-requisite, reversibility should be built in, and clear explanations of the science can and should be offered without being patronising!

Are the institutions organised in a way that will let them build and maintain trust?

The Workshop has convinced me that there is clear evidence from Canada (and the UK) that lessons have been learnt and that proponents do recognise the key success factors:

- technical and social/economic concerns are not separable – but good (safe) technical solutions are a prerequisite for community support and social acceptance;
- fair processes in siting are required – communities with industry awareness will accept a role not simply on principle but *if* they are engaged in developing joint solutions; and
- an open/locally facilitated dialogue over an extended period must be built in to processes – with due recognition of the costs of engagement in the processes, and due compensation for being part of a solution on behalf of the whole society.

References

1. House of Commons Environment Committee, First Report Session 1985-6, Radioactive Waste – Volume 1, Report together with proceedings of the Committee Relating to the Report, 1986.
2. Cmnd. 9852, Radioactive Waste – the Government’s Response to the Environment Committee’s Report, 1986.

3. University of East Anglia (for UK Nirex), Responses to the Way Forward, 1988.
4. UK Nirex Ltd., Report 71, Deep Repository Project, Preliminary Environmental and Radiological Assessment and Preliminary Safety Report, 1989 “PERA”.
5. UK Nirex Ltd., Going Forward – The development of a national disposal centre for low and intermediate level radioactive waste, 1991.
6. RWMAC/ACSNI Study Group, Report on Site Selection for Radioactive Waste Disposal Facilities and the Protection of Public Health, March 1995.
7. County Council Evidence to the RWMAC/ACSNI Hearings, September 1994. Paper by J Hetherington “Site Selection and Safety Criteria for the Disposal Radioactive Waste”.
8. Report by the County Planning Officer to Cumbria County Council, April 1995.
9. Review of Radioactive Waste Management Policy, Final Conclusions, Cmnd.2919, 1995.
10. UK Nirex Ltd., Report S/95/012. Nirex 95: A Preliminary Analysis of the Groundwater Pathway for a Deep Repository (Vol. 1-3) July 1995
11. Government Office for the North West, Town and Country Planning Act 1990, Appeal by UK Nirex Limited, Proposed Rock Characterisation Facility on land at and adjoining Longlands Farm, Gosforth, Cumbria (LPA Ref. 4/94/9071): Decision letter on behalf of the Secretary of State for the Environment, with Inspectors and Assessors Reports, 17th March 1997.
12. Parliamentary Office of Science and Technology, Radioactive Waste - Where Next? November 1997 – see: <http://www.parliament.uk/post/9711.htm>
13. Cumbria County Council, Evidence to the House of Lords Select Committee – published on the Cumbria County Council Web Site (www.cumbria.gov.uk).
14. House of Lords, Select Committee on Science and Technology, Report: “Management of Nuclear Waste”, 10 March 1999, The Stationary Office – see: <http://www.parliament.the-stationery-office.co.uk/pa/ld199899/ldselect/ldsctech/41/4101.htm>
15. Final Report of the UK National Consensus Conference on Radioactive Waste; ISBN 0 948729 317 1999 105pp available from UK CEED (£10.00) or on-line <http://www.ukceed.org/>
16. The Environment Council, BNFL National Stakeholder Dialogue, Waste Working Group, Interim Report, 28th February 2000 – follow link from: http://www.the-environment-council.org.uk/dialogue/mn_dialogue_casestudies_bnfl.shtml
17. A Bibliography of Nirex Science Reports, Inquiry Evidence and subsequent policy statements are available at <http://www.nirex.co.uk/ipublic.htm>
18. UK Government (DEFRA) Consultation – “Managing Radioactive Waste Safely, 12 Sept. 2001 – see Introduction and link from <http://www.defra.gov.uk/environment/radioactivity/waste/index.htm>
19. UK Government (DTI) White Paper *Managing the Nuclear Legacy*, Cm 5552, 4 July 2002 – see <http://www.dti.gov.uk/energy/nuclear/environment/liabilities/index.shtml>
20. For RWMAC reports and advice to government see: <http://www.defra.gov.uk/rwmac/>

STAKEHOLDER CONFIDENCE: OBSERVATIONS FROM THE VIEWPOINT OF ETHICS

P.A. Fleming

Senior Associate Dean and Associate Professor of Philosophy
Creighton University, Omaha, Nebraska, USA

Discussions among the participants of this Forum on Stakeholder Confidence Workshop as well as the Canadian Context and field trip to the Municipality of Port Hope and Clarington often turned to foundational social concerns in radioactive waste facility siting. Intertwined in these topics were less obvious but persistent ethical concerns. Below I articulate some of these ethical issues. I do this by describing four observations I made throughout the week. I suggest that these observations be examined from the viewpoint of ethics and reflect on their complexity. I initiate this paper with a preliminary discussion of the expression “ethical assessment” referred to throughout the workshop. This expression is key to Canada’s new Nuclear Waste Fuel Act (NWFA) requiring proof that this type of assessment occurs in the consideration of potential concepts and hosts for the disposal of nuclear waste.

Ethics and “ethical assessment”

Talk about ethics always has a tendency to lean in the direction of ambiguity. Recognising this from the outset is enormously important in making progress on finding an ethically acceptable solution to a moral problem.

Descriptive and prescriptive ethics

The ambiguity lies in the simple distinction between the descriptive and the prescriptive. Descriptive ethics involves giving an accurate portrayal of the moral values held by a particular person or social group. It is fundamentally an anthropological activity, involving the study of human value systems. Prescriptive ethics, on the other hand, entails the making of a moral judgment, based on fundamental ethical principles, virtues and the like. At their best, such judgments are accompanied by a justification, sometimes simply stated but often complex, involving empirical claims, resolution of conflicting values, and argument for the priority of some values over others. This is fundamentally a philosophical activity.

It’s easy to confuse these two meanings of ethics, even to the point of equivocation. The reason for this is simple: in descriptive ethics, what is being described are prescriptive beliefs and sometimes their justifications, i.e. reasons people have for holding such beliefs. However, no additional judgment is made nor is justification given by the person doing the describing. Descriptive ethics results in statements about what values we do hold.

In prescriptive ethics, one might be interested in finding out about the prescriptive beliefs held by a community or individual but only insofar as those beliefs are subject to the additional tests of

justification in which some prescriptive beliefs are said to be better than others, i.e., more coherent, non-contradictory, based in a value that should take priority. The person doing the prescribing does make an additional judgment and should be able to give some justification. Prescriptive ethics results in statements about what values we ought to hold.

Descriptive ethical assessment

The expression “ethical assessment” can certainly also lean in the direction of ambiguity. What does it mean to engage in this activity with a citizen, a host community, or a nation, as a requirement for successful radioactive waste facility siting?

Does it mean that I must survey the values of the stakeholders and describe them accurately? In so doing, I might find out that certain values or value emphases differ from community to community. I might discover, for example, that Aboriginal peoples value entities in nature and therefore treat them differently than do urban populations whose relations are distanced by location and production processes. I might find that value judgments initially uttered by citizens or their representatives shift over time with knowledge, experience, and the provision of a good. In making these discoveries and recording this information, I am engaged in ethical assessment in the descriptive sense. This activity should not be undervalued. This type of ethical assessment can strengthen stakeholder confidence because it requires attention to local values.

The intent in discovering local values may be to respect them such that a nation would provide measures to protect them in radioactive waste management through accommodation in the siting process. An example of this is demonstrated by the industrial management strategy in Trinity Bay presented at the FSC by Professor Ken Storey (this volume). Or, respect might be shown by abandoning potential host sites because local values would be threatened. These actions no doubt strengthens stakeholder confidence a hundred fold. What better evidence could stakeholders have for believing their autonomy is respected or their judgment trusted? Still, such ethical assessment remains descriptive but what underlies it is a prescriptive view about how a nation “ought” to engage in radioactive waste facility siting.

Prescriptive ethical assessment

Yet, like “ethics”, the charge to engage in an ethical assessment can also have a straightforward prescriptive meaning. If I go a step further¹ and provide an ethical assessment by analysing competing values and principles, subjecting local and national values to scrutiny, I am engaged in ethical assessment in the prescriptive sense. As a regulator, legislator, or citizen, my intent is to find the “ethical” or “morally right” or “least morally problematic” action, policy, or program for the various aspects of radioactive waste facility siting.

