Learning More Together

Annual Report 2012

nwmo

NUCLEAR WASTE MANAGEMENT ORGANIZATION

SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

Nuclear Waste
Management Organization

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Learning More Together

Annual Report 2012

In 2002, the Government of Canada passed the *Nuclear Fuel Waste Act*, resulting in the creation of the Nuclear Waste Management Organization (NWMO) to develop and implement a plan for the long-term care of the nation's used nuclear fuel. The plan the NWMO is now implementing, Adaptive Phased Management, grew out of a Canada-wide dialogue conducted between 2002 and 2005, and reflects the values and priorities of the thousands of specialists, Aboriginal peoples, and other concerned and interested citizens and organizations that participated in the study process. The plan's end point, a deep geological repository where used nuclear fuel will be safely and securely contained and isolated, is one that most nuclear countries are now pursuing.

In 2010, the NWMO began the process to identify an informed and willing host for Canada's own repository, and opened it to all interested communities. Communities in Saskatchewan and Ontario have expressed an interest in learning more about the project. It is these communities and surrounding areas the NWMO is now working with to find a potential site.

NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

The Honourable Joe Oliver
Minister, Natural Resources Canada
Ottawa, Ontario K1A 0A6

March 2013

Dear Minister,

We are pleased to submit to you the annual report of the Nuclear Waste Management Organization (NWMO) for fiscal year 2012.

We submit this report in compliance with sections 16(1) and 23(1) of the *Nuclear Fuel Waste Act*.

In fulfillment of our obligations under section 24 of the *Act*, we are also making this report available to the public.

Respectfully submitted,

Gary Kugler
Chairman

Ken Nash
President and CEO

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Corporate Overview

NWMO Mandate

The Nuclear Waste Management Organization (NWMO) was established in 2002 by Canada's nuclear electricity producers in accordance with the *Nuclear Fuel Waste Act* (*NFWA*). Operating on a not-for-profit basis under Part II of the *Canada Corporations Act*, the NWMO is responsible for designing and implementing Canada's plan for the long-term management of used nuclear fuel. Used nuclear fuel is created from the generation of electricity in nuclear power plants.

Ontario Power Generation (OPG), New Brunswick Power Corporation[1] and Hydro-Québec (HQ) are the founding Members of the NWMO, and along with Atomic Energy of Canada Limited (AECL), are required to fund the NWMO's operations. The *NFWA* also required the NWMO to establish an Advisory Council whose independent comments on the organization's work are made public.

The *NFWA* required the NWMO to study approaches for the long-term management of used nuclear fuel and recommend to the Government of Canada a preferred approach. The NWMO initiated this study in 2002, and in 2005, after a three-year dialogue with Canadians from coast to coast, submitted to the Minister of Natural Resources a proposed approach for the long-term management of Canada's used nuclear fuel.

In June 2007, the Government of Canada selected Adaptive Phased Management (APM) as Canada's plan for the long-term management of used nuclear fuel. Technically, APM has as its end point the containment and isolation of used nuclear fuel in a deep geological repository constructed in an appropriate rock formation where the used fuel will be safely and securely contained by engineered barriers and the surrounding geology. The management system involves realistic, manageable phases, each marked by explicit decision points with continuing participation by interested Canadians.

[1] In 2004, through a transfer order, the Government of New Brunswick assigned responsibility for all aspects of the provincially owned nuclear generating assets to a new subsidiary corporation, NB Power Nuclear.

The NWMO is now responsible for implementing APM, subject to all the necessary regulatory approvals. In implementing APM, the organization is committed to proceeding in stages, in an open, transparent and inclusive manner, taking the time that is needed to collaboratively plan and then confirm each step with Canadians before moving forward to the next step.

All Canada's used nuclear fuel is safely stored on an interim basis in licensed facilities at the nuclear reactor sites where it is generated in Ontario, Quebec and New Brunswick, and at AECL's nuclear research facilities in Manitoba and Ontario. Used nuclear fuel remains radioactive for hundreds of thousands of years. Canada's plan, APM, is based on the best available knowledge, including the physical sciences, social science and Aboriginal Traditional Knowledge. It is designed to safely contain and isolate the material from people and the environment essentially indefinitely.

An early milestone in implementing APM was the collaborative design of a process to select a site for Canada's used nuclear fuel repository and Centre of Expertise. That process was finalized in 2010, after extensive input from Canadians, and in May of the same year, the NWMO proceeded to the first step in implementing it by initiating a broad program to provide information, answer questions, and build awareness among Canadians about APM and the siting process itself.

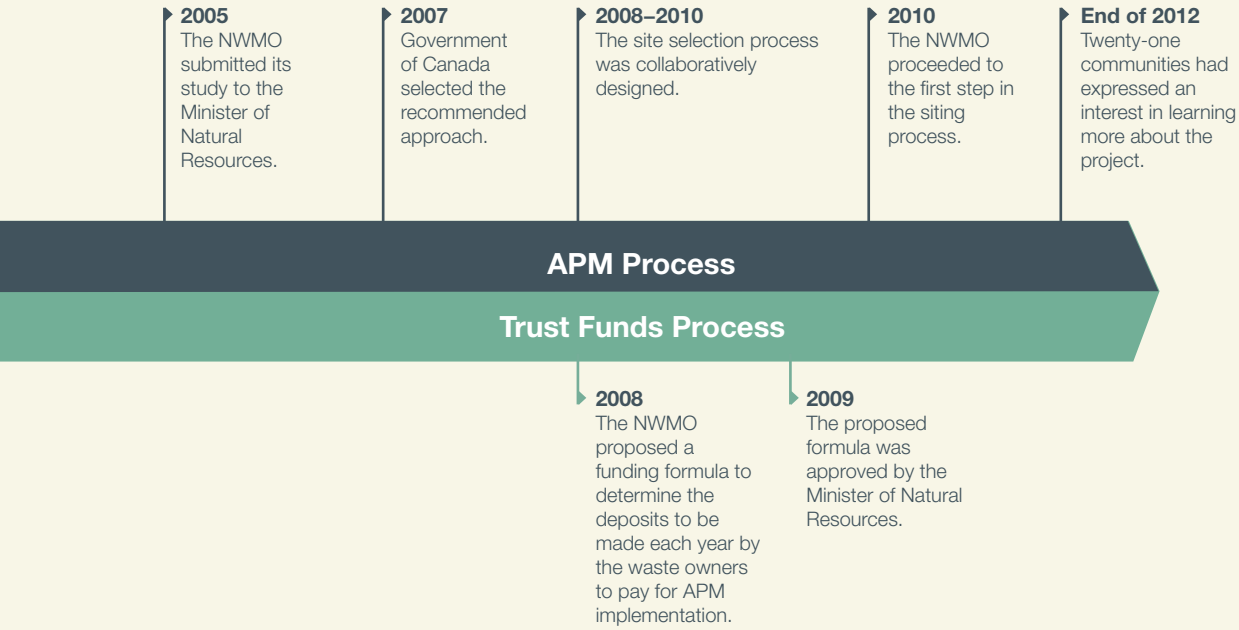
The site selection process is designed to ensure, above all, that the site selected is safe, secure, and located in an informed and willing host community. The process must meet the highest scientific, professional and ethical standards. The safety and appropriateness of any potential site will be evaluated through a series of progressively more detailed scientific, technical and social assessments over a series of steps spanning many years. A robust safety case will need to demonstrate with confidence that the project can be safely implemented at the site and can meet or surpass the requirements of regulatory authorities.

The NWMO initiated a study to propose approaches for the long-term management of Canada's used nuclear fuel.

2002
The NWMO is established

Nuclear fuel waste owners established segregated trust funds to finance the long-term management of their used fuel.

NWMO Milestones



The *NFWA* requires the nuclear fuel waste owners – OPG, HQ, NB Power and AECL – to establish segregated trust funds to finance the long-term management of used fuel. These funds were established in 2002. Contributions are made annually by the waste owners, and audited financial statements are posted on the NWMO website at www.nwmo.ca/trustfunds.

In 2008, as required by the legislation, the NWMO proposed a funding formula to determine the deposits to be made each year by the waste owners to pay for APM implementation. The proposed formula was approved by the Minister of Natural Resources in April 2009. Every year in its annual report, the NWMO specifies the amount each waste owner must deposit for the next fiscal year, along with the rationale by which those respective amounts were calculated.

Used Nuclear Fuel

Canada has been generating electricity from nuclear power for almost 50 years. In that time, 2.3 million used fuel bundles have been produced. Each fuel bundle is about the size and shape of a fireplace log, with a total weight of approximately 24 kilograms.

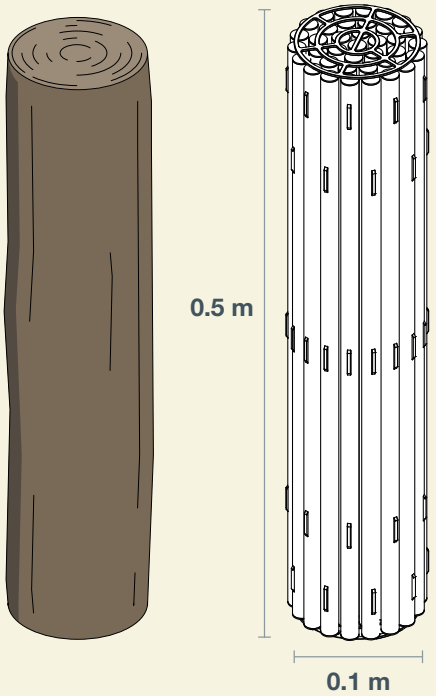
After a fuel bundle is removed from a reactor, it is safely managed in facilities licensed for temporary storage at each reactor site. First, it is placed in a water-filled pool for seven to 10 years while its heat and radioactivity decrease. Afterwards, used fuel bundles are placed in dry storage containers, silos or vaults.

About 85,000 used nuclear fuel bundles are generated in Canada each year. Table 1 summarizes the current inventory of nuclear fuel waste in Canada as of June 30, 2012. The inventory is expressed in terms of number of CANDU used fuel bundles and does not include fuel currently in the reactors, which is not considered “nuclear fuel waste” until it has been discharged from the reactors.

Based on about 20 kilograms of heavy metal in a fuel bundle, 2.3 million bundles is equivalent to 46,000 tonnes of heavy metal (t-HM).

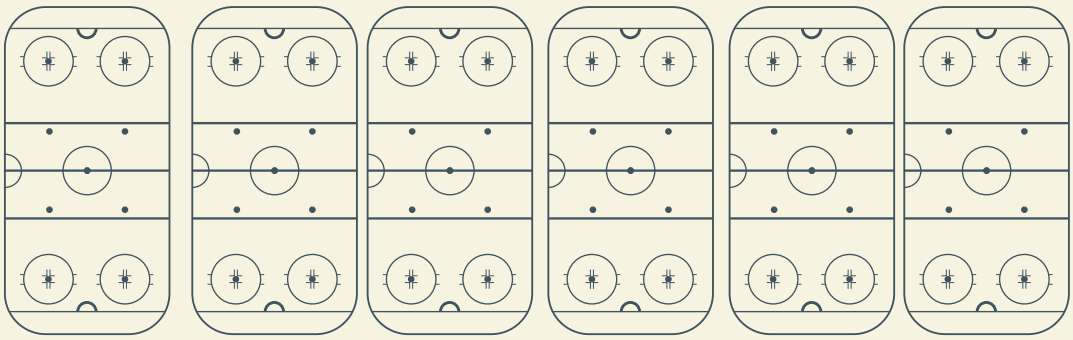
CANDU Fuel Bundle

Each CANDU fuel bundle is about the size and shape of a fireplace log.



>2 million

There are currently just over 2 million used nuclear fuel bundles in Canada. If stacked like cordwood, all this used nuclear fuel could fit into six hockey rinks from the ice surface to the top of the boards. At the end of the planned operation of Canada's existing nuclear reactors, the number of used nuclear fuel bundles will total about 4 million.



Wet Storage

1,532,211

Owner	Location	Number of Bundles
OPG	Bruce A[2]	355,061
	Bruce B[2]	356,318
	Darlington	336,233
	Pickering A & B	406,908
AECL	Douglas Point	0
	Gentilly-1	0
	AECL Whiteshell	0
	AECL Chalk River	0
HQ	Gentilly-2	36,933
NBPN	Point Lepreau	40,758

= 20,000 bundles

AECL Atomic Energy of Canada Limited

HQ Hydro-Québec

NBPN New Brunswick Power Nuclear

NPD Nuclear Power Demonstration

OPG Ontario Power Generation

Dry Storage

815,841

Owner	Location	Number of Bundles
OPG	Bruce A[2]	74,112
	Bruce B[2]	210,806
	Darlington	86,745
	Pickering A & B	243,435
AECL	Douglas Point	22,256
	Gentilly-1	3,213
	AECL Whiteshell	2,268
	AECL Chalk River	4,886
HQ	Gentilly-2	87,120
NBPN	Point Lepreau	81,000

Table 1: Summary of Nuclear Fuel Waste in Canada as of June 30, 2012

Total Bundles			2,348,052
Owner	**Location**	**Number of Bundles**	**Current Status**
OPG	Bruce A[2]	429,173	4 units operational
	Bruce B[2]	567,124	4 units operational
	Darlington	422,978	4 units operational
	Pickering A & B	650,343	A – 2 units operational, 2 units permanently shut down B – 4 units operational
AECL	Douglas Point	22,256	Permanently shut down
	Gentilly-1	3,213	Permanently shut down
	AECL Whiteshell	2,268	Permanently shut down (see note 1)
	AECL Chalk River	4,886	Mostly fuel from NPD (permanently shut down) and with small amounts from other CANDU reactors (see note 3)
HQ	Gentilly-2	124,053	Permanently shut down on December 28, 2012
NBPN	Point Lepreau	121,758	Operational (returned to service in 2012 after refurbishment)

(1) 360 bundles of Whiteshell fuel are standard CANDU bundles. The remaining bundles are various research, prototype and test fuel bundles, similar in size and shape to standard CANDU bundles.
(2) Bruce Power leases the Bruce A and Bruce B reactors from OPG, and OPG is responsible for managing the used fuel produced by these reactors.
(3) In addition to the totals shown in Table 1, AECL also has some 22,000 components of research and development fuels, such as fuel elements, fuel pellets and fuel debris, in storage at Chalk River. While the total mass of these components is small compared to the overall quantity of CANDU fuel, their varied storage form, dimensions, etc. require special consideration for future handling.

Total of:
- 19 units in operation
- 6 units permanently shut down

Vision, Mission and Values

Vision

Our vision is the long-term management of Canada's nuclear waste in a manner that safeguards people and respects the environment, now and in the future.

Mission

The purpose of the NWMO is to develop and implement, collaboratively with Canadians, a management approach for the long-term care of Canada's used nuclear fuel that is socially acceptable, technically sound, environmentally responsible and economically feasible.

Values

Integrity

We will conduct ourselves with openness, honesty and respect for all persons and organizations with whom we deal.

Excellence

We will pursue the best knowledge, understanding and innovative thinking in our analysis, engagement processes and decision-making.

Engagement

We will seek the participation of all communities of interest and be responsive to a diversity of views and perspectives. We will communicate and consult actively, promoting thoughtful reflection and facilitating a constructive dialogue.

Accountability

We will be fully responsible for the wise, prudent and efficient management of resources, and be accountable for all our actions.

Transparency

We will be open and transparent in our process, communications and decision-making, so that the approach is clear to all Canadians.

Chairman's Message

"The NWMO's first 10 years have been both productive and exciting, and the organization's solid achievements in 2012, as in the decade as a whole, have laid the foundation for implementing APM in a way that is safe, secure, and responsive to the values and priorities of the many people who have a stake in it."

Ten years ago, the Government of Canada initiated a comprehensive long-term approach to managing the country's used nuclear fuel by passing the *Nuclear Fuel Waste Act* (*NFWA*). Following passage of the *Act*, the NWMO was created and became responsible for developing and implementing an approach that is socially acceptable, technically sound, environmentally responsible and economically feasible.

A decade later, we have made remarkable progress toward implementing a long-term plan that reflects the values and priorities Canadians have identified over a series of extended national dialogues. In the very early dialogues, conducted between 2002 and 2005, Canadians told us that the generation that has enjoyed the benefits of nuclear power should take responsibility for the waste it produces, that a deep geological repository should be built for the long-term containment and isolation of used nuclear fuel, and that the plan should be implemented in stages, with each doubling as an opportunity for soliciting new input and incorporating new knowledge.

These principles, in turn, were incorporated into Adaptive Phased Management (APM), the approach the NWMO then recommended to the Minister of Natural Resources. In 2007, the Government of Canada selected APM as Canada's plan for the long-term management of used nuclear fuel. Charged with implementing APM, the NWMO once again went back to the Canadian public and asked for its input in developing a process to select a site for a repository.

We are now in the fourth year of implementing the siting process – a process that was built in collaboration with interested Canadians, and that relies on collaboration with interested communities for it to succeed. The large number of communities engaged in learning more about the project – 21 by the end of 2012 – tells us that the approach we are following is succeeding because it continues to reflect the values and priorities of the Canadian public.

The NWMO's activities in 2012 were also guided by its legal obligations under the *NFWA*. The NWMO reviewed the membership of the Advisory Council and added Dr. Wesley Cragg to help address the ethical challenges of working with interested communities and their neighbours. An independent auditor, Deloitte LLP, conducted an audit of the organization's finances.

As in previous years, the NWMO set the amounts waste owners contributed to the trust funds that will be used to finance the long-term management of Canada's used nuclear fuel.

Independent review and advice remained a cornerstone of the NWMO's work. In addition to the expert advice offered by the Advisory Council, the Independent Technical Review Group again conducted its own annual review. As well, an APM Geoscientific Review Group was established to review the preliminary assessments being conducted in communities that have entered Step 3 of the site selection process. The Council of Elders, the successor to the Elders Forum, was another important source of advice to NWMO management, helping it in the vital task of engaging with Aboriginal communities and incorporating Traditional Knowledge in the implementation of APM.

The NWMO also continued its work toward meeting regulatory requirements. APM technical program staff prepared a new safety case study and submitted it to the Canadian Nuclear Safety Commission (CNSC) for regulatory review during the pre-licensing phase of the program. The ongoing work in assessing the safety of a deep geological repository for used fuel will help lay the groundwork for the NWMO to meet the CNSC's regulatory expectations going forward.

The year was also a strong one from an international perspective. The international partnerships that are integral to the work of the APM program helped ensure that the NWMO's work meets the highest standards, while also benefiting the many other countries that are in the process of developing their own repositories. The fourth International Conference on Geological Repositories, which the NWMO hosted in Toronto, served as a forum for exchanging ideas and experiences in developing repositories in ways that meet the expectations of the societies they serve.

The NWMO's first 10 years have been both productive and exciting, and the organization's solid achievements in 2012, as in the decade as a whole, have laid the foundation for implementing APM in a way that is safe, secure, and responsive to the values and priorities of the many people who have a stake in it.

Gary Kugler
Chairman

President's Message

"The organization's solid achievements during 2012 show . . . that it is well on track in collaboratively implementing Canada's plan for the long-term management of used nuclear fuel."

Canada is one of more than a dozen countries with an advanced nuclear power program that have chosen to develop a deep geological repository as the safest and most secure way of managing used nuclear fuel over the long term. Canada's plan, known as Adaptive Phased Management (APM), emerged from an extensive three-year study as the approach that best meets the values and priorities of Canadians.