The Port Hope experience provides a good example of this important distinction and how both meanings of ethical assessment can be brought together in a stepwise process. In listening to and articulating the Port Hope Township’s experience with the decision to accept long-term management of low level radioactive waste within its urban boundaries, we participants were engaged in the anthropological work of descriptive ethics. We heard Mayor Austin and others describe a sense of

1. “Further” implies that prescriptive ethics relies on descriptive ethics. This is not always the case. I might not take any steps in the direction of anthropological work before providing a statement about what ought to happen. Whether this is acceptable in nuclear waste siting is a matter of political expediency.

moral obligation or duty to manage the waste locally. This duty in part derives from their belief that, having reaped the financial benefits (employment, support and growth of local economy, etc.) over many years from Cameco's uranium conversion facility, they have the obligation to accept the waste. They reasoned that this responsibility should not be shifted to other municipalities or rural areas, particular since any future risks associated with disposal would not have been offset with past benefits. We also learned that compensation for accepting any future risks figured importantly in their moral calculus. The Port Hope community has ethically assessed their options in the prescriptive sense. We, as outsiders, found ourselves engaged in ethical assessment in the descriptive sense.

But, some observers could not help but ask, "Is there a better solution for the low-level waste found inside the dense urban boundaries of Port Hope?" Would a more centralised location at nearby areas but within the newly-formed Port Hope Municipality be ethically preferable? If overall risk (an assessment which needs to be made) was reduced by centralisation, shouldn't the transfer of waste to the nearby, rural location be encouraged? "

This example helps to understand the ambiguity in these expressions and the possibility of sliding back and forth between the descriptive and prescriptive. In sharing my observations below, I will be acting both anthropologically and philosophically. I slip in and out of the descriptive and prescriptive, but without equivocation.

Observation 1: Stakeholder confidence is aligned with political expedience rather than with ethical duty

Many conference participants at this workshop on stakeholder confidence expressed a desire to tackle the ethical issues that surround radioactive waste management. One that surfaced intermittently is intergenerational equity. Associated with this concern is the question of the present generation's obligation to future generations. This is an issue with which participants appeared to have some familiarity. Participants expressed interest in tackling additional, unidentified ethical concerns in radioactive waste management. "Enough about stakeholder interests. We need to be looking at the ethics of all this" said one of the participants.

From the viewpoint of ethics

Some participants did not connect concern with stakeholder confidence to ethics but rather to political expediency. Having observed nations fail in finding solutions to radioactive waste, especially those that did not take seriously stakeholders' interest, some participants described the theme of this conference primarily in an instrumental way. They expressed hope that a focus on stakeholder confidence might finally help them move closer to a decision which they desire. But, stakeholder confidence should also be identified as an ethical concern. In this light, fruitful analysis can be given to duties toward stakeholders. What are they and who has them? Are they the result of stakeholder rights? In other words, are moral duties to stakeholders grounded in moral rights they hold, e.g a duty to inform stakeholders about risks because they have right to decide in an informed way regarding acceptance of those risks. Or, do duties exist toward stakeholders, whether or not they can successfully advance a claim to some corresponding right? or do they exist despite any correlativity between rights and duties? Do they involve positive duties (to provide some good) or negative duties (to prevent harm)? Further identification of who should assume these obligations (e.g. industry, regulators, legislators) can be made to avoid incorrect assumptions.

Complexity

There may not be moral agreement that duties exist toward stakeholders. In fact, this rapporteur sensed some minority disagreement among some participants over the value of seeking stakeholder involvement and confidence. It is important to realize that denying the existence of a duty to stakeholders might have some moral legitimacy, i.e., it is a position that might find justification in a moral principle such as non-maleficence or prevention of harm to the larger community and as such should take precedence over autonomy or respecting local stakeholder concerns.

Hence, it would behoove those who value stakeholder confidence to articulate the underlying moral principle or value that supports it and to recognise competing moral principles that permit others to dismiss the need for stakeholder confidence. Identifying stakeholder confidence as an ethical issue would encourage this important discussion.

Observation 2: Interest in process reflects an interest in ethical means

Many times throughout the week, remarks were made about the importance of process in solving radioactive waste problems. Process was taken to mean a number of things ranging from quality of the interactions between stakeholders, regulators, and the industry to transparency in decision-making. Its focus is on “how to” achieve successful radioactive waste facility siting, i.e., on the actions that can and should occur along the route.

From the viewpoint of ethics

An emphasis on process can be translated into ethical terms as a belief that concern with the end is not sufficient; the means by which we achieve an end must themselves be ethical. If those means should involve stakeholder involvement, as suggested by the existence of the Workshop series, it would be helpful to articulate why so, in the ethical sense. Perhaps this is because respecting the autonomy of individuals affected by an action is deemed morally relevant and ultimately requires informed consent. If stakeholder confidence is achievable by various non-coercive means by which a high degree of information and non-coercive consent results, this may be preferable that focusing only on outcomes or the end.

Complexity

It is wise to keep one’s ethical gaze on the end as well as the means. In fact, in the Canadian context, ethical assessment is required for enhancing the end result as well as enhancing the process.² The following are all possibilities in radioactive waste facility siting:

- good means to a good end;
- good means to bad end;
- bad means to good end;
- bad means to bad end.

2. See *Nuclear Fuel Waste Management and Disposal Concept Environmental Assessment Panel* (known as the Seaborn Panel) report.

We can think of many examples in environmental waste disposal where stakeholder confidence is achieved but an unsafe site or concept is chosen, or where coercive means are used to achieve a decision on a safe facility and site. Clearly, the discussion above about whether stakeholder confidence is even morally relevant to achieving a good end hints at the view that if the end is good we need not concern ourselves with the means. This cannot be determined in the abstract. In some situations we might argue that means are indeed irrelevant; in radioactive waste facility siting we have come to appreciate the need for presumably good means, i.e., processes building stakeholder confidence, but we might also have to keep a productive tension between ends and means. No amount of confidence building and any subsequent decision to accept the risks associated with disposal of radioactive waste can replace the end in sight, i.e. a siting program that insures safety, albeit relative in character.

Observation 3: Beliefs about moral significance play a hidden role in the desire to ensure that all relevant interests are accounted for

Throughout the Workshop, participants expressed concern that in the siting process a variety of interests be taken into account. Attention to the local needs and concerns of the citizens of Port Hope Township was reflected in informing the citizenry of risks to health and safety associated with local waste management and seeking their consent. At the same time the national, if not multinational, need to find an acceptable site for both high and low-level waste was apparent throughout the proceedings. In fact, it appears fortuitous and timely that Port Hope expressed willingness to consider hosting low-level waste, relieving the national need to continue pursuit of a local solution to a regional and national problem. The presentation of P. Larcombe focused our attention on needs and interests of Aboriginal communities, eliciting an understanding of their relation to and interest in the environment. Many participants raised concerns about the needs and interests of future generations. In sum, the participants of the FSC expressed concern about the multiple levels / types of needs and interests and some question about which should take priority.

From the viewpoint of ethics

The FSC participants' concern can be understood, in ethical terms, as grappling with the difficult task of determining who should "morally count" or be accorded moral significance in resolving radioactive waste facility siting. For example, we might all easily agree that current human interests and needs must be taken into account.³ But, when we begin to talk about the needs and interests of non-existing entities, i.e. future generations, we might not all be in complete agreement. Of course, there will be disagreement on how those needs are best met, but whether we should even take them into account must first be agreed to. Can non-existing humans have moral significance? Even more questionable for many is the moral significance of non-human entities, such as the flora and fauna found in nature, which can be construed to have needs and possibly some interests. Do the entities that live near or at potential host sites have moral significance? Many Aboriginal communities place intrinsic as well as extrinsic value on bears, ravens, eagles, wolverines, fox, otters, and the like. What does respect for the local interests of Aboriginal communities mean? Are we meant to respect their values or to adopt the values they have, which may include attributing moral significance to non-human living entities? Finally, what are we to make of the value we should accord the preservation of shorelines, water bodies, and rock formations?

3. We haven't always agreed to this, insofar as our societies have tolerated actions that suggest one's ethnicity, gender, age, etc., enhance or detract from one's moral significance.

Many nations require EIAs (Environmental Impact Assessments) prior to actions that will affect the environment. These are primarily driven by anthropocentric (human-centered) interests. But, a new societal interest is emerging in the intrinsic value of other living things (biocentricism) and for the environment itself (ecocentricism). Accountability for the needs and interests that surround radioactive waste siting depends, from an ethical viewpoint, on whether national policies require an anthropocentric, biocentric, and/or ecocentric position on moral significance.

Complexity

Once a nation, through its policies, has decided on which interests should be taken into account, the question remains as to how to prioritize these needs and interests. This is generally considered to be a problem solved by “politics.” But, prioritisation is also a fundamental ethical problem. This is an important question, for example, in an ethical assessment that seeks to be prescriptive (see above). If local values, expressed in needs and interests, clash with national needs and interests, which should take moral priority? Should the current concern with the protection of future generations trump or overrule the current concerns of locales, regions and nations, should they clash? Why should the values held by Aboriginal peoples take moral priority over the value to safely dispose of nuclear waste, should these values conflict?

These are exceptionally important questions. Their answers depend only in part on credible empirical or scientific information. Basic moral commitments about moral significance will drive these answers. Distinguishing between needs and interests should be part of the moral calculus, if needs are deemed to have moral priority over interests. And, ranking of moral principles or virtues will also inform the moral priority to be given to some radioactive waste management solutions over others.

Observation 4: Differences among nations need not conflict with the world-wide interest in finding common moral wisdom regarding best moral practices in radioactive waste management

Several observations I noted in my oral presentation at the FSC can be combined. On the one hand there seemed to be a strong belief that attention should be paid to difference in social concerns between countries, stakeholders and locales. Differences were highlighted as a distancing move when national representatives did not see the viability of each other’s programmes or proposals. Similarly, when the word “ethics” occasionally surfaced in conversations, it was often accompanied by the belief that right from wrong was not possible to ascertain or, if so, it was relative, not absolute. At the same time, there exists considerable agreement over the value of the NEA’s decision to hold workshop forums on stakeholder confidence throughout the world, reflecting the belief that some common moral wisdom can be shared. And, for all the talk of disagreement over right and wrong in the moral sense, participants worked very hard at seeking “best practices” in radioactive waste management.

From the viewpoint of ethics

It is not at all uncommon to see ethical relativism rear its ugly head when people try to tackle a difficult moral problem. When differences on how to ethically resolve the task of radioactive waste management become apparent, rather than confront the differences, we often resort to statements that affirm the difference for fear that, at least publicly, we are not reflecting moral tolerance. But in the less public arenas of hotel lobbies, small dinner parties, meetings over drinks, and in the restrooms, the moral debates continued. One question being debated in the less public arena is noteworthy: Should

we be seeking multi-national solutions for nuclear waste disposal, rather than each country finding its own? This question has its analog for countries, like the U.S.A. and Canada, wherein its citizens question the moral wisdom of transporting waste to a centralized location because doing so (presumably) favors the safe disposal in an appropriate rock body. At the same time centralization might require the assumption of (additional) risk for which no clear or direct benefit, other than compensation, exists (in contrast to the Port Hope situation). Another question raised inside the official public forum but debated more extensively in less public arenas is the requirement of compensation to the host locale. Finland has been successful in securing agreement over a host site without offering direct compensation. Port Hope's agreement requires financial compensation. Some nations have conditional compensation clauses in their policies. Compensation may be considered a politically expedient strategy but should it be a moral requirement?

These are examples of the tendency opposing ethical relativism and the belief that the strong differences in social concerns among nations should rule the day. That tendency is to try to find solutions that do not simply rest in local values or mores but in best practices founded in more universal principles.

Complexity

Confronting differences and tackling the difficult ethical issues in radioactive waste management first requires facing some more complexity. What can result, however, is a clearer moral vision on why the differences exist and what deeper held moral values are informing those differences. There is the very real possibility, in this clarity of vision, on moral agreement. Residual but important disagreements then can be properly attributed to empirical matters that may need further study.

For example, is a multinational solution a better solution because it achieves less harm (non-maleficence) to those living near aging reactor sites or more good (beneficence) to the nuclear industry and the citizens of nations that are dependent on nuclear reactor generated power? Are both of these values achievable, but at the cost of abrogating the freedoms of stakeholders living close to host sites? Is that abrogation diminished by education, consent, and compensation?

The table below elucidates some of the non-reducible ethical principles and their attendant virtues that inform the complexity involved in seeking an ethically defensible solution to radioactive waste management.

Principles	Virtues
Respect for autonomy	Respectfulness
Non-maleficence (Prevent harm)	Non-malevolence
Beneficence (Provide good)	Benevolence
Justice	Fairness
Veracity	Truthfulness
Fidelity	Trustworthiness

The existence of the Forum on Stakeholder Confidence appears to be implicitly informed by some of these ethical principles or virtues. Differences may exist in the prioritising of these principles or virtues when they clash, but even then, such differences should be subject to rational justification.

My recommendation, at this point, is neither the adoption of any particular principle or virtue nor its priority. Rather it is that the NEA, through the Forum on Stakeholder Confidence, continue on its path of avoiding an ethical relativism or skepticism in finding some common moral wisdom in radioactive waste management. Don't avoid the ethical discussions. You are already in the midst of them and the participants at these workshops certainly have the analytical skills necessary to engage the moral dimensions of this world-wide challenge. It is a matter of further developing a way of thinking about this challenge, giving credence to our ability to seek rational, well-justified solutions, based on good evidence of judgments of risk and awareness of the values that inform those judgments.

It's been a privilege for me, as a philosopher, to observe your good intentions, your thoughtful concerns and your (sometimes unrecognised) attempts to arrive at ethically defensible solutions to the challenges of radioactive waste management. In your need for a politically expedient solution, in which stakeholder confidence plays a significant role, please acknowledge the moral high road of reflection and action on which you are already embarked.

BUILDING RELATIONSHIPS WITH THE WASTES

M. O'Connor

Professor of Economics

Centre d'économie et d'éthique pour l'environnement et le développement

Université de Versailles Saint-Quentin-en-Yvelines, Guyancourt, France

Introduction

As a part of the attempts at synthesis or, at least, some overviews of issues raised, I was asked to give a sort of social sciences perspective centring on the question of stakeholder deliberations. A list of nine themes was given (in the original Programme; I will not re-list them here) and I address them all, to some extent, explicitly or in passing through. The discussions of the preceding days were very rich, and in the talk I tried to offer some suggestions about fundamental societal challenges for the long-term management of radioactive wastes, based on my appreciation of Canadian experiences and points of view expressed during these days.¹

The text that follows is not a transcript of my talk. It is, however, directly based on the plan that I had made for my presentation and the notes that I had made during the Workshop. The sentences and sometimes the ordering of ideas are no doubt different. But I have not tried to add any ideas that were not already somewhere in the talk, simply expanded a few paragraphs that, in the talk, were sandwiched together with semi-colons due to the watchful scrutiny of time.

In a few places, I signal specific points from the Workshop discussions that stimulated a part of my comments. But there were many valuable remarks of wisdom and I cannot cite them all verbatim. If, by inadvertence, I have made an unjust deformation, please accept my apologies.

The dose and its social significance

This Workshop is mostly centred on matters of communication, dialogue, social relationships, attitudes, questions of confidence and (mis)trust. This to the extent that some people – in the nuclear sector, in decision making circles, or looking from the outside – might be tempted to say, yes, this inter-subjective stuff is all very well; but what about the scientific objective foundation for waste management decisions?

1. My last visit to Canada was in 1965 as a child. When I went to school in Guelph, Ontario for a year and learned the geography of the Great Lakes, I did not take any particular interest in Port Hope and Serpent River, nor Pinawa, Ottawa and other places that, thanks to the Workshop participants, I now know a little bit about. My sincere appreciation to the NEA and to Natural Resources Canada for having given me the opportunity to participate in the Workshop.

It is not a question of *either/or* science and social relationships are necessary. As indeed is plainly stated in the conclusions of the Canadian Environmental Assessment Panel's report, technical/scientific quality is necessary but not sufficient in the satisfaction of societal concerns concerning radioactive wastes management.² There are requirements other than scientific and technical quality, and irreducible to the latter alone, for the satisfaction of legitimate social concerns.³

In the domains of risk management, environmental governance, and integrated environmental assessment in which habitually I work, it is often useful to consider two sides to knowledge of a problem: the side of *systems science* and the side of *social signification* (e.g., the meaning and weight attributed to something). Philosophers are fond of arguing that "you cannot deduce an *ought* from an *is*". Economists distinguish the analysis of what is or might be *feasible* (the supply side) from the question of what is or might be *desirable* (the social demand; but the question will arise, desirable why and according to whom?).

To simplify, I will say that the systems science side addresses the *ways and means* of controlling the exposure of present and future generations to radiation, relative to what is considered safe or otherwise satisfactory. Systems science, drawing on various aspects of physics and chemistry, biology, epidemiology and what have you, will also advise on what should be considered a safe level of exposure (and why...). This, if you like, is the *material* question of the *dose*.