Safely managing Canada's used nuclear fuel is an issue that concerns a broad spectrum of Canadian society. This makes building sustainable relationships a vital part of the NWMO's work. In 2012, we expanded on those relationships through a wide variety of engagement activities. As in previous years, the Municipal Forum offered expert advice on how best to communicate and work with municipalities, while also acting as a link to municipal associations and their members. The Council of Elders, the successor to the Elders Forum, advised NWMO management on how best to incorporate Aboriginal Traditional Knowledge in implementing APM and to enhance the organization's relationships with Aboriginal communities.

By the end of 2012, three communities in Saskatchewan and 18 in Ontario had decided to enter the site selection process to learn about the APM program. Seventeen of these elected to advance their learning to the preliminary assessment study stage. These studies include a series of community well-being assessments, each designed to develop a profile of the social, economic and cultural factors that need to be taken into consideration when determining the project's potential impact on community life, and technical assessments to see whether the local geology could support a strong safety case for the used nuclear fuel repository.

Safety is the NWMO's primary objective. To this end, we continued to work with Canadian universities and NWMO-equivalent organizations in other countries to ensure that we are incorporating best technical practices in all our work. Of particular interest in 2012 was advanced work on welding techniques and corrosion barriers. A major milestone was achieved by submitting a used fuel repository conceptual design and postclosure safety assessment to the Canadian Nuclear Safety Commission for pre-project review. This review will help ensure that the NWMO's work will meet or exceed regulatory expectations.

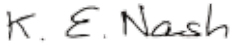
As the site selection process moves forward, transportation will play an increasingly important role. With this in mind, the NWMO continued to exchange information with federal and provincial transportation agencies about long-term plans for the transportation of used fuel. Detailed technical assessments were carried out on potential radiological exposure from used fuel transportation in both normal and accident conditions and posted on the NWMO's website. These assessments show the radiological exposure to be well within regulatory limits and orders of magnitude below exposure from natural background.

In 2012, the NWMO completed certification of its management systems to confirm compliance with recognized standards that provide assurance on quality (ISO 9001), occupational health and safety (CSA Z1000), and environmental management (ISO 14001).

In October, the NWMO had the honour of hosting the fourth International Conference on Geological Repositories. Participants, who included representatives from the Canadian communities involved in the NWMO's site selection process, had the opportunity to learn what different countries and communities are doing to meet societal expectations in their own planning and implementation activities.

As part of a separate contract with Ontario Power Generation (OPG), the NWMO supported the public review process for OPG's application for a licence to build a deep geologic repository for low and intermediate level waste near Kincardine, Ontario. The design work the NWMO is doing for the project advanced to the 50-percent completion mark.

Finally, the NWMO itself reached an important milestone: its 10th anniversary. The organization's solid achievements during 2012 show just how far it has come during that time, and that it is well on track in collaboratively implementing Canada's plan for the long-term management of used nuclear fuel.



Ken Nash
President and CEO


will
Implementing Adaptive Phased Management 2010 to 2017
Safe and Secure Transportation of Canada's Used Nuclear Fuel

Our Work

The NWMO is responsible for implementing Adaptive Phased Management (APM) – Canada's plan for the long-term management of used fuel produced by Canadian nuclear electricity generators. The NWMO is committed to carrying out its work collaboratively with interested and affected citizens and organizations in a manner that is socially acceptable, technically sound, environmentally responsible and economically feasible.

The NWMO's work in 2012 was guided by seven strategic objectives previously identified in collaboration with interested Canadians. It is against these that the organization reports on its activities for the year:

1. **Building Sustainable Relationships**
2. **Collaboratively Implementing the Site Selection Process**
3. **Optimizing Repository Designs and Further Increasing Confidence in Safety**
4. **Providing Financial Surety**
5. **Adapting Plans**
6. **Ensuring Governance and Accountability**
7. **Building and Sustaining a High-Performing Organization**

In addition to implementing APM, the NWMO has services contracts in support of the proposed deep geologic repository for low and intermediate level waste owned by Ontario Power Generation (OPG). These contracts extend through the regulatory approvals phase, and will include the design, construction, and commissioning of the project. This work, which is separate from APM, is profiled in the chapter *Ontario Power Generation's Deep Geologic Repository Project for Low and Intermediate Level Waste*.

The Year 2012 at a Glance

Building Sustainable Relationships

The NWMO continued to engage with the many groups involved in the long-term management of Canada's used nuclear fuel, including Aboriginal organizations, municipal associations, federal and provincial governments, and young Canadians.

Collaboratively Implementing the Site Selection Process

A strong showing of interest in learning more about the project – 21 communities by year's end – allowed the NWMO to suspend new expressions of interest from potential host communities. At the same time, 17 communities entered Step 3 in the nine-step site selection process.

Optimizing Repository Designs and Further Increasing Confidence in Safety

The NWMO's technical program continued research and development in the key areas of repository engineering, geoscience and repository safety.

Providing Financial Surety

The NWMO, in compliance with the *Nuclear Fuel Waste Act*, set the levels of trust fund deposits to be made by Canada's used nuclear fuel owners. Toward this end, the NWMO also produced a new cost estimate for implementing APM.

Adapting Plans

The NWMO engaged in continuous learning so as to be able to adapt its plans should new technologies emerge or societal expectations change. The importance of responding to societal expectations was underscored in an international conference hosted by the NWMO.

Ensuring Governance and Accountability

Multiple layers of oversight and peer review, complemented by externally audited international certifications, helped ensure that the NWMO's work was both transparent and guided by the highest scientific and professional standards.

Building and Sustaining a High-Performing Organization

The NWMO continued to enhance its staffing and contractor capability through a variety of initiatives, including research partnerships with universities, staff training and development, and investment in business systems and processes.

Additional Work

Environment Canada and the Canadian Nuclear Safety Commission established a Joint Review Panel to review the documentation the NWMO helped prepare on behalf of OPG's application to build a facility for the long-term management of low and intermediate level radioactive waste at the Bruce nuclear site. The NWMO's work on the project is described in the chapter *Ontario Power Generation's Deep Geologic Repository Project for Low and Intermediate Level Waste*.

Building Sustainable Relationships

STRATEGIC OBJECTIVE

The NWMO will build sustainable, long-term relationships with interested Canadians and Aboriginal peoples of Canada, and involve them in setting future directions for the safe, long-term management of used nuclear fuel.

Safely managing Canada's used nuclear fuel is an issue that concerns a broad spectrum of Canadian society. The public at large, Aboriginal communities, municipal organizations, ministries and regulatory agencies, elected officials, and the young Canadians who will be affected by decisions made today – all have a stake in making sure that Adaptive Phased Management (APM) is implemented in a way that is safe, fair and responsive to deeply held values. This makes building sustainable relationships a vital part of the work the NWMO does. By keeping all interested and potentially affected individuals and organizations informed about APM and by continuously involving them in its planning and implementation, the NWMO helps ensure the long-term management of Canada's used nuclear fuel is a collaborative endeavour.

Among the steps taken to achieve this goal in 2012 were the inauguration of a Council of Elders; a greater involvement with planners, elected officials and opinion leaders on the vital issue of safely transporting used nuclear fuel; and the launch of new communications initiatives designed to answer questions from interested communities and keep them informed about the project.

Working With Municipal Associations and Representatives

Understanding local perspectives is critical to the design and refinement of plans and processes involved in implementing the site selection process. With this in mind, the NWMO continued to seek advice through ongoing meetings with communities hosting nuclear facilities, as well as with municipal associations in the nuclear fuel cycle provinces. Among the former were the Canadian Association of Nuclear Host Communities and the Durham Nuclear Health Committee, which continued to provide insight and advice on how the NWMO might broaden its awareness-building activities and municipal outreach both in the nuclear provinces and nationally.

The Municipal Forum, which the NWMO established in 2009 with the support of the Federation of Canadian Municipalities (FCM), continued to provide insight on best practices for communicating and working with local governments and associations, while also acting as a link to municipal associations and their members. As in previous years, members helped the NWMO better understand the needs and processes of municipalities involved in the APM site selection process or potentially affected by it. In particular, they provided advice on information and communications materials appropriate to municipalities considering locating a large, national infrastructure project in their communities.

The NWMO booth at the 2012 conference of the Federation of Canadian Municipalities.

The NWMO met with the Forum in March, July and December. Forum representatives also attended the International Conference on Geological Repositories (described in *Adapting Plans*).

The NWMO participated in 18 different conferences hosted by municipal associations, and through this involvement, provided information and updates on the site selection process to municipalities in Saskatchewan, Ontario and New Brunswick. Representatives of communities involved in the site selection process were frequent visitors to the NWMO exhibits, and in many instances, these visitors introduced representatives of neighbouring communities to speak with NWMO personnel and learn more about the project. Representatives from other communities were also frequent visitors to the NWMO's booths.

The NWMO also engaged community leaders in the 21 communities participating in the site selection process. Among these leaders were representatives of municipal councils, community liaison committees (CLCs), local economic development offices, and chambers of commerce. In response to invitations, the NWMO attended and participated in community events, such as home shows, fishing festivals, and an Elders' gathering and trade show.

Funding the NWMO provides through its *Learn More Program*, as detailed online at www.nwmo.ca/invitation_to_learn_more, supported community learning and involvement.

Involving Aboriginal Organizations

Involving Canada's Aboriginal peoples in the design and implementation of APM is a vital part of the NWMO's work. Toward this end, the NWMO maintains relationships with a wide range of national and provincial Aboriginal organizations, and has developed appropriate agreements with each group. These agreements are designed to support broad-level Aboriginal involvement and capacity building at each stage of implementing APM, and each reflects the unique needs, priorities, and cultural and political protocols of the individual Aboriginal organizations.

In 2012, the NWMO continued to meet with national and provincial Aboriginal organizations and keep them informed about the project. It did so through a wide variety of channels, including information sessions, workshops, and meetings with Elders and Chiefs. Several organizations invited NWMO staff to meet them and make presentations. These included Treaty 3 Elders and youth, Treaty 4 Elders in Saskatchewan, the Federation of Saskatchewan Indian Nations, the Prince Albert

Grand Council, and the Union of New Brunswick Indians. As detailed in *Adapting Plans*, the Assembly of First Nations made recommendations to the NWMO in two separate reports, while the Métis Nation of Ontario organized a tour of a nuclear waste facility and a briefing for all Regional Consultation Committees in the vicinity of potential sites. At the same time, the Métis Nation of Ontario initiated a similar program of capacity building.

There were several new agreements designed to promote mutual learning, and as they have in past years, NWMO staff attended Aboriginal trade shows, where they answered questions about APM and encouraged feedback and input from attendees.

The Aboriginal organizations the NWMO works with have also assisted in identifying Aboriginal communities that might be potentially affected by decisions of individual communities to enter Step 3 of the site selection process.

The Council of Elders

The Council of Elders functions as an advisory body to NWMO management, providing counsel on the application of Traditional Knowledge in the implementation of APM. The Council also provides advice on matters that could enhance the development and maintenance of good relations with Aboriginal communities. Through its guidance, the Council works to protect and preserve all creation: air, land, fire, water, plants, medicines, animals and humankind – guided by the seven universal teachings of love, trust, sharing, honesty, humility, respect and wisdom.

The Council of Elders is the successor to the Elders Forum, which held its last meeting at the end of 2011. This step was taken after Forum members identified a need to enhance the work they were doing. As a result, a working group of Elders was formed to work with NWMO staff, the Board of Directors and the Advisory Council. Based on these discussions, dialogue with some Aboriginal organizations, and an examination of best practices, a *Proposal for the Redevelopment of the NWMO Elders Forum* was drafted. The proposal, which was discussed by the Elders Forum when it met in July 2011, featured a draft terms of reference for a new Council of Elders. When the process for selecting the Council of Elders was initiated, there were strong expressions of interest from many Elders from the original Forum, in addition to nominations from Aboriginal organizations.

The Council's inaugural meeting was held in June, and included traditional ceremonies to welcome the new members of the Council of Elders and thank the former members of the Elders Forum. The new members were updated on the NWMO's site selection process, Aboriginal engagement activities and technical studies. The Council discussed the application of Aboriginal Traditional Knowledge to both the NWMO's engagement process and technical studies.

Lawrence Joseph and Billie Schibler participate in the first Council of Elders meeting held at the BMO Financial Group Institute for Learning in November 2012.

The Council of Elders met again in November. Elders visited the Pickering Used Fuel Storage Area to see how used nuclear fuel is safely managed. Staff at the Pickering facility briefed them about the process and standards they apply to their work. The November meeting included updates on the siting process, a presentation on how Aboriginal Traditional Knowledge is being applied in other developments, discussion on legacy issues that the nuclear industry should address, and the involvement of youth with the Council of Elders.

Strengthening Relationships With Federal and Provincial Governments

The NWMO continued to strengthen its relationships with governments, and in so doing, familiarized itself with the processes for managing issues such as transportation, the duty to consult Aboriginal peoples, and access to Crown land. As in previous years, these exchanges fostered greater understanding of the organization's work and allowed for an exchange of information. Since APM touches on the mandates of numerous government departments, the NWMO's practice has been to identify a lead ministry as the primary point of contact. To maximize linkages related to the long-term management of used nuclear fuel, the NWMO continued to encourage coordination of engagement across relevant ministries and across various levels of management in the public service. In addition, NWMO staff continued to keep elected representatives informed about APM and offered briefings to build understanding of the site selection process.

Engaging With Young Canadians

The long planning and implementation horizons associated with APM allow for many opportunities for phased and adaptive decision-making that is responsive to Canadian values and priorities. By the same token, the process is responsive to inter-generational considerations associated with the implementation of the project.

The NWMO has consistently articulated a commitment to intergenerational fairness and inclusiveness. It recognizes that youth have a major stake in APM – locally, regionally, provincially and nationally – and with this in mind, its engagement activities provide numerous opportunities for youth to become engaged and informed. These include:

- Engaging youth in dialogue activities;
- Involving Aboriginal youth in engagement initiatives and forums;
- Providing presentations to post-secondary students in relevant disciplines;
- Presenting engagement opportunities for youth in the communities participating in the site selection process;
- Providing support for students pursuing postgraduate studies in subject areas relevant to the NWMO's work;
- Providing support for the Ryerson University Chair in Indigenous Governance; and
- Promoting youth involvement in science through the various initiatives of the Corporate Social Responsibility Program (CSRP).

Each of these activities continued in 2012. Presentations, in classrooms and at local open houses, were made to more than 700 elementary and high-school students in communities participating in the site selection process. As well, NWMO staff made 15 seminar presentations to university students enrolled in programs relevant to the organization's work. Further details, including an overview of the NWMO's youth engagement activities to date and its priorities moving forward, are available online at www.nwmo.ca/engagingyouth.

Youth and the NWMO's Corporate Social Responsibility Program

Through its CSRP, the NWMO works with organizations to increase youth involvement in science and technology. In 2012, the NWMO supported three organizations whose programs provided opportunities to focus contributions in regions involved in the site selection process. The three were Shad Valley, Youth Science Canada and the Science North School Outreach Program.

Bronze medal finalists, senior category, at the 2012 Canada-Wide Science Fair.

Youth Initiatives Under the Corporate Social Responsibility Program

The NWMO has supported Shad Valley since 2009. Shad Valley is a four-week summer enrichment program for high-achieving secondary school students with strong academic records. Held on different Canadian university campuses, the program focuses on science, engineering, technology, leadership and entrepreneurship. The NWMO supports the program by providing bursaries to students from Ontario, Saskatchewan, New Brunswick and Quebec.

The NWMO has supported Youth Science Canada since 2008. The program encourages Canadian youth to get involved in science by developing scientific and technological knowledge and skills through project-based science. In 2012, the NWMO supported the bronze medalists at the Canada-Wide Science Fair, held in Charlottetown, Prince Edward Island. The Fair brings together finalists from regional science fairs to meet and compete in a national championship round. At the awards ceremony, the NWMO funded and presented 147 bronze medal awards to finalists in the junior, intermediate and senior categories.

In 2012, the NWMO provided funding to the Science North School Outreach Program for communities in Northern Ontario that are involved in the NWMO's site selection process. NWMO funding provides an opportunity for schools to augment their existing science curriculum through hands-on interactive programs. The program is classroom-based.

Communicating With the Public About Adaptive Phased Management and the Site Selection Process

New communications initiatives in 2012 included the release of two brochures (*Description of Canada's Repository for Used Nuclear Fuel and Centre of Expertise* and *Safe and Secure Transportation of Canada's Used Nuclear Fuel*) and the launch of a question-and-answer series called *Ask the NWMO*.

Ask the NWMO is a column that appeared on a biweekly basis in 15 local and regional publications, both in newspapers and online, featuring answers by NWMO specialists to questions posed by people from interested communities.

NWMO staff member, pictured third from the left, briefs reporters during the fourth International Conference on Geological Repositories, held in Toronto, Ontario, between September 30 and October 3, 2012.

The NWMO website was continually updated throughout 2012, and as in previous years, the draft five-year implementation plan (for 2013 to 2017) was posted for public comment (detailed in *Adapting Plans*). Efforts were made to provide access to presentations and other materials used at conferences and seminars for people who were interested but unable to attend, including a complete webcast of the fourth International Conference on Geological Repositories (also detailed in *Adapting Plans*). In each of the communities engaged in the site selection process, the NWMO installed permanent kiosks and document stands. To keep both communities and the general public informed about its latest work, the NWMO published and disseminated a quarterly newsletter.

To support its communications activities, the NWMO opened a *Learn More Centre* in its Toronto headquarters. A fully equipped meeting space, the Centre features exhibits and panels explaining APM and the safeguards and regulations that will be in place at Canada's deep geological repository. The venue is used for meetings and briefings, both for community groups and staff.

The NWMO also hosted three "Learn More" days for media from communities and regions currently engaged in the site selection process, including a briefing in June for media from northern Ontario and another in September for media from Bruce and Huron Counties. As part of the "Learn More" days, reporters toured an interim nuclear waste storage facility. The organization responded to numerous media inquiries from outlets serving communities engaged in the *Learn More* process, and assisted national and international broadcast and print media interested in Canada's plan for long-term used nuclear fuel management.

The NWMO worked with the CLCs established in Step 3 communities to help them develop websites and newsletters to communicate their activities and developments at the local level. (The committees are described in detail in *Collaboratively Implementing the Site Selection Process*.) The committees' respective websites can be accessed at www.clcinfo.ca.

Employee Community Involvement

The NWMO encourages and supports employees' efforts to make a difference in their communities. July marked the fifth year in a row that NWMO employees participated in the Toronto YMCA Corporate Team Challenge to raise money for the YMCA Strong Kids Campaign, an initiative that helps children, teens and young adults live healthier and happier lives. This year's course was Toronto's Honda Indy Racetrack. Making the circuit were 35 employees, divided into five teams of runners and five teams of walkers.

NWMO employees also participated in Pollution Probe's annual Clean Air Commute, making this the third year they have done so. The week-long challenge is a friendly competition among workplaces that encourages commuters to choose more sustainable forms of transportation, whether by biking, walking, taking public transportation, carpooling or telecommuting. More than 50 NWMO employees rose to the challenge, and among them, prevented 2.5 tonnes of pollutants from being released into the air.

In November, NWMO male employees participated in Movember, an initiative that raises funds to fight prostate cancer, build awareness about the disease, and address the mental health issues it raises. This year, 16 participants raised both funds and awareness by growing moustaches for the duration of the month.

NWMO participants at the 2012 Toronto YMCA Relay for Strong Kids.