Can we deduce from statistics and scenario speculations about the present and possible future levels of exposure, what "should" be done? The short answer is no. The significance to an individual, to members of a community, to a society of exposure (or a danger of exposure) to a *dose* depends very much on how, by whom and why the dose has been produced. Correspondingly, there are many different ways that a society might set about to *watch over the wastes*. In particular, waste management strategies may differ considerably as regards the *relationships* (in social, economic, cultural and symbolic terms) that they establish between the people – individuals, classes, interest groups, succeeding generations, whole nations – implicated in the situations of production, storage and monitoring of the wastes. This *social dimension* cannot be deduced purely from technology and the medical and bio/physical information set.

The key components of a waste management solution

What then is the *social dimension* of the radioactive waste management problem? This FSC Workshop is placed in the Canadian context and quite a lot of discussion has focussed around the experience of the communities of Port Hope. I want to start from some empirical observations (which in a minute I will build into a theoretical suggestion).

-
2. I refer here to the Nuclear Fuel Waste Management and Disposal Concept Environmental Assessment Panel, which carried out its investigations during 1992-1998, chaired by Mr. Blair Seaborn (who gave a very clear succinct exposition earlier during the Workshop).
 3. I insist, to avoid possible misunderstanding, that scientific knowledge quality is an irreducible criterion. Radioactivity of wastes is a material phenomenon and, even if a solution were merely agreed by all members of society that neglected technical concerns, there would nonetheless remain, in the words of the Argentinian writer Jorge Luis Borges, "the problem of the material of some objects" (Jorge Luis Borges, "Tlön, Uqbar, Orbis Tertius", pp.27-43 in *Labryinths: Selected stories and other writings*, English translation edited by D.A. Yates and J.E. Irby, Penguin Books, Harmondsworth, 1970).

What we see vividly, and has been explained through the presentations at this Workshop, is that the Port Hope (and neighbouring) communities have set about to *build a social — and societal — relationship with the wastes*.

We see – emerging from more than 20 years of inconclusive discussions, suggestions and deliberations – the clear affirmation by the Port Hope community that it accepts “ownership” of the contamination problem. It is a *historical liability* that the community accepts, indeed *affirms as a part of its identity*. In this regard, it is significant that the community has refused certain proposed solutions for long-term waste management that depend on expertise and knowledge that they feel is not sufficiently accessible to them – that is, that would place the problem “out of their hands”. The community rejects a solution concept, argued by some experts to be technically superior, for “disposal” of the contaminated material in a cavern hollowed out under the lake. For various reasons (which I will not try to explore here) they do not completely trust this solution. They prefer a *solution that they can see and understand*, one that – indeed – will accommodate the radioactive wastes as modern-day burial mounds and middens. The wastes, piled together and suitably “capped”, will become landscape features integrated into the everyday life of the community.⁴ The managed wastes thus become features in a kind of theme park, this becomes (it is hoped) a tourist draw card rather than a reason to shy away.⁵

This “appropriation” of the waste/contamination problem by key “local” stakeholders – that is, their affirmation of a willingness to take action and also the identification of a solution concept *that they can live with* – is a necessary ingredient for the economic, social and political viability of a

-
4. Our civilisation is now knowingly constructing the “sites” that will be observed and assessed by later civilisations, as the durable traces of our current way of life. In a sort of post-modern irony, we are thus creating the relics for later generations of archaeologists. This raises the question, are the Port Hope storage/disposal sites to be considered as analogous to ancient burial mounds, or as a new form of trash mound? Archaeologists use the term “*barrow*” to designate a variety of forms of burial mound that are features of sites of prehistoric civilisations.

According to one source (<http://www.henge.org.uk/general/glossary.html>), there are two main sub-types: the long barrow and the round barrow. Long barrows are generally Neolithic structures and the round barrows generally Bronze Age or later. The long barrow is an elongated roughly rectangular structure and may contain many burial chambers. Many long barrows appear to have been in constant use with burials being added over a period of centuries, the old bones being moved around to accommodate the new interment. Round barrows, more common than long barrows, typically contain only a single burial or two or three individuals. A typical example would be a roughly hemispherical mound formed by piling the earth up at the centre of a circular ditch. Building material varies according to location; if there was only thin topsoil then the mound might be formed by piling boulders into cairns. Another type of round barrow is the pond barrow formed by digging the earth out from the centre of the site and piling it up in a bank around the site. The central area would then be used for burial. The “*midden*”, by contrast, is the term used for soil incorporating decomposed food waste (including shell and animal bone), ash, charcoal and other organic debris, and tools and other living debris, built up at places where people have lived or worked (<http://www.statemuseum.arizona.edu/azsite/featerms.shtml>). “Shell midden”, for example, is midden soil with significant quantities of shellfish shells, characteristic of coastal settlements. Middens may have considerable depth, or may be thin layers (called “sheet midden”).

5. I will return later on to the (justified) objection that, even if the theme park concept might work for Port Hope, it is not necessarily an appropriate solution concept for the bigger problem of long-run management of large quantities of high-level radioactive wastes. The point is that, once it is admitted that relationships will (one way or another) come to be built and maintained, one can ask the question – political and sociological at the same time – whether and to what extent the “forms of relationships” and the conventions and mechanisms by which they are established and maintained, are, or can be made, and should be, matters of societal choice.

solution. Equally necessary is the engagement of the relevant national authorities, establishing a *political/economic partnership*, as now is visible in the terms of the *Port Hope Area Initiative* bringing together the complementary local and national resources and forms of authority. So, if we take Port Hope as an example, we see that there are three key components for a viable solution to a radioactive waste management problem. These are:

1. The Science Dimension – Capacity to Measure and to Manage the Dose: the development and maintenance of scientific knowledge and technical competency to measure and to control the present and eventual exposure of living beings to radioactivity.
2. The Social Dimension – Building Social/Societal Relationships with the Wastes: the envisaging and invention, in social and symbolic terms, of how the relevant community (or communities) will relate to and interact with the sites and the wastes.
3. The Building of Political/Economic Partnerships: permitting to mobilise the relevant knowledge and resources for the implementation of an agreed societal solution to the disposal and watching over of the wastes.

I suggest the value of an explicit reappraisal of the history to date of radioactive waste management around the world, in terms of these three components.

The first component, the technical/scientific aspect of responsibility for “managing the dose”, is clearly present since at least the 1950s, in the objectives and statutory obligations for radiation security in the handling of raw and refined fuels, the operation of nuclear power stations and the storage and disposal of radioactive wastes.

Concern for the third component, partnership building, has emerged since the 1980s as a pragmatic response by public authorities (and, sometimes, by nuclear industry actors themselves) confronted by the ineffectiveness of the standard technical expertise model for viable waste management decisions. In particular, confronted by public disquiet about the risks associated with radioactive waste and the very long time frames involved in monitoring its disposal, the authorities have turned to various forms of “stakeholder consultation” (etc.).

The initiatives for stakeholder participation are sometimes ambiguous. The empirical experience of the past 20 or 30 years reveals, for the majority of countries directly concerned by an obligation of radioactive waste management associated with nuclear energy production, an incontestable “*deficit*” of *stakeholder confidence* concerning the decisions proposed by the established expert and government bodies for the “long term disposal” of radioactive wastes. For example, in each of the UK, France, Germany and Canada, public outcry and dispute has forced the abandonment of envisaged programmes and/or a major reconstruction of the institutional and policy framework.⁶ Emphasis is placed now on transparent and inclusive *processes* for exploring the basis for a solution that society sees as satisfactory – in every case with an increased emphasis on stakeholder

6. I do not try to document this empirical record. If there were not this deficit of stakeholder confidence, the NEA Forum for Stakeholder Confidence would not have a reason to exist. Some elements of overview are found in the NEA’s FSC documents. Elements of my own appraisal, to date, are contained in a paper (in French) by S. Faucheux, C. Hue & M. O’Connor, “Déficit de (quelle) démocratie? Analyse comparative des formes de participation publique dans les processus de décision pour la gestion des déchets hautement radioactifs”, to be delivered to the Conference of the Institut Européen de Cindyniques on the theme of *Activités à risque et démocratie: vers de nouvelles formes de gouvernance*, Paris, 17–19 March 2003.

participation on public debate and deliberation and thus the building of a prospect for social acceptance of an agreed and understood long term management strategy.

But, is the objective of this consultation/participation/concertation merely to find ways to better inform and thereby convince or persuade a recalcitrant public, so that they will finally *accept* an existing “disposal” solution? Or, does it involve a more fundamental reconsideration about “what is the problem” and how it should be solved?

In terms of the three point schema that I have just outlined, a reconsideration of “what is the problem” is certainly to the point. And, I believe, this is what is already actually taking place. Stakeholder consultation and partnership (etc.) are not ends in themselves, they are procedures for achieving goals or implementing policies. Even if we adopt the view, in political philosophy terms, that “good political process” is *necessary* for achieving a good and socially legitimate outcome, it is not enough on its own. Society must discuss the goals as well as the means for achieving them (the two are intertwined).

This brings me back to the second component in the schema, the *social dimension* of any agreed solution for watching over the wastes. I have framed this as the question of *the nature of the relationships to be established and maintained by society with the sites and the radioactive wastes*.

A discussion of this component is rarely evident in authoritative discussions of disposal and management options. But this is not because it is absent. Rather, it is because a specific answer – the type of “relationship” envisaged – has already strongly been presumed and *taken for granted*. Because it is taken as already given, it does not need to be discussed.

I refer here to the concepts of *containment* and of provisional and permanent “*disposal*” of wastes through the competent action of an authority, respecting the precept of modern-day rubbish disposal, “*Out of public sight, therefore out of the public’s mind*”.

During the past half a century and still at the present time, there are many different long-run waste management solutions being bandied around. These range from deep sea disposal (exploiting tectonic plates and dilution factors) to deep space disposal (dependent, however, on satellite launches that are known to have certain dangers), with a variety of land-based solutions.⁷ Across the variety of suggestions, three points are striking.

- First, the solutions are almost always presented in essentially *technical* and not social terms.
- Second, the solution ideal is almost always final disposal, that is, the definitive *isolation* of the noxious materials to prevent them from (re)entering into contact with human society.
- Third, the expectation is of an authoritative implementation of this provisional or permanent isolation by a competent authority.

This three point characterisation fits with a well known industrial model of public order and public health, in which comfort and safety of the public are assured by technological means

7. For example, the recent UK discussion documents list up to ten distinct solution concepts, most of which are quickly put to one side.

implemented by a delegated authority, through the controlled collection and then expulsion of the noxious elements outside the society. I will call this the “Modern-model rubbish dump” concept.⁸

In effect, since the 1950s the prevailing solution concept for radioactive waste disposal was the operation of a suitably designed and situated “Modern-model rubbish dump”. As such, the solution was framed in essentially technical terms, and its implementation was not seen to involve directly the public. So it was perhaps not realised that, in general, the *social dimension* and the *scientific/technical dimension* of societal problem solving are complementary but distinct.

Note that I am *not* saying that the solution concept “*out of public sight, out of the public’s mind*”, when formulated (from the 1950s) for radioactive waste disposal, was necessarily a wrong one. What I am saying is that, whatever the expert and societal situation 40 years ago, the public *today* does not have much confidence in this model when applied to long-lived high activity radioactive wastes.

This lack of confidence arises partly from the accumulation of experience with nuclear energy, radiation and wastes (including notably, with the difficulties of long term and secure containment) and partly in the wider context of our societies’ increasing awareness of the myriad, often uncontrollable and often long-lasting, side-effects of technological (physical, chemical, genetic, ecological) inventions.⁹

It was perhaps not realised (or was forgotten) by the nuclear scientists and technical experts doing their jobs, that changing political realities and societal concerns can require reappraisal – sometimes quite radical reappraisal – of originally envisaged technical solutions and that, in such circumstances, dialogue and discussion with the public might be desirable, even necessary, in order to assure the identification of a robust and appropriate solution concept. What I am suggesting is that, whatever the lapses of the past, such dialogue and discussion – an open societal deliberation – are now overdue.¹⁰

“Watching over the wastes” – what societal model?

The “Modern model” for radioactive waste disposal has proven inadequate. It is socially unacceptable in the very palpable sense that by and large, the “public” does not have confidence in this

-
8. A waste is any sort of product or by-product of economic activity that is in surplus relative to society’s needs. Traditionally, according to the “Modern-model rubbish dump”, it suffices that the society invest some effort in collection methods, organisation and transport services, and it is possible, once and for all, to get rid of the wastes. As long as the members of society follow the rules (about “putting out the rubbish for collection”), they do not have to think about what happens next.
 9. The literature on this last point, the “unintended effects” associated with modern technology and the pursuit of modern societal goals, is very large. Two short articles that discuss the new challenges for science practice and political process in relation to technological and environmental risk assessment are: Gallopin, G., O’Connor, M., Funtowicz, S., Ravetz, J., 2001, “Science for the 21st century: From social contract to the scientific core”, *International Journal of Social Science*, 168, June 2001, pp.219-229. [Traduction française: « La Science pour le XXI^{ème} siècle : du contrat social aux fondements scientifiques », *Revue Internationale des Sciences Sociales*, 168, June 2001, pp.239-250]; and Faucheux, S. & O’Connor, M., 2000, « Technosphère vs. Ecosphère. Choix technologiques et menaces environnementales : signaux faibles, controverses et décisions », *Futuribles* No.251 (mars 2000), pp.29–59.
 10. 50 years of not realising may seem a long time. But, we shouldn’t be too harsh, a lapse of attention by one or two generations is nothing at all compared with the typical average lifetimes of radioactive wastes. Fortunately, we still have some time to address the problem.

solution concept. This absence of public trust clearly matters because it is, in a variety of ways, obstructing or making impossible the putting into place of the envisaged solution.¹¹

I have tried in the preceding section, to offer a simple framework for examining why, and on what points, there is a lack of stakeholder confidence concerning decisions about the management of radioactive wastes. Refusal to place one's confidence in decision makers and experts can have many origins. In this case, there are certainly doubts expressed by some sectors of our societies that a proposed waste disposal solution will really work as described. This doubt is then allied to reluctance to accept or approve the consequences in the event of failure.¹² There may also be the view that the solution proposed, even if it works as intended, is in some fundamental way inadequate, undesirable or inappropriate.¹³

I believe that both of these aspects are present in the nuclear waste debates, however I will focus on the second that, in my view, casts some useful light on the first.

Radioactive wastes are, some of them at least, highly dangerous and very long lived. Since the waste management problem is a long-term thing, confidence is partly a matter of expressing *trust*.¹⁴ In this regard, concerning radioactive wastes we can observe:

- Many people *are not willing to trust the waste to stay put* (for thousands and thousands of years).
- Many people *are not willing to trust the experts* when they say that, suitably contained, the wastes will stay put.

This *mistrust* of both nature (the material wastes) and human nature (the possible failings of the experts) has contributed to the push to introduce the concept of *reversibility* (including retrievability), into the formulation and evaluation of waste management options.¹⁵ In short, the

11. This is a *social fact*, irrespective of the views that might be put forward about the power and authority, in any given society, for deciding and implementing a waste management strategy.

12. This is one part of views people may express about “unacceptable risks”, and where personal ethical considerations and cultural norms can play a significant part.

13. For example, if a person has an infected leg, cutting off the leg is one solution and it may work as planned. But an injection of antibiotics may permit the person to keep living with the leg. It is obvious that, in such a situation, it may not be desirable (from the patient's point of view) to give monopoly decision power to experts in amputation. For 50 years in the nuclear sector, the principal decisions have been taken authoritatively, and the assurance of “quality” has been the designated – or self-designated – responsibility of a limited circle of expertise. The sector, military and civil, has therefore been characterised by what some call a “deficit of dialogue” or even a “deficit of democracy”. This in itself is enough to contribute to suspicions (as to e.g., cover-ups, vested interests, inadequate weight to citizens' concerns, blind spots, group-think, failure to listen to “weak” signals about system weaknesses and risks, etc., etc.). Some parts of public mistrust can be overcome by procedural reforms, scrupulous science and better communication. But, as the infected leg image is intended to make clear, these may not be enough on their own.

14. In this Workshop, one definition offered of trust was (something like) the willingness to be, or become vulnerable, in order to have the possibility to benefit from some outcome that is not achievable otherwise. This definition highlights the importance of identifying what is the “benefit” that is being proposed or sought. The production of radioactive wastes in large quantities is now a historical fact, and what society seeks is to formulate a satisfactory way of living with the wastes.

15. In my view, and for the reasons I evoke here, this *mistrust* that an unobserved waste might not “stay put” is probably more significant in the emergence of “reversibility” than the economic/technical consideration of

interested public are not willing, at the present time, to go along with the model “*out of public sight, out of the public’s mind*”. The enduring presence of the hazardous wastes is bothersome, but it is not easily forgotten. So, a solution that the public will feel able to *trust*, must engage a permanent process of “*watching over the wastes*”.