Collaboratively Implementing the Site Selection Process

STRATEGIC OBJECTIVE

The NWMO will implement collaboratively with Canadians the process for siting a deep geological repository for the safe, long-term management of used nuclear fuel in an informed, willing host community.

The NWMO launched its site selection process in May 2010. The road map it is following, *Moving Forward Together: Process for Selecting a Site for Canada's Deep Geological Repository for Used Nuclear Fuel*, was developed between 2008 and 2009 in collaboration with interested Canadians.

The nine-step siting process resulting from that dialogue is designed to ensure that the site selected is safe and that the community selected to host the project is both informed and willing, and that the project will foster its well-being.

Because the site selection process is community-driven, the initiative to express interest in learning and then proceed in the process must come from the community. The community, moreover, can withdraw at any point up to signing a formal agreement with the NWMO to host a deep geological repository.

Safety is the top priority in selecting a site. At the same time, the project must also be implemented in a way that fosters the well-being of the host community and surrounding area over the long term. Both conditions must be met before a preferred site will be identified. The studies the NWMO conducts collaboratively with communities include examining potential effects of the project on the quality of life in the community and surrounding area, as well as possible social, cultural and economic impacts.

The Site Selection Process: The Year at a Glance

The site selection process reached three milestones in 2012:

1. To focus on working with the large number of communities already engaged in learning more about the process, the NWMO suspended new expressions of interest effective September 30, 2012;

2. Seventeen communities entered Step 3 and requested preliminary assessments of their potential suitability to host the project; and

3. Local community liaison committees (CLCs) were established in eight Step 3 communities.

Because the site selection process is designed to be flexible and because it encourages individual communities to proceed at a pace and in a manner reflecting their needs and preferences, the year's end saw interested communities at different steps in the process, with four in Step 2 and 17 in Step 3.

Communities in Step 2 (as of December 31, 2012)
Learning More/Initial Screenings

Central Huron (ON)
Manitouwadge (ON)
Nipigon (ON)
White River (ON)

Communities in Step 3 (as of December 31, 2012)
Learning More/Preliminary Assessments

Arran-Elderslie (ON)
Blind River (ON)
Brockton (ON)
Creighton (SK)
Ear Falls (ON)
Elliot Lake (ON)
English River First Nation (SK)
Hornepayne (ON)
Huron-Kinloss (ON)
Ignace (ON)
The North Shore (ON)
Pinehouse (SK)
Saugeen Shores (ON)
Schreiber (ON)
South Bruce (ON)
Spanish (ON)
Wawa (ON)

Steps in the Siting Process

Step 1	**The NWMO initiates the siting process with a broad program to provide information, answer questions and build awareness among Canadians about the project and siting process (initiated in May 2010).** Awareness-building activities will continue throughout the full duration of the siting process.
Step 2	**Communities identify their interest in learning more, and the NWMO provides detailed briefing. An initial screening is conducted.** At the request of the community, the NWMO will evaluate the potential suitability of the community against a list of initial screening criteria.
Step 3	**For interested communities that successfully complete an initial screening, a preliminary assessment of potential suitability is conducted.** At the request of the community, the NWMO will conduct a feasibility study collaboratively with the community to determine whether a site has the potential to meet the detailed requirements for the project. Interested communities will be encouraged to inform surrounding communities, including potentially affected Aboriginal communities and governments, as early as possible to facilitate their involvement.
Step 4	**Potentially affected surrounding communities are engaged if they have not been already, and detailed site evaluations are completed.** In this step, the NWMO will select one or more suitable sites from communities expressing formal interest for regional study and/or detailed multi-year site evaluations. The NWMO will work collaboratively with these communities to engage potentially affected surrounding communities, Aboriginal governments and the provincial government in a study of health, safety, environment, social, economic and cultural effects of the project at a broader regional level (Regional Study), including effects that may be associated with transportation. Involvement will continue throughout the siting process as decisions are made about how the project will be implemented.
Step 5	**Communities with confirmed suitable sites decide whether they are willing to accept the project and propose the terms and conditions on which they would have the project proceed.**
Step 6	**The NWMO and the community with the preferred site enter into a formal agreement to host the project. The NWMO selects the preferred site, and an agreement is ratified.**
Step 7	**Regulatory authorities review the safety of the project through an independent, formal and public process, and if all requirements are satisfied, give their approvals to proceed.** The implementation of the deep geological repository will be regulated under the *Nuclear Safety and Control Act* and its associated regulations to protect the health, safety and security of Canadians and the environment, and to respect Canada's international commitments on the peaceful use of nuclear energy. Regulatory requirements will be observed throughout all steps in the siting process. The documentation produced through previous steps, as well as other documentation that will be required, will be formally reviewed by regulatory authorities at this step through an Environmental Assessment and then licensing hearings related to site preparation and construction of facilities associated with the project. Various aspects of transportation of used nuclear fuel will also need to be approved by regulatory authorities.
Step 8	**Construction and operation of an underground demonstration facility.** The NWMO will develop the centre of expertise, launched in Step 4, to include and support the construction and operation of an underground demonstration facility designed to confirm the characteristics of the site before applying to regulatory authorities for an operating licence. Designed in collaboration with the community, it will become a hub for knowledge sharing across Canada and internationally.
Step 9	**Construction and operation of the deep geological repository and associated facilities.** The NWMO begins construction of the deep geological repository and associated surface facilities. Operation will begin after an operating licence is obtained from regulatory authorities. The NWMO will continue to work in partnership with the host community in order to ensure the commitments to the community are addressed throughout the entire lifetime of the project.

Step 1

The NWMO initiates the siting process with a broad program to provide information, answer questions and build awareness among Canadians about the project and siting process (initiated in May 2010). Awareness-building activities will continue throughout the full duration of the siting process.

Building Awareness

As described in the previous chapter, the NWMO engages in a wide variety of outreach activities designed to increase public awareness of Canada's plan for the long-term management of used nuclear fuel. These activities include briefings to public officials, talks at universities, and presentations and information booths at municipal conferences and other events. Step 1 activities are meant to continue through each of the nine steps of the site selection process. Up until the suspension of new expressions of interest on September 30, 2012, the Step 1 activities conducted by the NWMO included site visits and briefings for any communities expressing an interest in the process and considering engaging further.

From the news release announcing the suspension of new expressions of interest

"...The NWMO is planning to suspend the expressions of interest phase of the site selection process on September 30, 2012. New expressions of interest will not be considered after this date. This will allow the NWMO to focus its efforts on conducting the detailed studies required in communities that have expressed an interest to date, or that express interest on or before the closing date. It will also help the NWMO plan for and fully support the engagement of surrounding communities and potentially affected Aboriginal peoples, which is initiated with the entrance of a new community to the siting process. Expressions of interest by new communities must be supported by a resolution of Council, or equivalent, and may take the following forms: request for an NWMO briefing to learn about the project and the site selection process; or request for an initial screening of the potential suitability of the community for the project..."

Step 2

Communities identify their interest in learning more, and the NWMO provides detailed briefing. An initial screening is conducted. At the request of the community, the NWMO will evaluate the potential suitability of the community against a list of initial screening criteria.

Learning More and Initial Screenings

Step 2 begins with a community request for an initial screening to see if there are any obvious technical conditions that would exclude the community from further consideration. At the same time, and at the request of the community, the NWMO supports a variety of activities designed to increase community understanding of Adaptive Phased Management (APM) and the NWMO's role in implementing it. These can include a tour of an interim waste storage facility; meetings with the Canadian Nuclear Safety Commission (CNSC) to better understand the regulatory framework; open houses where residents can learn more about the project, the NWMO, the site selection process, and the results of the initial screening conducted by the NWMO; and communications initiatives, such as advertising in local newspapers and setting up permanent kiosks and document stands. There is also funding for visioning exercises designed to help the community reflect on whether the project would be in its interest.

In the communities that were progressing through Step 2 in 2012, the NWMO's activities focused on delivering results from initial screenings to local councils through presentations at their meetings and to communities through a variety of channels. The latter included open houses and outreach to community groups, such as schools, service organizations, first responders, business leaders, and others as requested by the communities.

Engaging Aboriginal Communities

When a community enters Step 2, the NWMO also sends letters to nearby Aboriginal communities, informing them of the interest of the candidate community and offering to provide additional information, as well as an update on the site selection process. The NWMO works with mayors and local councils to help them engage nearby Aboriginal communities in the learning process.

Step 3

For interested communities that successfully complete an initial screening, a preliminary assessment of potential suitability is conducted. At the request of the community, the NWMO will conduct a feasibility study collaboratively with the community to determine whether a site has the potential to meet the detailed requirements for the project. Interested communities will be encouraged to inform surrounding communities, including potentially affected Aboriginal communities and governments, as early as possible to facilitate their involvement.

Continuing the Learning: Preliminary Assessments

Step 3 is an opportunity for communities to continue learning more about the project. At the request of communities that successfully complete Step 2, the NWMO conducts preliminary assessments in collaboration with the community to determine whether a site has the potential to meet the detailed requirements for the project. The assessments provide an opportunity for both the community and the NWMO to explore four key questions (see facing page) that will be important in assessing the suitability of the community to host the project. Councils of communities that have entered Step 3 can apply to the NWMO for funding to support their continued participation in the process.

Assessments conducted during Step 3 occur in two consecutive phases. Phase 1 studies are mostly technical studies and engagement activities focused on learning about the community and potential sites. Phase 2 studies, for communities that continue in the process, will involve some limited fieldwork and expanded engagement with the community and surrounding region. In both phases, studies are undertaken only after local accountable authorities have passed a council resolution expressing interest in participating in this step, and have entered into an agreement with the NWMO, detailing the nature of the work, the engagement activities that will complement it, and the resources the NWMO will provide to help carry out these commitments.

The NWMO works in partnership with communities to learn about and explore the project, and this work is supported by a range of contractors working in a number of specialty areas. At the end of each phase, there is an opportunity for the community and the NWMO to take stock of the results and decide whether to proceed.

Key Question	Approach	Considerations
Safety, security and protection of people and the environment are central to the siting process. **Is there the potential to find a safe site?**	This question will be explored through further work to examine the suitability of the geology in the area and to identify specific potentially suitable siting areas.	The existence of potentially suitable siting areas must be demonstrated through technical studies conducted by consultants who are experts in the field hired by the NWMO. » One or more potentially suitable siting areas must be acceptable to the community, as represented by accountable authorities, as the focus of any future work.
The project will be implemented in a way that will foster the long-term well-being of the community. **Is there the potential to foster the well-being of the community through the implementation of the project, and what might need to be put in place (e.g. infrastructure, resources, planning initiatives) to ensure this outcome?**	This question will be explored through further work to understand the community's vision for its long-term sustainability and well-being, the current conditions in the community, and opportunities for the community to benefit from the project. Any social and economic pressures that will need to be carefully managed will also be identified.	» The potential to foster the well-being of the community must be shown to the satisfaction of the community, as represented by accountable authorities, and the NWMO. » The investment required to ensure this outcome must be reasonable as determined by the NWMO.
At a later step in the process, the community must demonstrate it is informed and willing to host the project. **Is there the potential for citizens in the community to continue to be interested in exploring this project through subsequent steps in the site selection process?**	This question will be explored together with the accountable authorities in the community through organizing open houses, community meetings and conversations with people in the community.	» The potential for sustained interest among citizens in the community must be shown to the satisfaction of the community, as represented by accountable authorities, and the NWMO.
The project will be implemented in a way that will foster the long-term well-being of the surrounding area. **Is there the potential to foster the well-being of the surrounding area and to establish the foundation to move forward with the project?**	This question will be explored together with the accountable authorities in the community through one-on-one meetings with accountable authorities, opinion leaders and Aboriginal communities in the area, as well as through workshops.	» The potential for sustained interest in the project in the surrounding area must be shown to the satisfaction of the community, as represented by accountable authorities, and the NWMO.

Step 3

Phase 1 Technical Studies

Phase 1 technical studies are a preliminary exploration of the potential suitability of the local geology to contain and isolate used nuclear fuel. They have safety, for people and the environment, as their overriding goal, and with this in mind, the questions they explore include:

- Are the characteristics of the rock at the site appropriate to ensuring the long-term containment and isolation of used nuclear fuel from people, the environment and surface disturbances caused by human activities and natural events?
- Is the rock formation geologically stable and likely to remain stable over the very long term in a manner that will ensure the repository will not be substantially affected by geological and climate change processes such as earthquakes and glacial cycles?
- Are conditions suitable for the safe construction, operation and closure of the repository?
- Is future human intrusion (e.g., exploration or mining) unlikely?
- Can the geologic conditions be practically studied and described at a scale that supports demonstration of long-term safety?
- Can a transportation route be identified or developed for the safe and secure transportation of used nuclear fuel from the locations where it is currently stored?

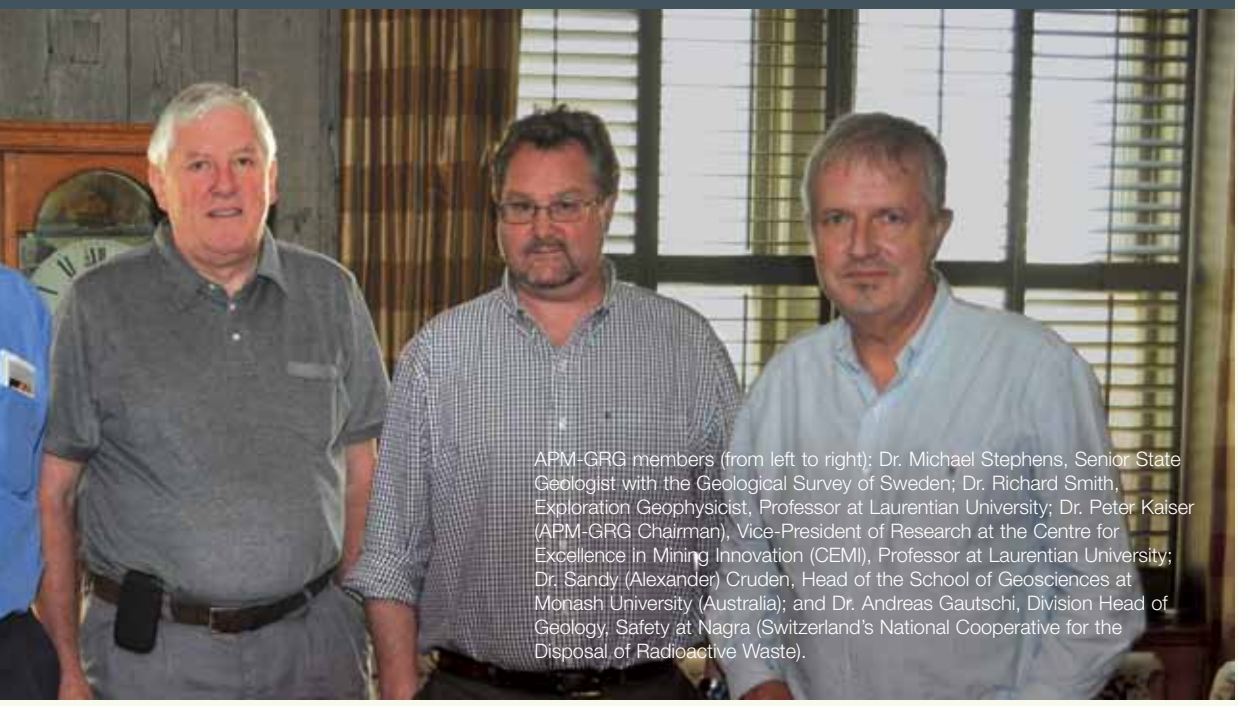
Introducing the Adaptive Phased Management Geoscientific Review Group (APM-GRG)

In 2011, the APM-GRG was established to provide advice and guidance on the approach, methods and findings of the geoscientific preliminary assessments that are part of the studies conducted in Step 3 of the site selection process. The group held its second meeting in August 2012, at which time it met with NWMO staff and consultants working on Phase 1 geoscientific assessments.

Phase 1 Community Well-Being Studies

These studies are designed to develop a deeper understanding of the community and how its well-being (social, cultural and economic) might be affected by the project. Key questions include:

- What is the community's capacity to host the project (e.g., decision-making processes, infrastructure and labour), or to develop the capacity to host the project with the assistance of the NWMO?
- How does the project align with the objectives and/or vision the community has for itself (its values, sensitivities and concerns), and how is the community expected to benefit from the project both in the near term and over the long term?
- Can the well-being of the community be enhanced if it is selected to host the project?
- Are there likely to be social and economic pressures that will need to be managed? Can these pressures be successfully managed?



APM-GRG members (from left to right): Dr. Michael Stephens, Senior State Geologist with the Geological Survey of Sweden; Dr. Richard Smith, Exploration Geophysicist, Professor at Laurentian University; Dr. Peter Kaiser (APM-GRG Chairman), Vice-President of Research at the Centre for Excellence in Mining Innovation (CEMI), Professor at Laurentian University; Dr. Sandy (Alexander) Cruden, Head of the School of Geosciences at Monash University (Australia); and Dr. Andreas Gautschi, Division Head of Geology, Safety at Nagra (Switzerland's National Cooperative for the Disposal of Radioactive Waste).

Step 3

Step 3 Activities in 2012

The NWMO's work in Step 3 communities was focused on working collaboratively with them to initiate and conduct preliminary assessments. To facilitate the exchange of information, both about the site selection process and preliminary assessments, the NWMO worked with local councils to establish CLCs. By the end of 2012, eight CLCs had been established.

To assist in their communications and engagement activities, the NWMO provided support for the CLCs to establish their own newsletters and websites. NWMO staff responded to questions channelled through the CLCs, and attended each of their meetings, providing technical expertise in such areas as geoscience, transportation and communications.

The NWMO's support for CLCs in 2012 also included opening local offices in Creighton, Ear Falls, Hornepayne, Ignace, Pinehouse, Schreiber and Wawa.

Introducing the Community Liaison Committees (CLCs)

Composed entirely of local residents, these working groups help facilitate learning in the community. With this in mind, the CLCs perform several vital functions, among them helping to develop an accurate description of their community and the surrounding region, keeping residents informed about the results of preliminary assessments, making sure that residents' concerns are addressed, and tailoring information sessions to meet local needs so as to facilitate the entire community's involvement in learning about the project. Each committee's mandate is set by the community's council, and members are selected by the council. Administrative expenses are covered by the NWMO, along with funding for a halftime administrative assistant, third-party expert advice, and community planning exercises.

The Role of Aboriginal Communities in Preliminary Assessments

Aboriginal engagement played a major role in the NWMO's Step 3 activities in 2012. When a community enters Step 3, the NWMO's practice is to send letters to all potentially affected Aboriginal communities in the region. The letters inform them of the decision taken by their neighbour, and ask for an opportunity to provide a briefing on the work currently underway and to discuss the role the Aboriginal community might wish to play in the process. The goal in each case is to encourage collaboration and mutual learning. The NWMO also works with mayors and councils to help them engage these Aboriginal communities in the learning process and to begin to build the kinds of relationships required for shared planning.

Learning From Independent Experts

As in previous years, the NWMO continued to provide community leaders access to independent experts. One such opportunity was the 2012 International Conference on Geological Repositories (ICGR), highlighted in *Adapting Plans*. This was an important opportunity for community leaders to learn how other countries and other community leaders are approaching the site selection process. The NWMO invited each of the Step 2 and Step 3 communities to send two community leaders to the conference. At the same time, the NWMO invited each association represented on the Municipal Forum to send a representative to the ICGR.