In short, I am tempted to suggest that the cry for ensuring “reversibility”/retrievability of radioactive wastes has got to do with an intuitive (but in some quarters reluctant) acknowledgement, that the appropriate “model” is along the lines of a long-term nursing job and not the burial of a Coca-cola can.

Let me elaborate some reasons for this suggestion. In the process of trying to satisfy regulatory requirements, and to put at rest some of the public mistrust, many thousands of millions of dollars have been spent on scientific investigations, technical experiments and a variety of deep and surface storage feasibility studies. Simulation models and quantitative risk assessments project hundreds and thousands of years into the future. The chemical, thermal and physical properties of minute fissures in geological formations are studied with assiduity, in the hope of proving (or disproving) a containment prospect. And so on.

The more the scientific and technical frontiers are pushed back, the more complex (and complicated) the systems science questions become. It has to be wondered whether an object, and a disposal process that engages such an extensive, costly and meticulous scientific attention, that has become the focus of deep societal controversy for more than 50 years, and that is expected to remain the object of permanent surveillance for hundreds or even thousands of years, can be considered to be just a waste?

The nuclear wastes, that most people have never seen, have become folkloric in the deepest sense of the term. The class “nuclear waste” is an *icon*, a *symbol* of the great adventure (and the uncertain destiny) of our technological civilisation. This is a *historical liability* not just for us but also for entire future societies (and not just future generations of our forms of society) that will inherit the requirement for *watching over our wastes*, as a part of the cultural (and not just material) legacy of our times.¹⁶

Suppose the construction of an eventual underground storage site, maybe like Yucca Mountain. If the installation is presented like a rubbish dump, then the communities “hosting” the installation will be able to affirm, not without justification, that they are being “dumped upon”. If it is explained to them that placing the installation in their community is the “best” alternative in terms of the overall balance of costs and benefits to the nation, this will only be adding insult to injury...¹⁷

possible benefits from retrieval at a future date. People are not necessarily willing to trust the experts when they suggest adaptations to the “Modern model” of storage, that a variety of provisions for “reversibility” of the containment (etc.) can be incorporated into a waste management strategy. But they strongly insist – as in the example of Port Hope for low-level wastes and also (I suspect) in the case of public outcry over the UK deep disposal proposal – that the wastes should in some way remain “visible” or “accessible to the society” and that the communities or society in question should maintain an active relationship with the site(s).

16. We could define a sort of “coefficient of irreversibility” which compares the lifetime of the active wastes, with the productive lifetime of the nuclear energy generation process.
17. This seems, indeed, to be one possible source of the visible stand-off between the USA federal authority and Nevada State. The USA situation in this regard can be contrasted with the case of Finland, where a sort of symbolic as well as economic partnership seems to have been negotiated, with a reciprocal affirmation of the status of local and national authorities in the implementation of a disposal strategy.

The point here is, once we put aside as inadequate the old model “out of sight, out of mind”, we have to reconsider from the start the consequences of a solution concept, and of its implementation, for the relationships of people to each other. If people complain about being “dumped upon”, then this is not just a problem of economic opportunity or risk of physical injury (e.g., potential exposure to radioactivity in the case of transport accidents, plant malfunction or hostile attack...), it is also a matter of status, pride, prestige. Suppose that there are jobs attached to the long-term task of watching over the wastes and salaries to be paid. In what terms will the jobs of site warden be advertised? Who will be recruited (job opportunities for the locals?)? What will be the sorts of skills required? The salary scale? More especially, what will be the relation of the radioactivity wardens to the local community, and the perception of their role by the rest of the society?

These are some hints of the *social signification dimensions* of the problem. In order to think about this, I have started to make a short (and so far very incomplete) anthropology of “social models” that might be proposed for “watching over the wastes”. Here are a few of those that I have come across so far:

- Build a mausoleum/shrine/temple/tomb.
- The orphan or the waif: Abandonment of the disposal (burial) site to the ghosts.¹⁸
- Construct the installation as a theme park (cf. Port Hope), and development of a tourist operation exploiting concepts of a technological museum, vicarious risk, etc.
- A nursing home for the long-term care of unruly residents who, by chance, could get confused and get out of hand.

Variations of the shrine/temple concept have been offered by many different commentators for some years. The concept has appeal partly because it evokes the “eternal” character of the guardianship task. One could imagine generation after generation of monks roaming the corridors in a solemn contemplation, each generation handing down, by ceremony and song, a unique competence to the one that follows, maintaining an eternal vigil accompanied perhaps by an existential anguish.¹⁹ The shrine/temple concept could also have appeal because, by the establishment of the new priestly caste, it could offer the prospect of a high status rehabilitation option in the case of long-term structural unemployment of highly trained nuclear engineers.

18. If people mistrust nuclear, if they mistrust the wastes, if they mistrust the authorities (which authorities, in what context), what is it that makes them afraid, that nourishes the mistrust, that makes them uncomfortable? There is a very large literature, both scholarly and popular, on the eternal subject of the haunted house, the haunted burial site, the roaming of souls, spirits and shadows not yet reconciled to cross the boundary between the Living or the Dead... It seems plausible that, in order to explore the concerns expressed in society about “orphan sites” and about the problems of “invisible” hazardous wastes, some careful social science enquiry (along the lines of “funky research” methodology mentioned by another speaker in the Workshop) would provide some important insights.

19. One could imagine the monks and acolytes watching the computer screens for a signal of alarm or a flicker of untoward movement just as, in the 1976 film *Il Deserto dei Tartari* (“The Desert of the Tartars”) by Italian director Valerio Zurlini, the soldiers gazed at the horizon waiting eternally for an eventual invasion by nomad Tartars. (According to one website review, “The characters are full of suppressed emotion and inner turmoil, the surrealistic fort a metaphor of their spiritual imprisonment and the huge expanse of desert a tangible, day by day, year by year reminder of their fears and lost aspirations...”).

The point here is not to chastise the technician caste. Rather it is to highlight how each “model” for watching over (or neglecting) the wastes privileges different aspects of social life, different types of prestige & status, different communities, different relationships.

Take the rather contrasting Rest Home option, which today I favour in some ways (for major high-level radioactive waste sites). This brings a different set of connotations from the theme park and different again from the shrine or from a burial ground. The connotations of the nursing activity evoked include patience, compassion, meticulous care, weariness, maybe even mourning and sadness with the pain of a long condemnation to watch over the aging residents of the rest home who, dreadfully, do not know how to die.²⁰

The place of stakeholder deliberation

Now I can come back to the central theme of my comments, the question of stakeholder deliberation. Recall again the three components of a waste management solution:

1. The Science Dimension – **the development, application and maintenance of scientific knowledge and technical competency to measure and to control the present and eventual exposure of living beings to radioactivity.**
2. The Social Dimension – **the envisaging and invention of the ways that the relevant community (or communities) will relate to and interact with the sites and the wastes.**
3. Political/Economic Partnerships – **permitting to mobilise the relevant knowledge and resources for the implementation of an agreed societal solution to the disposal and watching over of the wastes.**

To avoid jealousy amongst stakeholders and experts, I insist again that all three components are “equally important”.²¹ There is a need for us all. There is certainly a need for science and technical competence concerning a very real material problem (viz., the risks of excessive and inadvertent exposures to a dose). But, without attention to the social dimension for constructing the process of watching over the wastes, the necessary political/economic partnerships cannot be built and the relevant knowledge (which includes human sciences as well as technical sciences) will not be obtained or will not be able to be mobilised.

Stakeholder participation, in various forms, can contribute to all three components. Take first the science/technical dimension. Members of a community living in an area will often have a rich informal knowledge of what has taken place in the past, of the functioning of ecosystems, of sources of risks and hazards. Workers in factories often have intimate understanding of the fragility of machines, and of what has really happened to the wastes, that is of great value for design and maintenance programmes and for the monitoring of contaminated sites. Therefore the “non experts” can sometimes “read” or “observe” the world in ways that are not available to formal experts coming from outside. Dialogue and stakeholder consultation can, in principle, ally formal and informal

20. The typical profile of night watchmen and rest home nursing staff is not, on the average, the same as would be expected for technicians/engineers. Choosing the “model” also means introducing considerations and consequences for sex roles, gender specificity (or prejudices), perhaps colour of skin, ethnicity, social status and economic class.

21. The term “equally important” has a qualitative rather than quantitative meaning. The three different inputs are each “crucial” (in economics one speaks of essential and complementary inputs).

expertise. And then, stakeholder deliberation can, in a variety of ways, contribute to the identification of concepts and criteria for a socially satisfying solution. This potential relates to the two remaining components – the elaboration of solution concepts or “models” for disposing of and watching over the wastes, and the design of partnership procedures for implementing a chosen solution concept.

The argument of the (rather large) contemporary literature on public deliberation and participation procedures, is that decision quality may be enhanced through integrating scientific, technical and economic expertises within a *permanent communication process* that, for convenience, one can refer to as stakeholder negotiation.²² That is, prospects for socially satisfactory choices may be explored – though this is far from saying that they can be guaranteed! – through bringing stakeholder perspectives into dialogue with each other, in order to search for a possible common ground. In part, this leads to an emphasis on distinctive human and social science dimensions of communication and deliberative procedures, such as:

- Identification and development of elements of common problem definition and common language for all the parties concerned.
- Understanding of the assumptions underlying expert solution proposals and evaluation techniques, of the terms in which these techniques can contribute to reasoned decisions, and limitations to their application.
- Sharing of the reasons and justifications brought by the different social groups to the deliberation process.
- Status and respect given to participation by both professionals and lay people in the deliberative processes.

Societal deliberation can engage a search for novel and compromise solutions, based on respect (or at least recognition) of divergent criteria and based on the acceptance of a legitimate diversity of preoccupations and perspectives. As already stated, knowledge-sharing based on successful communication refers to recognising and appreciating the different types of knowledge and diversity of motivations that different agents can bring into a dialogue. A person confronted with a question of possible environmental change and future economic effects, or a community exposed to a particular contamination problem – such as a risk to health or to quality and quantity of water supply – is not a passive blob waiting to be “informed” and told what to do by the experts or policy maker. Indeed, on the contrary, it is often the ordinary people who, in order to get on with their lives, push for action and responsiveness by experts and public authorities. This is real “participation”; it is not always possible to wait for the official “consultation”.²³

Structuring multi-stakeholder deliberation

It is clear, from all that I have said, that I do not consider any individual (however expert or humanly wise) as holding out today a completely satisfactory blueprint for “what should be done” for long term radioactive waste management. Yet, there are steps that can undoubtedly be taken to obtain

22. Language choices are never neutral. Whether or not “stakeholder” is an adequate term for all situations of conflict, negotiation and political argumentation is certainly open to debate, but not a question I will explicitly explore here.

23. Initiatives taken by local people in the Serpent River and Pinawa situations as presented during the Workshop, where the communities concerned as well as the wastes have to some extent become “orphan”, are illustrations of political participation in this strong sense.

a better knowledge of the social dimensions of the problem and, hence, what might be some of the necessary preconditions for a societal solution.

Another speaker just before me in this closing session of the Workshop has introduced the concept of “*ethical assessment*”. This is convenient for me, because I want to suggest the importance of carrying out a sort of multi-stakeholder ethical assessment.²⁴

An “ethical assessment” is not a personal moral judgement. Usually, an “ethics” question is seen to arise when there is an *absence of consensus* about criteria of choice or action. When there is not consensus, it is easy (too easy, perhaps) to say that those who are not behaving in ways that I consider acceptable to me are being “not ethical”. But, in a philosophical or social science point of view, assessment means exploring and documenting the preoccupations and principles (the “bottom lines”) of the people making up the affected communities.

To conclude, I want to present, in a stylised way, a conceivable framework for exploring and evaluating the *social as well as technical dimensions* of alternative waste management strategies. Consider the following schema for an evaluation process:²⁵

1. The exploration of options: Radioactive waste policy or management perspectives are explored in terms of a small number of scenarios each of which expresses distinct technological, economic and governance features.
2. The diversity of stakeholders: The scenarios of distinct possible futures are to be evaluated explicitly from distinct stakeholder perspectives.
3. Multiple evaluation criteria: The stakeholders will make evaluations of each scenario in terms of a range of key governance issues, using a variety of different criteria reflecting the full diversity of societal concerns.

The general idea is that a (relatively small) number of waste management strategies, presented as “scenarios”, are identified to be assessed in a *comparative way* by people bringing a variety of preoccupations, expertises and points of view. For example, we could focus on a range of different social models for watching over the wastes, such as the rubbish dump, temple/shrine, haunted burial site, nursing home, etc., as mentioned above.

Then, we can consider each of these solution concepts as *ethically principled actions*, meaning to identify the ways in which, as individual and collective actions, they satisfy or respond to particular criteria of good or sound practice that are suggested by members of the community. In the radioactive waste management situation, examples of possible “ethical bottom lines” could include:

- National autonomy/responsibility (“take care of your own wastes” at national scale).
- That “the polluter pays” (but, how much, to whom, etc.).

24. Once again, I am conscious that the term “stakeholder” is contentious; let me say simply that we are all, in various ways, hosts and guests of each other; and we all have some “stakes” in finding ways of getting along, or not along, together. First peoples, rich people, poor peoples, contaminated site people.

25. This is a highly generic schema. An example of its application, known as “The Deliberation Matrix”, is the multi-media interactive “Deliberation Support Tool” (DST) implemented by researchers in the *GOUVERNe* Project (“Guidelines for the Organisation, Use and Validation of information systems for Evaluating aquifer Resources and Needs”) funded by the European Commission and led by the C3ED research institute (see site <http://www.c3ed.uvsq.fr>).

- A principle of inter-generational responsibility (don't pass on problems to others that you cannot cope with yourself).
- Health security to workers and the public (reasonable steps to avoid an excessive dose).
- Enhance the prestige of the host communities for any waste site; and so on.

By definition, each distinct interest group or stakeholder category will bring a different balance of preoccupations to the deliberation process. I will not attempt to make a list of the plausible categories of stakeholders; this depends to a great extent on the specific situation being addressed.²⁶

It is presumed that a comparative evaluation of the scenarios will take place from a variety of *different points of view* corresponding to distinct stakeholder preoccupations. Each stakeholder group will express different criteria of “adequacy” or “quality” in relation to each of the “governance issues”. Tensions, conflicts of interests, uncertainties and dissent (amongst scientists as well as decision makers, administrators and stakeholders from different walks of commercial activity and civil society) can be explored by comparison of the judgements made about the good and less good features of each solution concept or implementation strategy. In effect, the scenario set becomes the platform for a *multi-stakeholder deliberation* about the *social meanings* as well as the *scientific/technical quality* of the different decision options and policy choices.

It is important to note that this schema for a deliberation process is, in itself, a political model, with underlying philosophy and value judgements. Note as well that an “ethical assessment”, as a social science exercise, might in some cases be carried out for strategic purposes, in order to design better propaganda and more effective manipulation of public opinion and fears. I do not discount this latter possibility.²⁷ But, evidently, I want to focus here on the role of such analyses, dialogue and reflection not for more effective coercion but in the societal search for a possible common ground.²⁸

Stakeholder deliberation does not just permit a structured and transparent evaluation of options by different sectors of the affected communities, it also can permit – through the contact of persons with each other, the learning that takes place – the evolution of perceptions, beliefs, relationships and attitudes. So it is not just a “discussion” of how the society might chart a course for the future, it is actually a contribution to building this future together.

Deliberation often starts with an experience of conflict and impasse. The search for novel and compromise solutions, as possible ways forward together, depends not so much on technical expertise (although this can certainly be helpful, e.g., repairing a car, working out how to contain the reactor wastes) but more especially on *mobilising human know-how and resources* in a social process. In the case of long-term future considerations, even if there is a consensus about the plausibility of *the*

26. Nor do I go into the problem of “representation” in any real deliberation process (meaning, in what sense the persons participating in a process are taken to speak for the interests and concerns of others); nor do I discuss the evident problem of design of a deliberative process, of asymmetries in influence and communication capacities, and so on. All these considerations can, in principle, be explored reflexively *within* a deliberation process (which does not mean they will be resolved to the full satisfaction of all concerned.).

27. Just as technologies in a given sector have their distinctive risks, so social science methodologies open up their distinctive domains of risk.

28. I have developed the distinction between a “domination” and a “coexistence” ethic in e.g., O'Connor M., 1999, Dialogue and Debate in a Post-Normal Practice of Science: A Reflexion, *Futures* 31, pp.671-687.

experts' scenarios indicating severity of a future problem (waste containment, geological stability, etc.), the willingness and ability of people to act for a *common future* depends a lot on the framing of strategies in terms that are meaningful for themselves in their social scene, and that are in conformity with the realities of past experience and practicable future initiatives. Measures for waste management may be technically sound but unacceptable because they are incongruent with social considerations of dignity, honour, status or prestige.