In addition to participating in the conference, community representatives met separately with John Heaton, a former New Mexico legislator involved in Carlsbad's decision to host a repository for transuranic waste (the Waste Isolation Pilot Plant), and Jacob Spangenberg, the mayor of the municipality (Östhammar) that has agreed to host Sweden's deep geological repository.

As described in *Adapting Plans*, CNSC staff also made themselves available to brief interested communities, and answer their questions about the regulatory framework governing used nuclear fuel management and the organizations involved in enforcing those regulations. CNSC staff in Ottawa hosted leaders from several Step 2 communities and visited CLCs in two Step 3 communities.

Jacob Spangenberg talks to Canadian community leaders about the process leading to his municipality's being selected to host Sweden's deep geological repository.

What Communities Wanted to Know

The communities participating in the site selection process had numerous comments, questions, and suggestions for the NWMO, as did communities in the surrounding areas. Their input was received through several channels, including correspondence and email, open houses and other local events, and the CLCs described earlier.

In addition to one-on-one discussions and direct correspondence, NWMO staff provided answers through such vehicles as the Frequently Asked Questions page on the organization's website (www.nwmo.ca/faqs), the published and online series *Ask the NWMO*, backgrounders addressing specific aspects of APM, and brochures on more detailed descriptions of key components of the project. Among the latter were *Safe and Secure Transportation of Canada's Used Nuclear Fuel* and *Description of Canada's Repository for Used Nuclear Fuel and Centre of Expertise*, both of which were completed in 2012 and posted online at www.nwmo.ca/brochures.

The input received in 2012 reflected a growing awareness among people engaged in the site selection process. As a whole, comments and questions were more detailed than in previous years, and branched out from an earlier focus on technological issues to include the project's potential effects on community well-being. There was also considerable interest in having more details about how the project might be implemented in a host community.

The most commonly voiced comments, concerns and questions fell under five broad categories: health and safety; technical aspects of the project; the site selection process; transportation; and the project's potential impact on the community and local economy.

Health and Safety

This category elicited the most interest. Local residents requested more information about the estimated effects of radiation on humans and animals, as well as on local and regional environmental features, such as aquifers, watersheds and the Great Lakes. The perceived health and safety risks associated with used nuclear fuel and nuclear materials in general were also the basis for the interest shown in the security and protection of the fuel, both in transit to the repository and once placed in it.

Technical Aspects of the Project

Questions about the size and capacity of the repository were frequent, as were questions about the cost of implementing APM and the technical criteria for selecting a site.

The Site Selection Process

There was considerable interest in knowing how communities have become involved in the process and how the willingness of a community to host the project will be assessed. How a site will be selected was another subject that came up frequently, as were the steps being taken to engage in decision-making the people in and around the community, including Aboriginal peoples and other important opinion leaders.

Transportation

This category reflected the paramount importance local residents attach to public safety. In addition to general questions about the safe transportation of used nuclear fuel, there were specific questions about the NWMO's emergency response planning, specific modes of transportation (truck, train, ship) and potential transportation routes. There were also questions about how the last two variables (modes and routes) might affect existing infrastructure in the community.

The Project's Potential Impact on the Community and Local Economy

Questions about the potential benefits associated with hosting the repository and centre of expertise were common, leading the NWMO to develop more detailed job estimates and more detailed information about the types of facilities that will be constructed above the site. Interest in land use issues is a recent development, with a particular focus on how land will be acquired for the repository and how the project might affect property values and the tourist sector in the area. To help answer these and other questions, the NWMO also produced a detailed brochure (*Description of Canada's Repository for Used Nuclear Fuel and Centre of Expertise*) and posted it online at **www.nwmo.ca/brochures**.

People have many questions about transportation. What type of transport package will be used to safely and securely contain the used nuclear fuel? Who regulates shipments? How will safety be assured? How do other countries transport their own radioactive waste? How much exposure to radiation is there? These questions and more are answered in *Safe and Secure Transportation of Canada's Used Nuclear Fuel*, available online at **www.nwmo.ca/brochures**.

Transportation: Planning for the Safe Transportation of Used Nuclear Fuel

As the site selection process moves forward, transportation planning will play an increasingly important role in the NWMO's work. In identifying preferred transportation modes and routes, the NWMO will actively seek input both from potential host communities and from communities along potential transportation routes. As noted in *Adapting Plans*, many of the questions and comments from communities were on transportation. To help address these issues, the NWMO produced a detailed brochure called *Safe and Secure Transportation of Canada's Used Nuclear Fuel*.

Looking Ahead: Phase 2 Studies and Beyond

Looking ahead, it is anticipated that a subset of communities, those with the strongest potential to be suitable to host the project, will be identified as the focus of more detailed Phase 2 studies. The greater detail of Phase 2 studies, in turn, will further narrow the field of potential communities or siting areas, probably to one or two, with the greatest suitability for the project. These communities, should they continue to be interested, would be the focus of Step 4 activities. As with the preceding steps, a community must formally express its willingness to proceed to the next step in the site selection process.

Optimizing Repository Designs and Further Increasing Confidence in Safety

STRATEGIC OBJECTIVE

The NWMO will refine and further develop the generic designs and safety cases for a repository for used nuclear fuel in both crystalline and sedimentary rock formations, and conduct technical research and development to ensure continuous improvement, consistent with best practices.

The Adaptive Phased Management (APM) technical program is focused on continuous improvement of designs and illustrative safety analyses for a deep geological repository where Canada's used nuclear fuel may be safely contained and isolated on an indefinite basis.

As part of the APM technical program, the NWMO undertakes joint research projects with Canadian universities, international organizations, and its counterparts in other countries, including, most notably, those of Sweden (SKB), Switzerland (Nagra), Finland (Posiva), and France (Andra). The technical program is reviewed annually by an Independent Technical Review Group (ITRG), which was established by the NWMO Board. An important part of the ITRG's work is to evaluate the sufficiency of the program to meet requirements of APM implementation.

The APM technical program's work falls under three broad categories: repository engineering, geoscience and repository safety. The highlights of each area's achievements in 2012 are described on the next pages, followed by an overview of the different ways (reports, papers, conferences, collaborative research with universities, and joint projects with international organizations) all three areas of the technical program maintain the technical capability necessary for the safe implementation of APM.

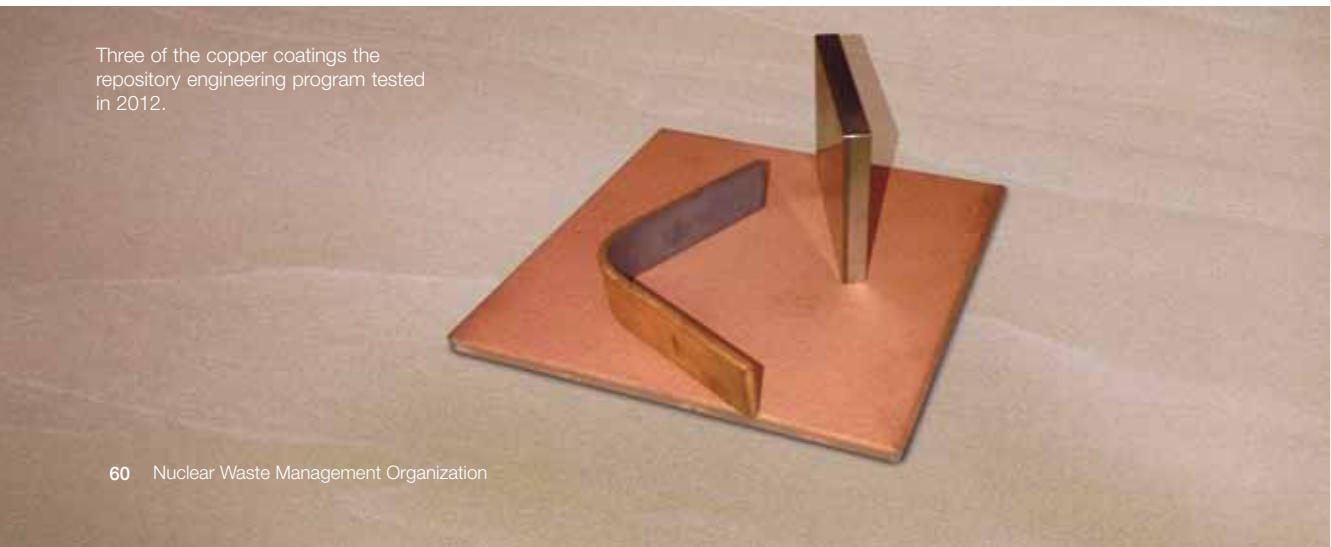
Repository Engineering

The main objectives of the repository engineering design program are to: 1) develop the engineering data, models, methods and tools necessary to advance and optimize the conceptual designs for a repository project and associated systems; 2) provide required engineering data inputs for the safety assessment of the repository project concepts; 3) support planned site characterization and subsurface investigation activities; and 4) provide engineering designs necessary to support APM repository cost estimates.

Container-Related Work

The containers in which used nuclear fuel will be stored must be able to withstand corrosion over the long term. For this reason, the engineering program has been testing different options for encasing the containers in copper, including, most notably, copper coatings and copper shells. In 2012, the NWMO continued to work collaboratively with Switzerland's nuclear waste management organization (Nagra) on developing copper coatings for repository containers using Canadian technologies developed by the National Research Council, the University of Ottawa, the University of Windsor and the University of Toronto.

Tests at the University of Western Ontario subjected the coatings to conditions consistent with those found in a repository project, where a progression from a dry aerobic to a wet anaerobic environment is expected. Further experiments were designed at the University of Toronto to test coating performance in the highly saline environments that occur in sedimentary rock formations in southern Ontario. All tests have confirmed the excellent corrosion protection capability of the copper coating. These results were presented at the International Society of Electrochemistry Annual Meeting in Prague, Czech Republic.



Three of the copper coatings the repository engineering program tested in 2012.

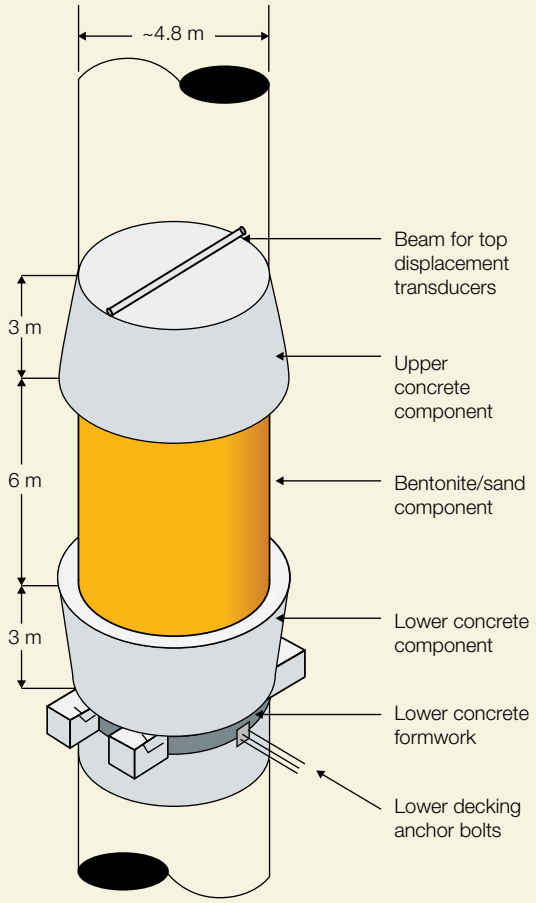
Other work included corrosion tests of wrought and welded steel in a repository environment. Samples produced in Canada are being tested at the international Mont Terri underground research laboratory in Switzerland.

Advanced welding technologies were also investigated in 2012. Laser welding is being explored at the Centre spécialisé de technologie physique du Québec, one of the world's foremost laser development facilities, while a friction stir welding review is underway in the United States.

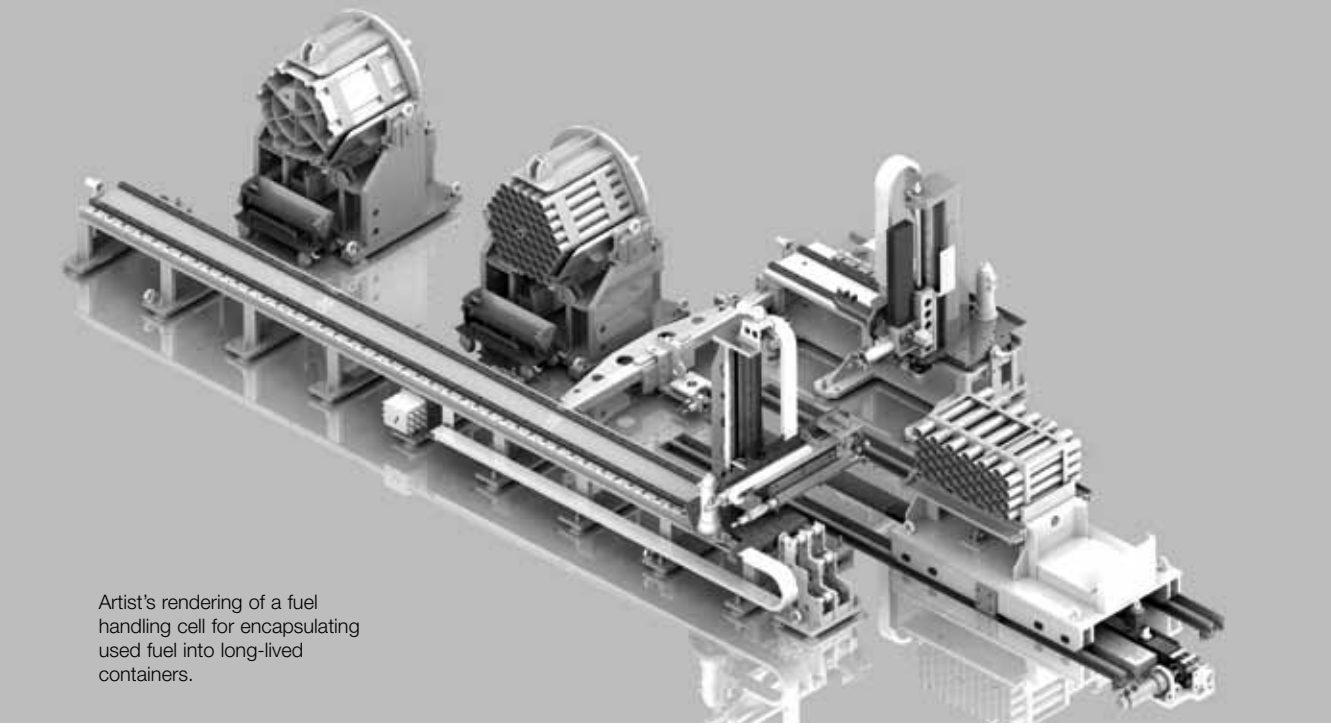
As well, the repository engineering program evaluated different container sizes for their manufacturability.

The Enhanced Sealing Project

Properly sealing the access shaft is an important element in the safe decommissioning and closing of a deep geological repository. The Enhanced Sealing Project, which began in 2010, is an extended test of whether a seal can remain mechanically stable over long periods of time. In 2012, work continued on monitoring the instrumented shaft seal, which was placed in the access shaft of the now decommissioned Atomic Energy of Canada Limited Underground Research Laboratory in Manitoba. Conducted in collaboration with SKB and Posiva, this experimental work has so far shown that the seal has remained mechanically stable and that the clay-based component has undergone substantial water uptake in the perimeter regions.



The Enhanced Seal



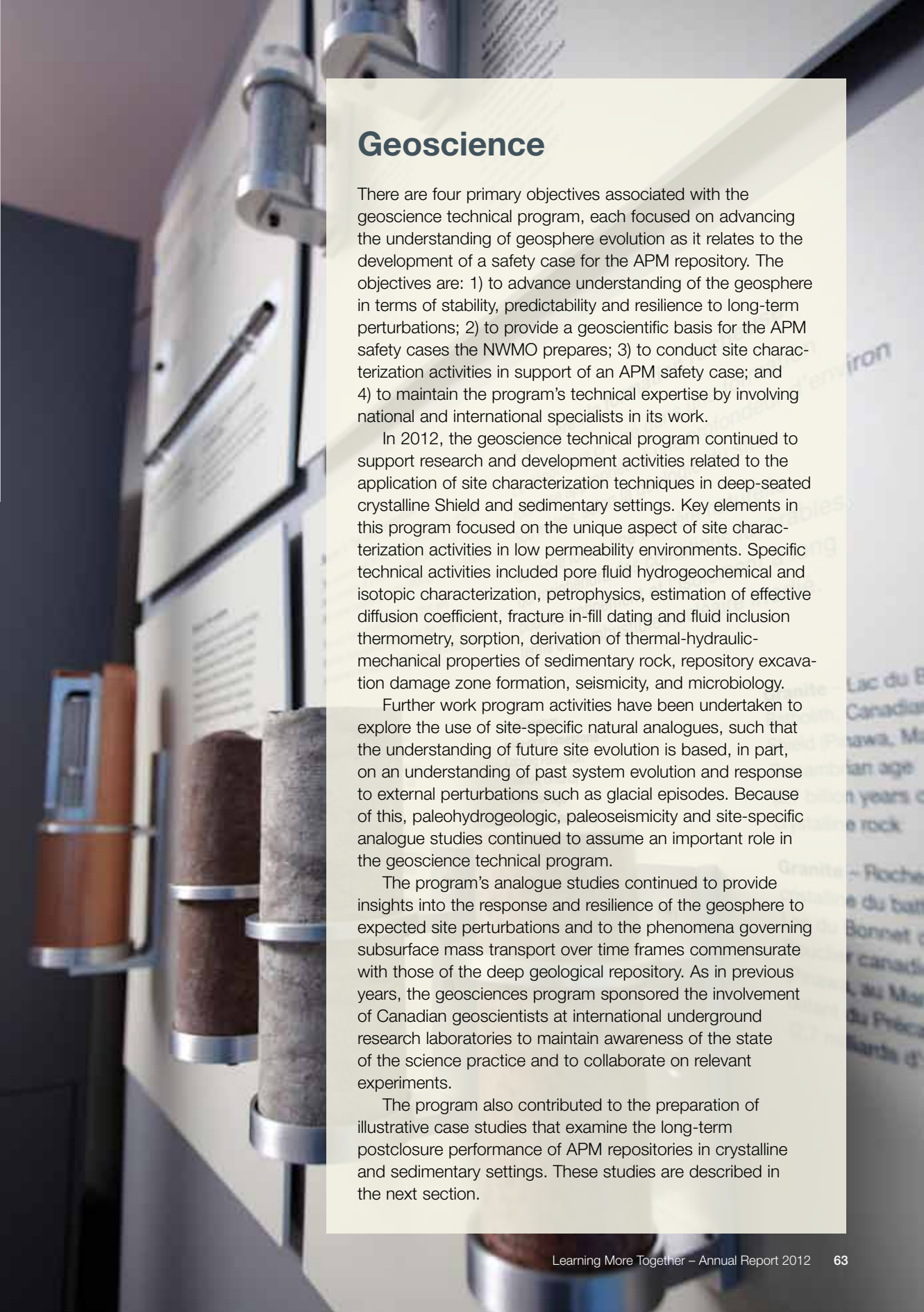
Artist's rendering of a fuel handling cell for encapsulating used fuel into long-lived containers.