Success in the whole waste watching project – which might be considered as a voyage-in-common – depends somehow on good will, respect and trust; these are the *conditio sine qua non* for any effective and successful partnership among voyagers-in-community. But *trust*, here, is rather more than just confidence that a person will pay their bills or do their job. It relates to a type of mutual respect, even (or especially) amongst enemies. Respect for divergent criteria does not mean the dissolving of all differences and conflicts. It means self-conscious willingness to accept limits, to accept vulnerability, and to make compromises based on the hope of benefits coming from a coexistence.²⁹ Whether or not, in the face of myriad fears, we can develop and maintain this willingness, remains to be seen.

29. “Respectful coexistence” is a delicate point in the current climate of geopolitical tensions about Right and Wrong. The voyage-in-common metaphor used here is partly inspired by the ULYSSES project on public participation in climate change policy formulation and evaluation (Guimarães Pereira A., O’Connor M., 1999, Information and Communication Technology and the Popular Appropriation of Sustainability Problems, *International Journal of Sustainable Development*, 2(3), pp.411-424). For a synthetic discussion on the roles that can be envisaged, in a European context, for stakeholder participation around nuclear energy and wastes, see O’Connor, M. & van den Hove, S., 2001, Prospects for Concertation on Nuclear Risks and Technological Options: Innovations in Governance Practices for Sustainable Development in the European Union, *Journal of Hazardous Materials*, 86, pp.77-99.

LIST OF PARTICIPANTS

BELGIUM

BERGMANS, Anne
Department of Social and Political Sciences
University of Antwerp

HOOFT, Evelyn
ONDRAF/NIRAS
Press Officer

VAN HOVE, Eric
Departement of Social and Political Sciences
University of Antwerp

CANADA

AUSTIN, Rick
Mayor
Port Hope

BAILLIE-MALO, Sharon
Environmental Policy Analyst
Uranium and Radioactive Waste Division
Natural Resources Canada

BLANCHETTE, Marcia
Advisor, Radioactive Wastes
Uranium and Radioactive Waste Division
Natural Resources Canada

BROWN, Peter
Director, Uranium and Radioactive Waste Division
Natural Resources Canada

CLEROUX, Michel
Canadian Nuclear Safety Commission

CYR, Jeff
Program Expert, Aboriginal Consultations
Uranium and Radioactive Waste Division
Natural Resources Canada

FERCH, Richard L.
Director, Wastes and Decommissioning Division
Canadian Nuclear Safety Commission

FLAVELLE, Peter
Senior Specialist, Waste and Geoscience Division
Canadian Nuclear Safety Commission

FLYNN, Brendan
Program Coordinator
Property Value Protection Program
Atomic Energy of Canada Limited (AECL)

HEIGHINGTON, Paul
Director, National Projects
Metis National Council

HOLTON, Blake
Holton Flowers

IGNACE, Lawrence
Environment Policy Analyst
Assembly of First Nations

KRAEMER, Larry	Canadian Association of Nuclear Host Communities Mayor – Municipality of Kincardine
LARCOMBE, Patt	Senior Manager Centre for Indigenous Environmental Resources Winds and Voices Environmental Services Inc.
LETOURNEAU, Carmel	Senior Policy Advisor Natural Resources Canada
LUPIEN, Mario	Chargé d'équipe Étude et règlementation en radioprotection Hydro-Québec, Centrale Nucléaire Gentilly
MACDONALD, Georgena	Representing the Township of the North Shore & The Standing Environmental Committee of the Serpent River Watershed
MCCAULEY, Dave	Senior Policy Advisor Uranium and Radioactive Waste Division Natural Resources Canada
MCFARLANE, Donna	Director, Public Affairs Ontario Power Generation
MCLAUGHLIN, Susan	Financial Advisor Uranium and Radioactive Waste Division Natural Resources Canada
METCALFE, Doug	Head, Geoscience and Waste Assessment, Wastes and Decommissioning Division Canadian Nuclear Safety Commission (CNSC)
MOREAU, Antoine	Consultant Hydro-Québec
OATES, Lawson	Waste Management Services City of Toronto
O'HARA, Kathryn	Associate Professor of Journalism School of Journalism, Carleton University
ORR, Kevin	Communications Specialist, Public Affairs Ontario Power Generation
PAWLOWSKI, Donna	Manager Strategic Planning and External Relations Ontario Power Generation
RHEAUME, Michel	Hydro-Québec
RICHARDS, Alun	Cogema Resources Inc.
ROACH, Donna	Community Relations Manager Communications Division Atomic Energy of Canada Limited (AECL)

SEABORN, Blair	Chairman of the former Canadian Environmental Assessment Panel on Nuclear Fuel Waste Management and Disposal Concept
SENECAL, Pierre	Conseiller Environnement Hydro-Québec
SIMARD, Martin	Programme de géographie et aménagement Université du Québec à Chicoutimi
SIMPSON, Len	Mayor, Town of Pinawa
STOREY, Keith	Social Impact Assessment Expert Department of Geography Memorial University of Newfoundland
TRÉPANIÉ, Marcelle	Conseillère Communications et Collectivités Région Mauricie Hydro-Québec
WLODARCZYK, Tomasz	Senior Consultant and Principal Gartner Lee Limited
ZELMER, Robert	Director, Low-Level Radioactive Waste Management Office Atomic Energy of Canada Limited (AECL)
FINLAND	
SEPPÄLÄ, Timo	Communications Manager Posiva Oy
FRANCE	
BARD, Denis	Laboratoire d'Étude et de Recherche en Environnement et Santé École Nationale de la Santé Publique
LE BARS, Yves	Président, ANDRA
MERCERON, Thierry	ANDRA
O'CONNOR, Martin	Centre d'Économie et d'Éthique pour l'Environnement et le Développement (C3ED) Université de Versailles Saint-Quentin-en-Yvelines
GERMANY	
APPEL, Detlef	Arbeitskreis Auswahlverfahren Endlagerstandorte c/o PanGeo-Geowissenschaftliches Büro
HUNGARY	
ORMAI, Peter	PURAM
ITALY	
RISOLUTI, Piero	Manager, Radioactive Waste Disposal ENEA Casaccia

JAPAN

INAGAKI, Yusuke

Radioactive Waste Management Funding and Geological Disposal Information Technology

TAKEUCHI, Mitsuo

Group Manager, Safety Affairs
Science and Technology Division, Nuclear Waste Management Organisation of Japan (NUMO)

SPAIN

LANG-LENTON, Jorge

Director de Comunicacion
Empresa Nacional de Residuos Radiactivos (ENRESA)

RUIZ LOPEZ, Carmen

Chef du Service de Déchets de Haute Activité
Consejo de Seguridad Nuclear (CSN)

SWEDEN

ENGSTRÖM, Saida

Swedish Nuclear Fuel and Waste Management Co. (SKB)

HEDBERG, Bjorn

Programme Coordinator, Repositories and Siting
Department of Waste Management and Environmental Protection
Swedish Radiation Protection Institute (SSI)

WESTERLIND, Magnus

Director, Office of Nuclear Waste Safety
Swedish Nuclear Power Inspectorate (SKI)

SWITZERLAND

AEBERSOLD, Michael

Federal Office of Energy (BfE)

FRITSCHI, Markus

Repository Projects
NAGRA

UNITED KINGDOM

ATHERTON, Elizabeth

UK Nirex Ltd

CHANDLER, Steve

The Environment Agency

GRAY, Elizabeth

Scottish Executive, Environment and Rural Affairs
Department Environment Protection

HETHERINGTON, John

Environmental Planning Manager
Community, Economy and Environment Department
County Offices

UNITED STATES OF AMERICA

FLEMING, Patricia

Senior Associate Dean, College of Arts and Sciences
Creighton University

JACKSON, Renee

Office of Civilian Radioactive Waste Management
US Department of Energy

KOTRA, Janet P. HLW Public Outreach Team, Division of Waste Management
U.S. Nuclear Regulatory Commission

LEVICH, Robert A. International Program Manager
USDOE/YMP

INTERNATIONAL ORGANISATIONS

BRAGG, Ken Waste Safety Section
IAEA (Vienna)

WEBSTER, Simon Administrator, DG-Energy and Transport
European Commission (Brussels)

OECD/NEA SECRETARIAT

KESSLER, Carol Deputy Director-General
OECD Nuclear Energy Agency (Paris)

PESCATORE, Claudio Principal Administrator, RWM
Radiation Protection and Radioactive Waste
Management Division
OECD Nuclear Energy Agency (Paris)

MAYS, Claire Institut SYMLOG (Paris)

OECD PUBLICATION, 2, rue André-Pascal, 75775 PARIS CEDEX 16
PRINTED IN FRANCE
(66 2003 21 1 P) ISBN 92-64-10396-1 – No. 53255 2003