Used Fuel Encapsulation

The repository engineering program continued design work on the process to receive and encapsulate used nuclear fuel into long-lived corrosion-resistant containers for placement in a repository. An important milestone was reached in 2012 with the preparation of conceptual designs for handling, transfer, container-loading, and container-sealing.

Transportation Studies

The repository engineering program initiated a logistics study to investigate methods and associated costs for transferring fuel from reactor sites to the repository facility. In a separate analysis of the current reference transport package, radiological dose values were confirmed to be several orders of magnitude below regulatory limits. To make sure that the exposure is as low as reasonably achievable (ALARA), the NWMO began reviewing the used fuel transportation package design to further improve its neutron shielding performance. This work resulted in a reduction in dose to half the previous values.



Geoscience

There are four primary objectives associated with the geoscience technical program, each focused on advancing the understanding of geosphere evolution as it relates to the development of a safety case for the APM repository. The objectives are: 1) to advance understanding of the geosphere in terms of stability, predictability and resilience to long-term perturbations; 2) to provide a geoscientific basis for the APM safety cases the NWMO prepares; 3) to conduct site characterization activities in support of an APM safety case; and 4) to maintain the program's technical expertise by involving national and international specialists in its work.

In 2012, the geoscience technical program continued to support research and development activities related to the application of site characterization techniques in deep-seated crystalline Shield and sedimentary settings. Key elements in this program focused on the unique aspect of site characterization activities in low permeability environments. Specific technical activities included pore fluid hydrogeochemical and isotopic characterization, petrophysics, estimation of effective diffusion coefficient, fracture in-fill dating and fluid inclusion thermometry, sorption, derivation of thermal-hydraulic-mechanical properties of sedimentary rock, repository excavation damage zone formation, seismicity, and microbiology.

Further work program activities have been undertaken to explore the use of site-specific natural analogues, such that the understanding of future site evolution is based, in part, on an understanding of past system evolution and response to external perturbations such as glacial episodes. Because of this, paleohydrogeologic, paleoseismicity and site-specific analogue studies continued to assume an important role in the geoscience technical program.

The program's analogue studies continued to provide insights into the response and resilience of the geosphere to expected site perturbations and to the phenomena governing subsurface mass transport over time frames commensurate with those of the deep geological repository. As in previous years, the geosciences program sponsored the involvement of Canadian geoscientists at international underground research laboratories to maintain awareness of the state of the science practice and to collaborate on relevant experiments.

The program also contributed to the preparation of illustrative case studies that examine the long-term postclosure performance of APM repositories in crystalline and sedimentary settings. These studies are described in the next section.

Repository Safety

The objective of the repository safety program is to evaluate the operational and long-term safety of any candidate repository site in order to assess and improve the safety of the proposed facility. In the near term, before any candidate site has been proposed, the safety objective is addressed through case studies and continuous improvements to our understanding of important features and processes.

Case studies are important because they provide valuable feedback to the NWMO on the safety of a deep geological repository. They also provide direction for further work to improve repository designs and methods to assess the safety of the system. The NWMO's Fourth Case Study, initiated in 2011 and completed in 2012, builds on the series of postclosure safety assessments for a deep geological repository in Canada. This and previous studies are based on hypothetical crystalline rock sites. The study completed in 2012 included the latest conceptual repository design, geoscience knowledge, and safety assessment methods. Its purpose was to show how the conceptual repository design and safety assessment approach address general Canadian Nuclear Safety Commission (CNSC) expectations, including those of the CNSC Guide G-320, *Assessing the Long Term Safety of Radioactive Waste Management*. The Fourth Case Study considered a hypothetical site using geologic data representing a crystalline Canadian Shield setting, and calculated potential radiological and non-radiological impacts to humans and non-human biota for a range of future scenarios that include the expected normal evolution of the repository, variance of key repository features, events and processes, and a number of disruptive event scenarios, bounding calculations and "what-if" scenarios.

Safety analyses were also initiated for the Fifth Case Study, a postclosure safety assessment for a deep geological repository for a hypothetical used fuel in a sedimentary rock setting.

Integrating and Sharing New Knowledge

International conferences are an important vehicle for integrating and sharing the NWMO's research. One of these events is the NWMO's annual Geoscience Seminar, which held its 10th meeting in June. The seminar brings together researchers from academia and industry, including NWMO geoscientists and the graduate students the organization sponsors through the Natural Sciences and Engineering Research Council's Industrial Postgraduate Scholarships Program. Among this year's attendees were researchers from 11 Canadian universities and the NWMO's sister organizations in Sweden (SKB) and Switzerland (Nagra).

NWMO geoscientists also showcased their work at the annual V.M. Goldschmidt Conference, which was held this year in Montreal. The NWMO helped host two sessions: *Geochemical and microbiological site characterization methods in low-permeability and low-porosity formations* and *Assessing groundwater transport processes using natural geochemical tracers*. Contractors working with the NWMO had an opportunity to present results from their work on deep geological repositories, as did the graduate students the NWMO supports.

Partnerships With Universities

Research partnerships with universities continued to play an important role in ensuring the NWMO's technical work is scientifically rigorous. Researchers at the University of Toronto, the University of Alberta, the University of British Columbia, Université Laval, McGill University, the University of New Brunswick, the University of Ottawa, Queen's University, the University of Waterloo, Ryerson University, the University of Saskatchewan, the University of Windsor, and the University of Western Ontario all worked on APM-related projects, as did researchers at the University of Bern, Virginia State University, and the University of Virginia. Another important development in 2012 was the establishment of the Geomechanics Working Group. One of the features of this group is that it allows for inter-laboratory testing at the University of Toronto, McGill University and Queen's University.

Support for Post-Secondary Training

Seven of the researchers attending the NWMO's annual Geoscience Seminar (described earlier) were graduate students supported by the NWMO in collaboration with the Natural Sciences and Engineering Research Council through the Industrial Postgraduate Scholarships Program. The NWMO also supports post-secondary education and training through its participation in the University Network of Excellence in Nuclear Engineering (UNENE). UNENE is a non-profit corporation that brings together Canadian universities, nuclear power utilities, and research and regulatory agencies to help develop the country's capacity for training nuclear energy professionals and conduct research in the field.

Dr. Darren Korber, a professor at the University of Saskatchewan, analyzes a core sample from the Mont Terri underground research laboratory in Switzerland. NWMO researchers have for several years been participating in the work done at the Mont Terri laboratory.

International Partnerships

Partnering with other radioactive waste management organizations allows the NWMO to foster international co-operation on research, development and demonstration of technology, learn from other countries' experience, and keep abreast of developments in repository design and safety case development for various host rock formations.

The Äspö Hard Rock Laboratory Agreement between the NWMO and SKB, renewed in 2011, enabled the NWMO to continue its active participation in joint underground research and demonstration of repository technology in crystalline rock. As in previous years, SKB and Posiva were the NWMO's partners in the Greenland Analogue Project, an ongoing research project looking at how an ice sheet affects the groundwater flow and water chemistry around a repository in crystalline bedrock during glacial events. The NWMO continued to participate in the Task Force on Engineered Barrier Systems, the Long-Term Test of Buffer Material, and the Large-Scale Gas Injection Test.

The NWMO also continued its participation in the Mont Terri underground research laboratory in Switzerland, which is focused on underground studies and demonstrations of repository technology in sedimentary rock. The NWMO remained an active participant in the European Commission Fate of Repository Gases Project, a collaborative development and comparison of models for gas transport in field-scale experiments and a generic repository.

The NWMO continued to support the Nuclear Energy Agency's (NEA) Thermodynamic Database Project, which is developing a quality-assured database for key elements in radioactive waste management systems. The NWMO also continued to participate in the NEA's Integration Group for the Safety Case, which is in the process of completing a report on current practices for conducting safety assessments. The NWMO is a member of BIOPROTA, an international forum on biosphere modelling for radioactive waste facilities.

In addition to these organizations, NWMO researchers also collaborated with researchers from the United States Geological Survey, the Geological Survey of Finland, and swisstopo, Switzerland's geoinformation centre.

Providing Financial Surety

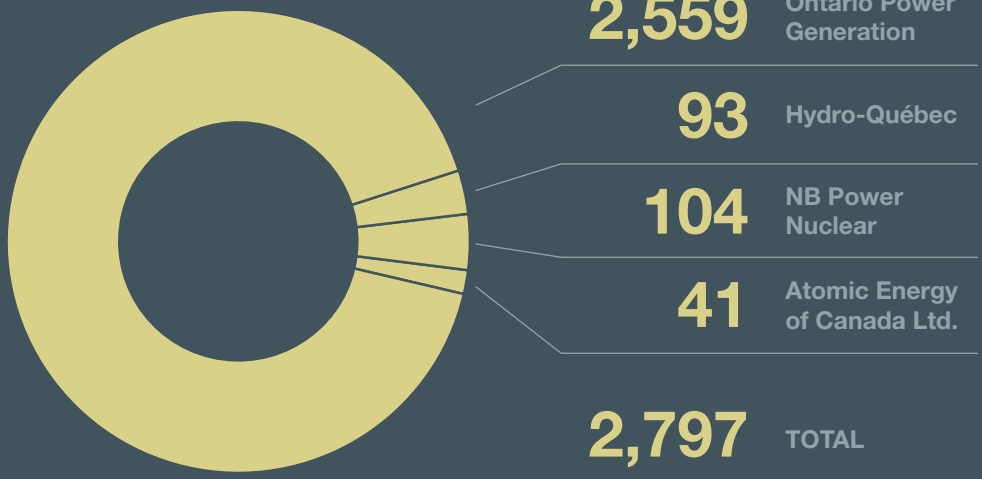
STRATEGIC OBJECTIVE

The NWMO will ensure funds are available to pay for the safe, long-term management of Canada's used nuclear fuel.

The *Nuclear Fuel Waste Act* (*NFWA*) specifically addresses the future financial obligations for managing used fuel over the long term. The legislation requires the establishment of trust funds by each waste owner. The funds were established in 2002, and annual contributions have been made by each waste owner since. The total value of these funds, including investment income, was approximately $2.8 billion at the end of 2012. This money is in addition to other segregated funds and financial guarantees the companies have set aside for nuclear waste management and decommissioning.

Trust Fund Balance

December 2012 ($ million)



Experience in other countries has demonstrated the importance of safeguarding these funds so that they will be preserved for their intended purpose. The *NFWA* built in explicit provisions to ensure that the trust funds are maintained securely and used only for their intended purpose. The NWMO may have access to these funds only for the purpose of implementing the management approach selected by the Government once a construction or operating licence has been issued under the *Nuclear Safety and Control Act* (*NSCA*).

These legislated obligations are the responsibilities of the individual companies named, and not the responsibility of the NWMO. The trust funds are noted here because of their significance in the overall provision for long-term nuclear waste management.

As required by the *NFWA*, the NWMO makes public the audited financial statements of the trust funds when they are provided by the financial institutions annually. They are posted at www.nwmo.ca/trustfunds.

In addition, the NWMO is required to provide a range of financial information in each of its annual reports following the Government's decision, as defined in Subsection 16(2) of the *NFWA*.

Financial Guarantees as Required by *NFWA* Section 16(2)(a)

As specified in the *NFWA*, this annual report provides the form and amount of the financial guarantees that all NWMO members – Ontario Power Generation (OPG), Hydro-Québec (HQ) and NB Power Nuclear (NBPN) – have provided to the Canadian Nuclear Safety Commission (CNSC). These guarantees for the year 2013 total $15.6 billion and are provided to cover the total cost (in present value terms) of managing the decommissioning of all reactors and permanently managing all nuclear waste (including used nuclear fuel) produced to date. A large portion of these guarantees, approximately $13.5 billion (as of year-end 2012), exists in segregated funds dedicated to nuclear waste management and decommissioning, with the remainder in the form of Provincial Guarantees.

Details of the status of these guarantees are presented in Attachment 1.

Total Cost Estimate as Required by *NFWA* Section 16(2)(b)

The *NFWA* requires the NWMO to address the cost and funding of the long-term management of used nuclear fuel. A full update of the cost estimates for the Adaptive Phased Management (APM) program was commenced by the NWMO in 2009 and completed in 2011. This estimate provides the basis for financial planning and trust fund deposits for future years.

In producing an estimate for the long-term planning around the APM program, a number of system design and costing assumptions were adopted to guide the projections. Among these were:

A. Engineering and conceptual design assumptions for the deep geological repository and transportation.
B. Assumed repository capacity of 3.6 million fuel bundles.
C. An in-service date of 2035 for the deep geological repository.
D. Closure of repository in 2160.

Each component of APM costs was systematically addressed to develop a full lifecycle cost estimate. Allowances and contingencies are also included in the APM cost estimate to account for cost risks.

The updated cost estimate for the APM program for managing 3.6 million used nuclear fuel bundles is $17.9 billion (2010 $) or present value of $7 billion (2010 $). This cost estimate will form the baseline from which cost estimates for a used fuel inventory greater than 3.6 million can be derived.

When updated to January 1, 2013, present value, the estimated cost of APM is $8.1 billion (for liabilities from 2013 onwards). Of the $8.1 billion, approximately $6.7 billion is the estimated cost of developing and building a repository, transporting the used fuel and operating the repository for the 2.3 million fuel bundles produced as of the end of June 2012. The costs of interim storage at the reactor sites and recovery of the used fuel from storage are not included as part of the $8.1 billion cost estimate since they are the responsibility of the waste owners.

Cost to Be Funded Through the *NFWA* Trusts

The $6.7 billion present value cost estimate of a deep geological repository for the 2.3 million used fuel bundles includes $1.9 billion to develop the repository to a point of obtaining a construction licence, and $4.7 billion to complete construction, transport the fuel to the repository, and operate, close and monitor the repository. The *NFWA* requires that post-construction licence costs (currently estimated at $4.7 billion) must be funded through contributions to the *NFWA* trust funds established by OPG, HQ, NBPN and AECL. As of December 2012, the total value of these funds including investment income was approximately $2.8 billion.

Budget Forecast for 2013 as Required by *NFWA* Section 16(2)(c)

In addition to making financial provision for post-construction licence costs, the NWMO will incur costs of approximately $1.9 billion (as stated in present value as of January 1, 2013) to site the long-term management option, develop its detailed design, evaluate its environmental impacts, and obtain a site preparation and construction licence from the CNSC. For 2013, the NWMO Board of Directors approved a budget envelope of $57.3 million. Annual costs beyond 2013 are subject to further review. Sharing of these costs will be in accordance with the percentages defined in the funding formula.

Funding Formula as Required by *NFWA* Section 16(2)(d)

In accordance with the requirements under the *NFWA*, the NWMO proposed a funding formula to address the future financial costs of implementing the APM approach in its 2007 Annual Report. This followed the Federal Government's selection, in June 2007, of the APM approach for the long-term management of used fuel. The funding formula, based partly on projections of used fuel to be generated by each waste owner, allocates liabilities to each of the corporations for their portion of the estimated total cost. It identifies trust fund contributions by each nuclear waste owner for their portion of the estimated total cost. The funding formula was approved by the Minister of Natural Resources in April 2009.

Cost Sharing

For the purpose of sharing NWMO costs, cost sharing has initially been done based on the number of fuel bundles produced as of June 30, 2006, adjusted to account for the assumed timing of transfer of used fuel to the repository. For OPG, this transfer is assumed to start in 2035. For HQ, NBPN and AECL, this transfer is assumed to start in 2050. The resulting cost-sharing percentage among the waste owners is approximately: OPG: 90.8%, HQ: 3.9%, NBPN: 4.2%, and AECL: 1.2%. These cost-sharing percentages have not changed since the funding formula was approved by the Minister of Natural Resources in April 2009.

These percentages apply to the sharing of both pre- and post-construction costs. Costs specific to a nuclear fuel waste owner, such as special fuel, and special transportation costs that are owner-specific, are attributed to the owner.

Possible Future Reactors

In response to the request of the Minister of Natural Resources, discussions were held with a number of stakeholders regarding the development of a funding formula that could apply to possible new waste owners and used fuel from new reactors. The results of the discussions are summarized below:

1. The principles used in the approved funding formula are reasonable and should apply to new owners and new reactors.
2. Fixed and variable costs and investments made to date need to be considered in any new funding formula for new owners and new reactors.
3. The characteristics of new fuel types must be considered.
4. The existing funding formula should be developed when specific circumstances are clear for new reactors and new owners.
5. The changes in the funding formula for new owners of new reactors may be different than the changes for an existing owner with new reactors.

The NWMO proposed to apply the above principles to specific circumstances related to new owners and new reactors when they arise.

Trust Fund Deposits 2007 to 2012 as Required by *NFWA* Section 16(2)(e)

Beginning in 2002, used nuclear fuel waste owners have been making annual contributions to the *NFWA* trust funds. The contributions for each waste owner are as follows:

Contributions to *NFWA* Trust Funds

($ million)

2012

	OWNERS
149	Ontario Power Generation
8	Hydro-Québec
5	NB Power Nuclear
1	Atomic Energy of Canada Ltd.
163	TOTAL

2011

139	Ontario Power Generation
7	Hydro-Québec
5	NB Power Nuclear
2	Atomic Energy of Canada Ltd.
153	TOTAL

2010

136	Ontario Power Generation
7	Hydro-Québec
4	NB Power Nuclear
2	Atomic Energy of Canada Ltd.
149	TOTAL

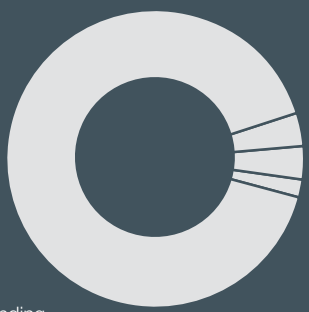
2009*

153	Ontario Power Generation
9	Hydro-Québec
14	NB Power Nuclear
2	Atomic Energy of Canada Ltd.
178	TOTAL

2008

100	Ontario Power Generation
4	Hydro-Québec
4	NB Power Nuclear
2	Atomic Energy of Canada Ltd.
110	TOTAL

2007



100	Ontario Power Generation
4	Hydro-Québec
4	NB Power Nuclear
2	Atomic Energy of Canada Ltd.
110	TOTAL

*2009 contributions include additional funding required for 2008 contributions under the funding formula approved in April 2009.

Trust Fund Deposits for 2013 as Required by *NFWA* Section 16(2)(e)

The *NFWA* trust fund deposits for 2013 stated herein have been developed based on the approved funding formula. Under this funding formula, the funding for the post-construction licence costs is divided into two parts:

1. Funding for historical used fuel bundles (Committed Liability)
2. Funding for used fuel to be produced each year (Future Liability)

Committed Liability represents all costs that will be incurred regardless of whether any further used fuel bundles are generated in the future. This liability includes all fixed costs for the facility and variable costs attributed to the historical used fuel bundles. Contributions for the "committed" liability are to be amortized to the year 2035 in equal present value payments. The rationale for this amortization period is that 2035 is consistent with the earliest planned date when the deep geological repository would be available. This funding method has the advantage of distributing the funding obligations evenly to each year, taking into account the time value of money.

Future Liability represents the incremental cost of transferring to the repository, facility expansion, and additional operating and monitoring costs of used fuel bundles to be produced each year. Each future used fuel bundle would incur the same cost in present value terms, taking into account the time value of money.

The 2013 Trust Fund Deposits are shown on the next page.

Trust Fund Balance

December 2012 ($ million)

OWNERS	
2,559	Ontario Power Generation
93	Hydro-Québec
104	NB Power Nuclear
41	Atomic Energy of Canada Ltd.
2,797	TOTAL

Deposits to Trust Funds*

(Committed and Future Bundles)
2013 ($ million)

OWNERS	
154	Ontario Power Generation
8	Hydro-Québec
5	NB Power Nuclear
1	Atomic Energy of Canada Ltd.
168	TOTAL

*Annual trust fund deposits are required to be made within 30 days of the submission of the Annual Report. A deposit date of April 30 is assumed for illustrative purposes.

ATTACHMENT 1

Financial Guarantee Status – Used Fuel Owners

Ontario Power Generation Inc.

Effective July 31, 2003, OPG provided the CNSC with a Decommissioning Financial Guarantee that included a guarantee associated with the long-term management of used fuel arising from the operation of OPG-owned nuclear stations and waste management facilities, including those leased by Bruce Power. The Decommissioning Financial Guarantee also covers liabilities associated with long-term management of low and intermediate level waste, as well as plant decommissioning.

Development and maintenance of the Financial Guarantee consider the following points:

- The Financial Guarantee covers the liability based on projected waste arising to year-end in any given year. As a result, the value of the used fuel Financial Guarantee changes annually to recognize the incremental cost associated with additional used fuel generated during that year.
- The initial Financial Guarantee submission covered the five-year period to year-end 2007. It has been updated twice since then in 2007 and 2012, respectively. The latest approved 2012 Financial Guarantee submission covered the period from January 2013 to year-end 2017.
- The Financial Guarantee is satisfied in part by the actual accumulation of funds within both a Used Fuel Fund and a Decommissioning Fund under the *Ontario Nuclear Funds Agreement* (*ONFA*) between OPG and the Province of Ontario. This value is supplemented by a Provincial Guarantee which is executed between the Province of Ontario and the CNSC.
- The *NFWA* Trust Fund forms part of the Used Fuel Fund under the *ONFA*.

The Provincial Guarantee Agreement provides an unconditional and irrevocable guarantee to supplement monies set aside by OPG in segregated funds, including the *NFWA* Trust Fund to satisfy the total Financial Guarantee required by the CNSC.

OPG submitted documents to the CNSC in 2012 to support its application to update the Financial Guarantee for the period from January 1, 2013, to year-end 2017. The CNSC hearing for this application was held in October 2012. The CNSC accepted the Financial Guarantee proposal on December 20, 2012.

The Annual Report to the CNSC for year 2013 shows a Financial Guarantee requirement of $14.162 billion. This will be satisfied by a 2012 year-end Used Fuel Fund balance of $6.998 billion, a Decommissioning Fund balance of $5.755 billion and a Provincial Guarantee of $1.551 billion for a total available guarantee of $14.304 billion.

The value of the OPG *NFWA* Trust Fund as of year-end 2012 is $2.559 billion. This value forms part of the segregated fund balance shown above.

Hydro-Québec

HQ has provided the CNSC with a Decommissioning Financial Guarantee of $685 million stated in present value as of June 30, 2016, that includes a guarantee associated with used fuel arising from the operation of Gentilly-2 and the cost of station decommissioning, including the long-term management of low and intermediate level radioactive waste.

- The total guarantee is made up of $340 million for decommissioning and long-term management of low and intermediate level radioactive waste, and $345 million for used fuel.
- The guarantee is in the form of an expressed commitment by the Province of Quebec to HQ that provides a guarantee of payment.
- The HQ *NFWA* Trust Fund contained $93 million and had an estimated fair value of $112 million as of December 31, 2012.

NB Power Nuclear

NBPN has provided the CNSC with a Decommissioning Financial Guarantee that includes costs associated with the long-term management of used fuel projected to be produced from the Point Lepreau Generating Station and the cost of station decommissioning, including the long-term management of low and intermediate level radioactive waste.

- The current used fuel financial guarantee is based on the present value of future costs to manage used fuel produced to the end of 2013. The fund will be increased annually based on future used fuel production estimates.
- The financial guarantee requirement is satisfied by three separate funds: a Used Fuel Fund, a Station Decommissioning Fund, and the *NFWA* Trust Fund.
- The total market value of the funds at December 31, 2012, was approximately $615 million and comprised the following:
  - Used Fuel Fund – $312 million
  - Station Decommissioning Fund – $199 million
  - *NFWA* Trust Fund – $104 million

Atomic Energy of Canada Limited

AECL is not a member of the NWMO. Its financial guarantee is in the form of an expressed commitment by the Government of Canada to the CNSC, combined with supporting estimates of the financial liability and the basis for same. The AECL *NFWA* Trust Fund contained approximately $41 million as of December 31, 2012.

Additional Information

Additional information is posted at www.nwmo.ca/backgrounders.

Adapting Plans

STRATEGIC OBJECTIVE

The NWMO will adapt plans for the management of used nuclear fuel in response to new knowledge, international best practices, advances in technical learning, evolving societal expectations and values, and changes in public policies.

Developing a deep geological repository is a long-term infrastructure project, spanning several decades. Because of the long timelines involved, Adaptive Phased Management (APM) includes mechanisms for incorporating new technologies as the plan unfolds. With this goal in mind, the NWMO maintains a robust research program and works with universities and international organizations to help ensure that Canada's plan for the long-term management of used nuclear fuel is based on the best available science.

Just as importantly, APM also includes numerous opportunities to refine and adjust the plan in the light of new ways of thinking. To keep its planning responsive to evolving societal values, the NWMO welcomes input from the project's many stakeholders, including the communities involved in the site selection process, Aboriginal communities, and the public at large. The NWMO also routinely solicits public input on its five-year implementation plans. These dialogues continued in 2012 and were supplemented by the NWMO's hosting of the fourth International Conference on Geological Repositories (ICGR).

Evolving Societal Expectations, and Refining Social Processes and Plans

The 2012 International Conference on Geological Repositories

The ICGR brings together senior-level decision-makers from countries advancing programs for the safe, long-term management of long-lived high-level radioactive waste in deep geological repositories. This year's conference, held in Toronto, Ontario, from September 30 to October 3, was hosted by the NWMO, in co-operation with Natural Resources Canada, the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD/NEA), the International Atomic Energy Agency (IAEA), the European Commission, and the International Association for Environmentally Safe Disposal of Radioactive Materials (EDRAM).

The theme, *National Commitment – Local and Regional Involvement*, highlighted the importance of responding to societal expectations in planning and developing deep geological repositories, and ensuring that repositories are developed by implementing organizations working co-operatively with host communities and regions, and overseen by national regulatory agencies. Individual sessions addressed:

- Perspectives of International Organisations;
- National Policies and Programmes;
- Safety of Geological Repositories;
- Learning From Indigenous Peoples;
- Implementers' Approaches;
- Meeting Societal Expectations and Adapting to Change; and
- The Experience of Local Communities and Regions.

More than 200 people, representing 15 countries, attended the conference. Participants included leaders from international organizations, representatives from Canadian communities involved in the site selection process, representatives from the municipal associations involved in the NWMO's Municipal Forum, Aboriginal peoples, officials from national regulatory agencies, and the heads of several national nuclear waste management organizations. The format, with its mix of presentations, panel discussions, and audience participation, was designed to maximize the exchange of ideas and to help participants learn from one another's experiences in advancing national programs for deep geological repositories for radioactive waste.

The proceedings can be viewed online at www.icgr2012.org/conference-proceedings.php.

Ken Nash, President and CEO of the NWMO, welcomes participants.

Serge Dupont, Deputy Minister of Natural Resources Canada, introduces the session *National Policies and Programmes*.

A question from the audience during the session *Perspectives of International Organisations*. The panellists (from left to right) are Alexander Bychkov of the IAEA; Luis Echávarri of the OECD/NEA; Marie-Claude Dupuis of France's National Radioactive Waste Management Agency – Andra; Ute Blohm-Hieber of the European Commission; and Bruce McKirdy of the UK's Nuclear Decommissioning Authority.

All the sessions were videotaped and posted on the ICGR website. Here, a technician records the session *The Experience of Local Communities and Regions*.

Panel discussion during the session *Safety of Geological Repositories*. Pictured (from left to right) are Gerald Hennenhöfer of Germany's Federal Ministry for Environment, Nature Conservation and Nuclear Safety; Catherine Haney of the United States Nuclear Regulatory Commission; André-Claude Lacoste of France's Nuclear Safety Authority; Magnus Vesterlind of the IAEA; Michael Binder of the Canadian Nuclear Safety Commission; Johan Anderberg of the Swedish Radiation Safety Authority; and Hans Wanner of the Swiss Federal Nuclear Safety Inspectorate.

Phil Fontaine, former National Chief of Canada's Assembly of First Nations, chairs the session *Learning From Indigenous Peoples*.

Bruce McKirdy of the UK's Nuclear Decommissioning Authority discusses long-term strategies during the session *Implementers' Approaches*.

Panel discussion during the session *Meeting Societal Expectations and Adapting to Change*. Pictured (from left to right) are Philippe Lalieux of Belgium's National Agency for Radioactive Waste and Enriched Fissile Materials – ONDRAF; Michael Aebersold of the Swiss Federal Office of Energy; Claudio Pescatore of the OECD/NEA; Ivo Kaplán of the Czech Republic's Radioactive Waste Repository Authority; and Jo-Ann Facella of the NWMO.

Soliciting Public Input on the NWMO's Draft Five-Year Implementation Plan

As it has been done in previous years, the NWMO solicited broad public input on its seven corporate strategic objectives and associated planned activities by publishing a draft of its rolling five-year strategic plan (*Implementing Adaptive Phased Management 2013 to 2017*) for public comment. A copy was posted on the NWMO website, while hard copies were mailed to individuals and organizations that had previously expressed an interest in NWMO activities, provincial and federal ministers and political representatives, and involved government departments. A five-question survey was posted on the organization's website and mailed with hard copies. All individuals who contributed their time and ideas were formally thanked by the NWMO.

Other Input

The NWMO continued to a) engage Canadians in a conversation about the appropriateness of the site selection process; and b) identify with them the refinements that will need to be made to that process as it is implemented and experience is gained. The highlights of these many discussions are outlined in the report (*What We Heard 2012*) posted online at www.nwmo.ca/what_we_heard.

The ongoing process of dialogue and learning identified several key opportunities for refinement to the organization's social processes and plans, as well as to its community-based activities.

One recommendation was that the NWMO do more to facilitate and sustain learning in the community. Communities involved in the site selection process recognized the importance of involving residents in learning and dialogue about the project, and noted the challenge of sustaining engagement and interest over the long timelines involved in selecting a site and then developing it. An important step toward addressing this need has been taken with the formation of community liaison committees in Step 3 communities. Together with the NWMO, these committees are working to develop activities that will help involve more community members in the site selection process.

Another recommendation was that the NWMO do more to involve surrounding communities and Aboriginal peoples in learning and decision-making. This was a priority for many community members, and to achieve it, interested communities and the NWMO continued to work to build the relationships necessary for considering and ultimately implementing the project on a regional level. Recognizing that building these relationships takes time, the NWMO planned additional outreach activities for 2013.

Several other opportunities emerged from the NWMO's ongoing dialogue with interested Canadians. These opportunities included:

- Building understanding of key concepts, such as radiation and risk;
- Building understanding of project components as part of the learning process;
- Ensuring informed dialogue that includes multiple perspectives; and
- Ensuring transparency in decision-making.

Incorporating Aboriginal Traditional Knowledge

The Assembly of First Nations made recommendations to the NWMO in two separate reports. The first, *Alternative Exposure Groups, Characteristics and Data for the Post-Closure Safety Assessment of a Deep Geological Repository*, advised the NWMO to provide more detail about the project's potential impact on Plains Hunter/Gatherers on the assumption that a deep geological repository could potentially be built in a plains environment. It also recommended closer attention to traditional diets and their potential to act as pathways for radiation exposure.

The second report, *Assembly of First Nations Nuclear Waste Management Traditional Decision-Making Consensus Building – Draft Tool Kit*, described the principles that go into traditional decision-making and consensus building, and as such, offered an invaluable insight into how the NWMO should go about seeking the involvement of Aboriginal communities potentially affected by the development of a repository.

The NWMO will act on these important recommendations in 2013.

Over the course of 2012, the NWMO held three workshops to enhance its understanding of Aboriginal Traditional Knowledge. These workshops helped inform the organization's processes, both in its social engagement activities and in its technical work. The NWMO will continue to explore ways for Traditional Knowledge to help shape all aspects of its work.

Traditional Elder setting a rabbit snare.

Keeping Abreast of Technical Issues and Advances

A program that is implemented over a long time will have many opportunities to improve safety and performance. Maintaining a robust research program is one of the ways the NWMO works to identify those opportunities. The organization also monitors developments in used fuel reprocessing and the Canadian energy policy that might have a bearing on the implementation of APM.

Ongoing Monitoring of Advances in Reprocessing Used Nuclear Fuel

One of the questions that is most frequently asked of the NWMO is whether used nuclear fuel, and used CANDU fuel in particular, can be recycled or reused. Reprocessing and partitioning involves the separation of potentially fissile materials, such as plutonium, from used nuclear fuel through the application of chemical and physical processes. A portion of this recovered material can then be recycled into some current reactor types as mixed oxide (MOX) fuel. The remainder is stored as radioactive waste. Reprocessing is practised in several countries that operate light water reactors, such as France and Japan. Transmutation is a possible next step and involves the conversion of long-lived radionuclides in the used fuel into shorter-lived ones through irradiation and/or fissioning in a reactor, usually an advanced reactor like a fast neutron reactor. This is not currently practised, although research to demonstrate its feasibility is underway in several countries. In 2005, the NWMO made a commitment to keep a "watching brief" on technological developments in the field, and it has been posting updates on its website since 2008.

In 2012, the NWMO continued to monitor the findings of international research and development programs in advanced fuel cycles, including reprocessing, partitioning and transmutation (RP&T), on waste management issues. Among the conferences the NWMO monitored were the Nuclear Fuel Cycle Conference sponsored by the UK Institution of Chemical Engineers, the Atalante 2012 Conference, and the OECD/NEA 12th Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation.

The current scientific consensus is that existing reprocessing technologies are not economically viable, especially for the un-enriched CANDU fuel used in Canadian nuclear power plants. In addition, they do not eliminate the need for a deep geological repository, as they result in a large number of chemically very complicated radioactive waste streams with long-lived radionuclides. These are often more difficult to manage than the original used fuel.

As in previous years, the NWMO posted its most recent *Watching Brief on Reprocessing, Partitioning and Transmutation* online at www.nwmo.ca/adaption.

Energy Policy

The NWMO continues to monitor the status of potential new or refurbished reactors for the implications of these industry developments on the quantities and characteristics of the used nuclear fuel that the organization may be asked to manage in the future. In 2012, the NWMO updated its inventory of the nation's used nuclear fuel. This is posted on the NWMO's website at www.nwmo.ca/technicalresearch.

Lessons from Fukushima

In response to the March 2011 earthquake and tsunami off the coast of Japan and the subsequent events at the Fukushima-Daiichi nuclear power plants, the NWMO examined the potential implications for the implementation of APM. The events at Fukushima were a strong reminder that the NWMO needs to ensure that it continues to consider a wide range of extreme events in its designs and safety analyses, and that it has an obligation to deal with uncertainty in its approach to the long-term management of Canada's used nuclear fuel. The NWMO's path forward will be refined as new knowledge and understanding are gained of extreme events, such as earthquakes, climate change and glaciation.

Lessons learned from Fukushima have been posted on the NWMO's website at www.nwmo.ca/faq_fukushima.

Planning for the Long Term

As part of the work it does on the international stage, the NWMO continued to participate in the NEA's International Collaboration on Preservation of Records, Knowledge and Memory Across Generations. The project supports the lengthy and complex decision-making processes that are inherent in the long operational and post-operational lifetimes of radioactive waste repositories.

The focus is on sharing international information, comparing approaches, testing potential solutions and sharing decisions.

Ensuring Governance and Accountability

STRATEGIC OBJECTIVE

The NWMO will maintain an accountable governance structure that provides confidence to the Canadian public in the conduct of the NWMO's work.

The integrity of the NWMO's work is advanced by multiple layers of oversight and peer review. Internally, the NWMO is governed by its Board of Directors. The *Nuclear Fuel Waste Act* (*NFWA*) also requires the Board to appoint an Advisory Council that has a mandate to review and comment on the work of the NWMO. There is also a four-member international Independent Technical Review Group (ITRG) that since 2008 has conducted annual reviews of the NWMO's technical program to evaluate whether appropriate scientific and engineering approaches are in place to support the implementation of Adaptive Phased Management (APM).

Externally, the NWMO reports to the Minister of Natural Resources Canada on an annual basis, as required by the *NFWA*. This annual report is tabled by the Minister in both Houses of Parliament, and the Minister issues a statement on it each year. Every three years, an expanded version of the annual report – the triennial report – is required under the *NFWA* and must also include the comments of the Advisory Council.

The end point of APM is a deep geological repository that will be regulated under the *Nuclear Safety and Control Act*. Any licensing decisions about a repository must meet the requirements of the *Canadian Environmental Assessment Act*, *2012*, and only then can the Canadian Nuclear Safety Commission (CNSC) make a determination on whether to license a site.

At each step along the way, the NWMO's work will meet or exceed all applicable regulatory standards and requirements for protecting the health, safety, and security of both humans and the environment. Just as importantly, the NWMO holds itself accountable to the public at large by posting key documents on its website, most notably annual reports, triennial reports, minutes from the meetings of the Board of Directors and Advisory Council, the reports of the ITRG and the NWMO's responses to them, research papers, and the results of the NWMO's engagement activities.

Highlights of these reporting and accountability activities from 2012 are discussed in the sections below.

Annual Report to the Minister of Natural Resources

As noted above, the *NFWA* requires the NWMO to submit an annual report to the Minister of Natural Resources. The 2011 Annual Report was submitted to the Honourable Joe Oliver in March 2012. In his formal response, the Minister expressed satisfaction with the number of communities expressing an interest in learning more about the project. "I am pleased, at this early stage of the Organization siting process, that communities are demonstrating an interest in learning about this project and considering the possibility of hosting the long-term waste management facility in the future," he said. The Minister also noted "with particular interest that the Organization has initiated dialogues with government agencies that are involved in overseeing and regulating the transportation of dangerous materials in Canada," and he encouraged interested Canadians and communities to read the report to "learn more about the progress it is making to address an important public policy issue."

Technical Review

Established in 2009, the ITRG conducts annual reviews of the NWMO's ongoing and future R&D activities in the areas of geoscience, safety assessment, and engineering technology development. Its four members are internationally recognized specialists in these areas, and meet to evaluate whether the work in each area is consistent with the current international state of knowledge and whether there is an adequate scientific, technical and resource basis to implement APM.

In September, the ITRG completed its fifth technical review, and in November, presented its findings to the NWMO's Board of Directors and Advisory Council. An overall finding of the review was that the scientific research undertaken by the NWMO has the broad scope necessary to support implementation of APM. The report also noted that the NWMO's technical work program continues to maintain a strong awareness of the latest developments in international repository science and technology as relevant to a Canadian context.

The NWMO reviewed, considered, and accepted the ITRG's recommendations, and prepared a response and action plan to address these. Both the ITRG 2012 Report and the NWMO's response and action plan have been posted on the NWMO website at www.nwmo.ca/itrg.

Involvement of the Canadian Nuclear Safety Commission

The NWMO continued to update the CNSC and seek feedback as part of its agreement to obtain CNSC review of conceptual designs and illustrative safety assessments for a used fuel repository in both crystalline and sedimentary rock formations. This work reflects the NWMO's commitment to seeking regulatory guidance and oversight early in the implementation of APM, the goal being to confirm that the NWMO would be able to meet the expectations of the CNSC Regulatory Guide G-320 on *Assessing the Long Term Safety of Radioactive Waste Management*. A safety case study was completed in 2012 and submitted to the CNSC for pre-project review. It may be viewed online at www.nwmo.ca/technicalresearch.

At the request of interested communities, CNSC staff provided independent briefings on the regulator's role in licensing an APM facility.

The CNSC, along with federal and provincial transportation agencies, also participated in a planning group to address the issues and concerns arising from the transportation of used fuel. This participation is an important part of confirming that the regulatory requirements and expectations associated with the transport of used fuel are consistently understood by all interested parties. Going forward, the NWMO will need to demonstrate to regulatory authorities the safety and security of a transportation system before shipments of used nuclear fuel can begin. In 2012, it took an important step toward that goal by beginning work on recertifying the used fuel transportation package to meet current regulatory requirements.

Internationally, the NWMO reports on its progress at meetings of the *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management* (*Joint Convention*). Reports to the *Joint Convention* are made under the auspices of the CNSC, and are part of the convention's requirement that Canada and other signatory nations demonstrate that they are meeting international commitments to manage radioactive waste and used nuclear fuel safely. The Fourth Review Meeting was held in May, and the Canadian delegation, lead by Peter Elder of the CNSC, included representatives from Natural Resources Canada, industry, and the NWMO. Canada was one of 63 countries participating in the *Joint Convention*.

On May 15, 2012, the Canadian delegation delivered a presentation on progress since the last Review Meeting and updates since the publication of its Fourth National Report to the Contracting Parties (other participating countries). NWMO staff provided an update on progress made toward the long-term management of Canada's used nuclear fuel since 2009 (the year of the most recent Convention). The discussions covered a broad range of topics, including used nuclear fuel inventory, facility costs, community dialogue and engagement activities, and the next steps in the site selection process. The peer review by the Contracting Parties noted that Canada has a solid plan to move forward on the long-term management of used nuclear fuel.

Quality Management

Two of the NWMO's fundamental values are Excellence and Transparency. As part of implementing these values, the NWMO has developed its management system to be compliant with internationally recognized standards and to have a third party acknowledge this compliance. In 2012, the organization received CSA Z1000:2006 Occupational Health and Safety Management and ISO 14001:2004 Environmental Management Systems certification. These two certifications are in addition to the ISO 9001:2008 certification, which the organization achieved in 2010. The three certifications demonstrate that the NWMO's management system is well integrated. Going forward, the NWMO will have to show continual improvement to maintain compliance with these standards. To ensure the organization stays the course, the NWMO will be audited on an annual basis.

Building and Sustaining a High-Performing Organization

STRATEGIC OBJECTIVE

The NWMO will build and sustain an effective organization with the social, environmental, technical and financial capabilities for the safe, long-term management of Canada's used nuclear fuel.

The NWMO's staffing priorities and policies reflect the fact that the management of used nuclear fuel is a long-term responsibility requiring expertise in a wide variety of areas. These include repository design and construction, environmental assessment, Aboriginal Traditional Knowledge, social research, ethics, law, finance, communications, and public engagement. All are critical to responding to the needs and concerns of interested and potentially affected communities, developing collaborative partnerships with those communities, and ensuring that evaluations of potential sites meet the highest technical standards, as does the eventual site itself.

In 2012, the NWMO continued to develop and grow its staffing and contractor capability through a variety of initiatives. These included the research partnerships and conferences described in *Optimizing Repository Designs and Further Increasing Confidence in Safety*, development of expertise among the third-party contractors conducting studies in interested communities, and succession planning.

At the same time, the important task of transferring information to future generations was furthered by 1) the youth engagement activities described in *Building Sustainable Relationships* and 2) the NWMO's ongoing support to graduate students through the Natural Sciences and Engineering Research Council's Industrial Postgraduate Scholarships Program.

Investments in business systems, most notably state-of-the-art technical and cost-estimating computer modelling, helped support the organization as it moved forward with the site selection process.

The NWMO 10 Years Later

In 2002, the *Nuclear Fuel Waste Act* was passed, and the NWMO got its start as the organization responsible for developing and implementing a long-term plan for safely and securely managing Canada's used nuclear fuel. Starting with just 12 employees, the NWMO now employs more than 130 people with skills in such diverse areas as engineering, geoscience, Aboriginal engagement, social research, transportation, finance, and communications.

Other Work

Ontario Power Generation's Deep Geologic Repository Project for Low and Intermediate Level Waste

Herpetologists conduct a targeted investigation of a sensitive reptile habitat near the Bruce nuclear site.

Ontario Power Generation (OPG) is proposing to construct and operate a deep geologic repository for the long-term management of low and intermediate level radioactive waste at the Bruce nuclear site in the Municipality of Kincardine. The project will hold waste currently in interim storage on the Bruce nuclear site in the Western Waste Management Facility, as well as the wastes that continue to be produced by the operation of nuclear generating stations at Bruce, Pickering and Darlington. Low level radioactive waste consists of industrial items that have become contaminated with low levels of radioactivity during routine cleanup and maintenance activities at nuclear generating stations. Intermediate level radioactive waste consists primarily of used nuclear reactor components, ion-exchange resins, and filters used to purify reactor systems. Used nuclear fuel will not be stored or managed in OPG's deep geologic repository.

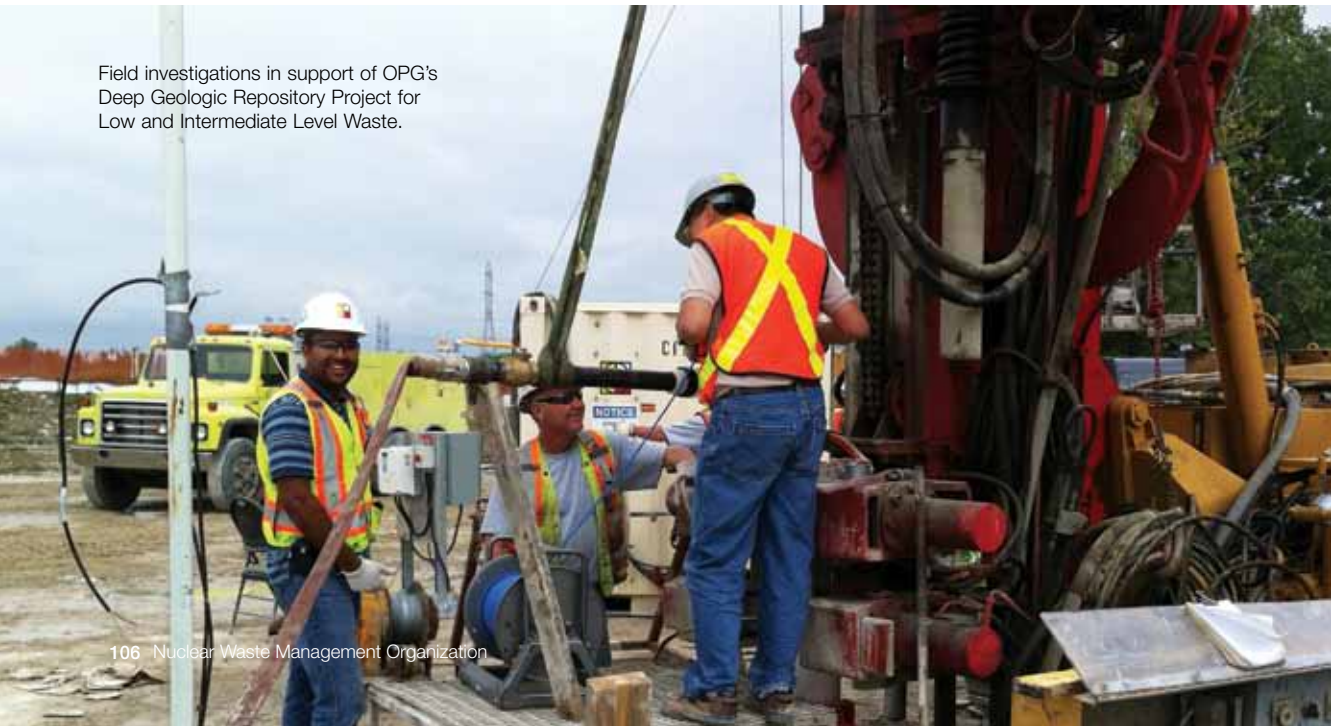
The NWMO is under contract to OPG to provide technical and other services for a deep geologic repository. The NWMO is currently providing design services and will provide construction services following the receipt of a licence for the repository.

The project took an important step forward in January 2012 with Environment Canada and the Canadian Nuclear Safety Commission establishing a three-member Joint Review Panel to review OPG's proposal to site and construct a facility for the long-term management of low and intermediate level radioactive waste at the Bruce nuclear site. The Panel's task is twofold: 1) to examine the environmental effects of the proposed project to see whether it can meet the requirements of the *2012 Canadian Environmental Assessment Act*; and 2) to obtain the information necessary for the consideration of the licence application under the *Nuclear Safety and Control Act* to prepare a site and to construct the deep geologic repository facility.

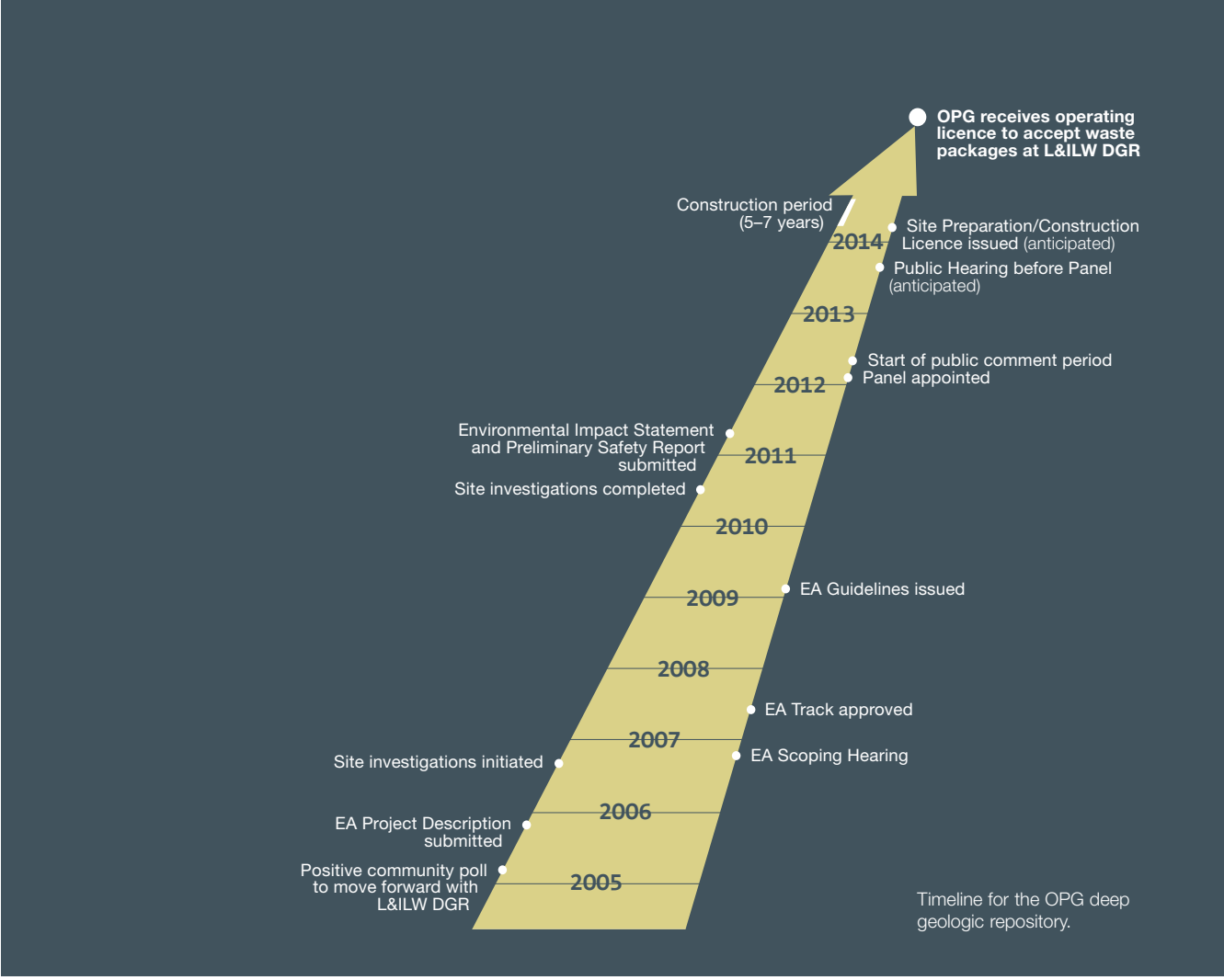
In February, the Panel announced a six-month public comment period, which was subsequently extended. The public comment period is an opportunity for the Panel, federal agencies, the public, and First Nations and Métis communities to review, assess, and comment on the adequacy of the Environmental Impact Statement and licensing documents in meeting the requirements of the guidelines issued for the project in January 2009. During the public comment period in 2012, NWMO staff were heavily involved in responding to the Panel's requests for additional information, and in planning for and presenting information at two technical information sessions called by the Panel – one on design and construction, the other on modelling.

Following the public review period, the Panel will schedule a public hearing for the project in the Municipality of Kincardine.

In 2012, the NWMO made progress on the detailed design of the proposed deep geologic repository and conducted site investigation activities in support of the design. Several design review



Field investigations in support of OPG's Deep Geologic Repository Project for Low and Intermediate Level Waste.



Timeline for the OPG deep geologic repository.

meetings were held with representatives from the design firms, mining and nuclear industry experts, conventional and radiological safety experts, and OPG staff. These meetings improved understanding of the design, incorporated recent experience, identified improvements and verified that all safety requirements were being implemented. The NWMO also conducted several quality reviews of its internal design processes and audited external contractor performance. At the same time, the NWMO gained acceptance of design turnover deliverables with OPG.

Fieldwork was completed in accordance with the NWMO's Health and Safety Management Plan and Environmental Management Plan for the project. The 2012 program included conducting a grouting verification program at the ventilation shaft to a depth of 200 metres and extending the shallow groundwater monitoring network with the installation of 10 new wells. All work was completed on time and on budget without a lost-time accident, injury or environmental reportable event.

Additional information about the Deep Geologic Repository Project is posted online at www.opg.com/dgr.

The Organization

The Members

The NWMO was established in 2002 by Canada's nuclear electricity generators, following passage by the federal government of the *Nuclear Fuel Waste Act*.

Ontario Power Generation, New Brunswick Power Corporation and Hydro-Québec are the founding Members, and along with Atomic Energy of Canada Limited, are required to fund the NWMO's operations.

Board of Directors

The Board of Directors is responsible for oversight of the organization and taking a leadership role in the development of the corporation's strategic direction.

As of December 31, 2012, the Board was composed of nine directors. Dr. Gary Kugler served as Chairman, and Mr. Ken Nash as President and CEO. Of the remaining seven directors, Ms. Josée Pilon was appointed by Hydro-Québec (HQ); Mr. Darren Murphy by the New Brunswick Power Corporation; and Mr. C. Ian Ross, Mr. Ron Jamieson, Dr. Deborah Poff, Mr. Pierre Charlebois, and Mr. Donn Hanbidge by Ontario Power Generation (OPG).

The Board of Directors convened four formal meetings in 2012. In addition, the four Committees of the Board met a total of 14 times during the year. Early in the year, the Board provided comment on the NWMO's 2011 Annual Report, and approved the audited financial statements which were subsequently presented to the NWMO Members at the Annual General Meeting held on June 14. The Directors also reviewed and approved the NWMO's Performance Objectives and Measures

for 2013. In fall 2012, the 2013–2017 NWMO Business Plan was presented to the Board for discussion and approval. The Board held several discussions related to strategic decisions and the future direction of the NWMO.

Other activities by the Board of Directors included:

- Ongoing review and discussion of the NWMO's activities related to the Adaptive Phased Management (APM) site selection process, with detailed discussions about the timelines for suspending the expressions of interest phase, and briefings on the communities expressing an interest in learning more about the project;
- Ongoing review of the NWMO's business risks and strategic Board decisions;
- Development of occupational health and safety policies and procedures in preparation for fieldwork;
- A review of the ongoing implementation of service agreements with OPG related to the work on OPG's Deep Geologic Repository Project for Low and Intermediate Level Waste;
- A review of the annual report prepared by the Independent Technical Review Group (ITRG);
- Discussions about the redevelopment of the Elders Forum and ongoing updates on the Council of Elders;
- Discussions about the transition to be made under the new *Canada Not-for-profit Corporations Act*;
- Briefings on and discussions about transportation planning; and
- Reviews of benchmarking information used by nuclear waste management organizations in other countries.

Committees of the Board of Directors

Audit, Finance and Risk Committee

The committee met four times in 2012. The committee provides oversight of external audits of the NWMO's financial statements. The committee also advises the Board annually on the selection of auditors for the following year and the terms of the Audit Service Plan. Meetings are held with the auditors each year to discuss their findings.

The committee also regularly reviewed in-year financial statements and reported its findings to the Board at large. The committee reviews the NWMO's audited pension and financial statements and recommends approval. The committee's other activities included reviews of:

- The NWMO's business plan;
- Business risk;
- Expenses reported by the Chairman, the President and the organization's top five executives;
- The NWMO's financial position reports;
- The organization's performance objectives and measures;
- The NWMO's financial policies;
- The NWMO's organizational authority registers;
- Pension plan performance and related developments;
- The APM engagement audit plan;
- Work in the Lifecycle Liability Management area;
- The committee's charter; and
- The *Nuclear Fuel Waste Act* trust fund contributions.

In June, a joint meeting of the Audit, Finance and Risk Committee, and the Human Resources and Compensation Committee was held to review the NWMO's pension plan funding and sustainability.

As of December 31, 2012, there were four directors on the Audit, Finance and Risk Committee:

- Ian Ross, Chair;
- Ron Jamieson;
- Josée Pilon; and
- Donn Hanbidge.

Siting Committee

The NWMO Siting Committee provides a vehicle through which the Board may maintain close oversight of this important element of the NWMO's mandate and manage the risks associated with the execution of the site selection process. The committee met four times in 2012. Its activities included:

- A review of the activities underway in communities engaged in the site selection process;
- A review of the timing and communication of the suspension of the expressions of interest phase of the site selection process;
- Discussion of the preliminary community assessments in Step 3 of the site selection process, plus advanced planning for the fieldwork phase;
- Ongoing updates about the external environment in which the site selection process is unfolding, plus the relationship-building work the NWMO has engaged in to ensure that the choice to host the site is made by an informed and willing community;
- Discussions about ensuring well-being for the community hosting a repository;
- A review of the accommodation of Aboriginal peoples in the site selection process;
- A review of the processes for acquiring Crown lands;
- Continuing a review of plans to redevelop the Elders Forum and reports on the new Council of Elders;
- A review of the performance objectives and measures for the 2013 siting program;
- A review of the Siting Committee charter; and
- Preparations for the next steps in the siting process.

As of December 31, 2012, there were four directors on the Siting Committee:

- Ron Jamieson, Chair;
- Deborah Poff;
- Darren Murphy; and
- Pierre Charlebois.

Human Resources and Compensation Committee

The committee met four times in 2012. It is responsible for overseeing the NWMO's human resources functions, including compensation practices, human resources policy, organization design, labour relations and the pension plan.

As of December 31, 2012, the committee had four directors:

- Ian Ross, Chair;
- Pierre Charlebois;
- Josée Pilon; and
- Deborah Poff.

Low and Intermediate Level Waste (L&ILW) Deep Geologic Repository Oversight Committee

The L&ILW Deep Geologic Repository Oversight Committee has leadership responsibility for monitoring the NWMO's role in managing the regulatory approvals, engineering, procurement and construction of OPG's Deep Geologic Repository Project in Kincardine, Ontario. This includes review of the NWMO's performance under its Deep Geologic Repository Services Agreement, and Engineering, Procurement and Construction Management Agreement with OPG, as well as risk management related to the project. The committee met twice in 2012, in addition to touring Lake Shore Gold's Timmins West mine (Ontario), and the IAMGOLD's Westwood mine near Rouyn-Noranda (Quebec). The two projects provided the opportunity for committee members to observe features similar to those proposed for the OPG L&ILW Deep Geologic Repository Project at a recently completed shaft-sinking project in operation and a shaft under development.

The committee's other activities included:

- Progress updates on the regulatory review and detailed design phases of work;
- Risk reviews;
- Discussions about contracting plans;
- Review of occupational health and safety policy, procedures and performance;
- Review of performance objectives for the L&ILW deep geologic repository work; and
- Review of the committee's charter.

As of December 31, 2012, the committee had six members:

- Gary Kugler, Chair;
- Ian Ross;
- Donn Hanbidge;
- Albert Sweetnam (non-director committee member);
- Morris Medd (non-director committee member); and
- Wolf Seidler (non-director committee member).

Members of the Board of Directors


Gary Kugler


Ken Nash


Ron Jamieson


Darren Murphy


Deborah Poff


Ian Ross

Pierre Charlebois

Donn Hanbidge

Josée Pilon

As of December 31, 2012, the Board was composed of nine directors. Dr. Gary Kugler served as Chairman, and Mr. Ken Nash as President and CEO. Of the remaining seven directors, Ms. Josée Pilon was appointed by HQ; Mr. Darren Murphy by the New Brunswick Power Corporation; and Mr. C. Ian Ross, Mr. Ron Jamieson, Dr. Deborah Poff, Mr. Pierre Charlebois, and Mr. Donn Hanbidge by OPG.

Gary Kugler – Chair
Dr. Gary Kugler is the retired Senior Vice-President of Nuclear Products and Services at Atomic Energy of Canada Limited (AECL), where he was responsible for AECL's commercial operations. During his 34 years with AECL, he held various technical, project management, business development and executive positions. Prior to joining AECL, he served as a pilot in the Canadian Air Force. Dr. Kugler is a graduate of the Institute of Corporate Directors' Director Education Program and also serves on the Board of OPG. He holds an Honours B.Sc. in Physics and a Ph.D. in Nuclear Physics from McMaster University.

Ken Nash – President and CEO of the NWMO
Mr. Ken Nash is a founding director of the NWMO and the immediate past chair of the organization's Board of Directors. He has held a number of senior management positions at Ontario Hydro and OPG in the areas of finance, engineering and environmental management, and most recently was Senior Vice-President of the Nuclear Waste Management Division. He is also past chair of EDRAM, an association of waste management organizations from 10 countries, including Canada.

Pierre Charlebois
Mr. Pierre Charlebois is the retired Executive Vice-President and Chief Operating Officer at OPG and was responsible for the operation of OPG's nuclear, hydro and fossil businesses. From December 2003 to November 2006, Mr. Charlebois served as Chief Nuclear Officer, responsible for overseeing OPG's nuclear generation business and its performance. Mr. Charlebois graduated from Ottawa University in 1975 with a bachelor's degree in Applied Science. He is a member of the Professional Engineers of Ontario.

Donn Hanbidge
Mr. Donn Hanbidge is the Chief Financial Officer at OPG. He was appointed to his current position in 2005 and is responsible for providing financial leadership and operational support to OPG's business units and support services. He has overall accountability for the controllership function, internal audit, accounting, reporting, taxation, business and investment planning, treasury, pension and nuclear fund management, and financial communications. Prior to joining OPG, Mr. Hanbidge held various financial management roles with Union Gas Limited. He began his career at Ernst & Young. Mr. Hanbidge obtained an Honours Bachelor of Arts in Business Administration from the Richard Ivey School of Business at the University of Western Ontario and is a Chartered Accountant.

Ronald (Ron) L. Jamieson
Mr. Ron Jamieson is a member of the Board of Directors of the Ontario Power Authority. Prior to his retirement in late 2005, he served as Senior Vice-President of Aboriginal Banking at BMO Financial Group. Mr. Jamieson has held several senior executive positions in the financial services industry. Throughout his career, he has also been active in economic development initiatives for Aboriginal communities across Canada. Mr. Jamieson also served as Chairman, President and CEO of Ontario Energy Corporation, whose mandate was to invest or participate in energy projects throughout Canada. He is also Chairman of the Canadian Council for Aboriginal Business and was recently named President of First Canadian Property Investments Ltd.

Darren Murphy
In June 2012, Mr. Darren Murphy was appointed Vice-President of Corporate Services and Chief Financial Officer at NB Power. His areas of responsibility include finance, human resources, information systems, voice services, environment and regulatory affairs. Mr. Murphy joined NB Power's executive team in 2007, and in addition to his current role, he has held a number of executive positions, including Vice-President of Distribution and Customer Service, and Vice-President of Transmission. He had worked for over 17 years in Distribution field operations before joining the executive team. Mr. Murphy is a member of the Board of Directors for the New Brunswick Investment Management Corporation.

Josée Pilon
Ms. Josée Pilon is an MBA graduate of Laval University. She is member of the steering committee on the evaluation project for the rehabilitation of Gentilly-2. As a special projects manager, she is responsible for evaluating business opportunities for new sources of energy from the private sector, including wind power, biomass and hydroelectric. She is also involved on the financial impact evaluation of new hydroelectric projects on municipalities. Prior to her current position, she held numerous business development positions in international projects.

Deborah C. Poff
Dr. Deborah Poff holds the position of President and Vice-Chancellor at Brandon University in Manitoba. Previously, Dr. Poff was a Professor of Philosophy and Political Science at the University of Northern British Columbia (UNBC). From 1994 to 2004, she was Vice-President and Provost at UNBC. In 2004, she was awarded a Fellowship in Public Policy with the Sheldon Chumir Foundation in Ethical Leadership. She is the co-founder and editor of the *Journal of Business Ethics*, and editor-in-chief of the *Journal of Academic Ethics*. She is the editor of *Business Ethics in Canada*, and the section editor on business and economic ethics of *Encyclopedia of Applied Ethics*, published by Elsevier in 2012. She recently co-edited *Citation Classics from the Journal of Business Ethics: Celebrating the First Thirty Years of Publication* with Springer.

C. Ian Ross
Mr. Ian Ross served at the Richard Ivey School of Business at the University of Western Ontario from 1997 to 2003. Most recently, he was Senior Director, Administration in the Dean's Office, and was also Executive in Residence for the School's Institute for Entrepreneurship, Innovation and Growth. He has served as Governor, President and CEO of Ortech Corporation; Chairman, President and CEO of Provincial Papers Inc.; and President and CEO of Paperboard Industries Corp. Mr. Ross currently serves as a director for a number of corporations, including OPG, and is Chair of GrowthWorks Canadian Fund Ltd. He is also a member of the Law Society of Upper Canada.

Officers

Chairman of the Board

Dr. Gary Kugler

President and CEO

Kenneth E. Nash

Vice-Presidents

Angelo Castellan	Environmental Assessment and Corporate Support
Michael Hung	Treasurer and Chief Financial Officer
Frank King	Chief Engineer
Patrick Moran	General Counsel and Corporate Secretary
Sean O'Dwyer	Human Resources
Kathryn Shaver	APM Engagement and Site Selection
Derek Wilson	Design and Construction

Executive Committee

Kenneth E. Nash	President and CEO
Angelo Castellan	Environmental Assessment and Corporate Support
Chris Hatton	APM Repository Design Development
Michael Hung	Treasurer and Chief Financial Officer
Frank King	Chief Engineer
Patrick Moran	General Counsel and Corporate Secretary
Sean O'Dwyer	Human Resources
Sean Russell	APM Repository Research and Development
Kathryn Shaver	APM Engagement and Site Selection
Derek Wilson	Design and Construction

The NWMO Team

As of December 31, 2012, the NWMO had 134 full-time staff.

Head Office
22 St. Clair Avenue East, 6th Floor
Toronto, Ontario M4T 2S3
Canada


WHAT WE DO
NOS TRAVAUX
MISSION
MISSION

Advisory Council

As required by the *Nuclear Fuel Waste Act* (*NFWA*), the NWMO Board of Directors established an Advisory Council in 2002. In 2012, the Advisory Council comprised 10 members. The Honourable David Crombie continued to serve as Chair. The full Advisory Council membership is profiled on pages 134 to 137.

Statutory Reporting Requirements

The Advisory Council is required by the *NFWA* to comment every three years on the previous three years of NWMO activity. These independent statements, which include observations on the results of NWMO public consultations and analysis of any significant socio-economic impacts of the organization's activities, are published in the NWMO's triennial reports. The Council is also required to comment on the organization's five-year strategic plans and budget forecasts. Advisory Council comments are submitted to the Minister of Natural Resources and made public at the same time.

Ongoing Advice to the NWMO

In addition to fulfilling its legislated reporting requirements, the Advisory Council outlines its activities on a yearly basis for inclusion in the NWMO Annual Report. The Council meets regularly with the NWMO senior management, closely following the development of the organization's plans and activities, and providing ongoing counsel and advice. At any time, the Council may choose to deliberate in camera.

At the Advisory Council's request, formal minutes of its meetings are recorded and posted on the NWMO website at www.nwmo.ca/advisorycouncilminutes. The NWMO's dispositioning of that advice may be reviewed at www.nwmo.ca/actrackingmatrices.

The Advisory Council Chair has direct access to NWMO Board meetings to ensure a comprehensive exchange of information and to provide a conduit for the Chair to keep the Council fully informed on Board matters, and vice versa.

Advisory Council Membership

Current appointments to the Advisory Council are for three years each, and are based on several criteria: the type of work the NWMO will be engaged in over the next four years, the expertise that work will require, and the specific provisions of the *NFWA*.

In 2012, one new member was appointed: Dr. Wesley Cragg. An internationally recognized expert in applied ethics, Dr. Cragg's appointment reflects the importance the NWMO attaches to the framework of ethical values to which it is committed, and the central role these values play in all aspects of strategic planning, operations and the enhancement of community well-being as the site selection process moves forward.

Highlights of the Council's Activities in 2012

The Advisory Council met four times in person in 2012 and once by conference call. At each meeting, NWMO staff briefed the Council on the progress of current projects, as well as on the status of plans under development. Members reviewed and offered advice on the NWMO's draft 2013–2017 Business Plan. Topics of particular interest to Council members were also deliberated, and requests for additional information were met by NWMO staff.

All key plans were brought forward to the Council for discussion and guidance before decisions were taken. Many of the discussions in 2012 focused on the site selection process and the communities engaged in that process. Outside regular meetings, several members attended the meetings of the new Council of Elders. Advisory Council members also participated in a meeting of the Adaptive Phased Management Geoscientific Review Group (APM-GRG) and in the fourth International Conference on Geological Repositories (ICGR).

Site Selection Process

Throughout the year, the Council discussed and offered direction on key aspects of the site selection process. At each meeting, members were provided with updates on the NWMO's work and engagement in interested communities, and were asked to provide advice on the NWMO's draft plans and communications in support of key decisions in the site selection process.

An important milestone brought forward for Council advice was the timing of, and approach to, suspending the expressions-of-interest phase of the community-driven site selection process. Early in 2012, the NWMO sought counsel from members on the timing of this decision and the suite of materials that would be needed to communicate it. The Council supported suspending new expressions of interest at the end of September 2012, and advised on the scope and content of the communications material required to support that announcement well in advance of the deadline. Further to the Council's advice, additional materials were developed to support the suspension of new expressions of interest.

The approach to preliminary assessments for Step 3 communities was an important focus for the Council in 2012. There was an in-depth presentation and Council discussion of individual components of the preliminary assessments, most notably, geosciences, environment and safety, engineering, transportation, and community well-being. At the Council's

request, a meeting was devoted to a detailed discussion of the process of preliminary assessments and interim work to date. Members also discussed the framework in which the assessments are being conducted and how findings would be integrated. The Council sought clarification on the NWMO's proposed approach to integrating and evaluating findings from different streams of technical and social aspects of the assessments as the organization begins the process of narrowing down potential host communities. The Council had a preliminary discussion on future reporting out of assessment findings and on the importance of communicating findings in a traceable and consistent format.

The Council said that it was important that the NWMO's partners – communities and contractors – share the organization's values. As well, the Council emphasized the importance of having interested communities play an active role in engaging surrounding areas, interweaving Aboriginal Traditional Knowledge and the NWMO's work, addressing transportation issues, and engaging Aboriginal peoples. Members emphasized the importance of continued capacity building with communities and potentially affected Aboriginal peoples in siting regions, and the importance of ensuring that engagement with surrounding communities is guided by the framework of ethical values on which the site selection process is grounded.

Project management was another topic the Council addressed throughout the year. Members requested a discussion on how the site selection process would be resourced and overseen, along with the respective roles of NWMO staff and contracted specialists. Members regularly reviewed with the NWMO the need for ensuring sufficient resources and staffing to conduct preliminary assessments in multiple locations in Canada. The Council also discussed the NWMO's draft plans for the field investigations to be conducted in future phases of the site selection process.

Third-Party Advice and Reviews

Third-party advice and reviews figured prominently in the Council's discussions about ensuring that the site selection process is thorough, incorporates the best available knowledge, and uses this knowledge in reviewing and confirming site assessments. The Council requested briefings on the subject matter experts contracted by the NWMO to support the delivery of Phase 1 preliminary assessments. The NWMO was also encouraged to forge partnerships with companies that can assist in integrating Aboriginal Traditional Knowledge into the assessments.

The Advisory Council supported the NWMO's establishment of a new APM-GRG to advise on preliminary assessments of the geologic suitability of potential sites. Members explored whether the NWMO's Independent Technical Review Group (ITRG) should also have a role in reviewing preliminary assessments, and through discussion with management, the Council agreed that this role was already being fulfilled by the APM-GRG.

Council of Elders and Aboriginal Engagement

The Advisory Council was consulted on the establishment of the new Council of Elders. Advisory Council members reviewed and provided refinements to the new terms of reference and various aspects of the structure of the Council of Elders. The Members' recommendations included greater involvement for youth and women, greater clarity on its mission and advisory role, and options for structuring the terms of male and female co-chairs. The Advisory Council emphasized the importance of retaining Traditional Knowledge and spiritual components in the new Council of Elders. The Advisory Council agreed that the Council of Elders should function as advocates of sharing information, learning, and dialogue on APM, and not as proponents of the project.

Throughout the year, the NWMO invited Advisory Council members to advise on the organization's Aboriginal engagement program. Members sought regular updates on the extent of dialogue underway with local Aboriginal communities and proposed outreach to a range of respected leaders in the community, so as to enhance opportunities for learning and conversation. They emphasized that strong candidate host communities will demonstrate their commitment to reaching out locally, actively involving Aboriginal groups and neighbours, and providing for Aboriginal participation on community liaison committees. Council members also provided suggestions on a number of organizations the NWMO might want to work with to further Aboriginal engagement activities and capacity building. Members emphasized that the NWMO should continue to engage Elders and leaders to learn from traditional teachings and respect the spirituality embodied in Aboriginal Traditional Knowledge.

Technical Aspects of Adaptive Phased Management

The Council continued to be briefed on the progress of the NWMO's APM technical program. This included briefings on the NWMO's ongoing work program in transportation and repository design.

The Council discussed the used fuel container sizing study and other aspects of repository design under development at the NWMO. Members explored with management how the NWMO's work on behalf of Ontario Power Generation's (OPG) low and intermediate level waste repository may offer relevant experience for future stages in the APM program.

The Council continued to explore the transportation of used fuel. Members reviewed with the NWMO different possible modes of transportation, international experience in transporting used fuel, and work underway on the APM transportation system. Further to the Council's request, NWMO management reviewed how transportation will be addressed in the preliminary assessments being conducted during Step 3 of the site selection process, and more broadly as part of implementing APM.

The Council offered suggestions on how to support discussions of transportation with communities. Members provided feedback on a first draft of *Safe and Secure Transportation of Canada's Used Nuclear Fuel*, and made several recommendations for its refinement. Members also urged the NWMO to develop videos to demonstrate container robustness and safety, including the various tests of container strength.

Early in the year, the Council reviewed the NWMO's dispositioning of the 2011 recommendations of the ITRG. In November, the Chair of the ITRG presented the group's annual report for 2012 to the Council.

Engagement and the Evolving External Landscape

As requested by the Council, each meeting began with a review of the changing external landscape, both in Canada and abroad. As part of this regular review, the Council took stock of national and international developments that might pose risks to the NWMO's work, and considered how those risks might best be managed.

Each meeting also included a detailed review of the NWMO's engagement program. Among the activities routinely discussed were the NWMO's engagement activities with Aboriginal organizations, municipal associations, different levels of government, interested organizations, the media, and youth. Discussions with the NWMO's Municipal Forum were also reviewed, as were plans for new engagement activities.

The Council continued to be briefed about the NWMO's work on the OPG's Deep Geologic Repository Project for Low and Intermediate Level Waste. Members were regularly updated on the regulatory approvals phase of work now underway with the Joint Review Panel. This work, which includes an environmental assessment, will provide invaluable experience for the NWMO as it moves forward in implementing APM. The Council was also updated throughout the year on the NWMO's work in advancing designs and engineering for the OPG repository.

The Council continued to track international developments. Several Council members attended the ICGR (hosted by the NWMO in fall 2012), and found this to be a very productive and important exchange for learning how other countries are going about developing their own repositories. Members were pleased that the NWMO provided opportunities for participation in the conference by representatives from interested communities, Aboriginal organizations and the NWMO's Municipal Forum. To further enhance learning from other countries, Members urged the NWMO to continue to study the experience of the Waste Isolation Pilot Plant in Carlsbad, New Mexico, citing it as an example of a repository project that enjoys ongoing support by the host community.

Council members contributed to the NWMO's review of lessons learned from the 2011 earthquake in Japan. In particular, Members identified opportunities to distinguish more clearly between the risks posed by a nuclear power plant and those posed by a deep geological repository. The Council also identified an opportunity to communicate the management approach and values that distinguish the NWMO.

The Council also discussed the NWMO's review of academic social research in the field of radioactive waste management.

Communications

Members suggested that the NWMO explore opportunities to more broadly communicate what they felt was the organization's innovative approach to public policy development, engagement and work with communities. They cited favourable mentions of the NWMO's work in the United States Blue Ribbon Commission on America's Nuclear Future. In response to this advice, the NWMO suggested that the Commission's lead advisor consider expressing his observations in an op-ed piece. He agreed, and this article was shared with Canadian media outlets. More broadly, the Council urged management to consider communications opportunities to capture the NWMO's management approach and values. As well, the Council continued to review and provide comment on the NWMO's draft annual reports to ensure comprehensive and clear reporting on activities.

Members of the Advisory Council

Frederick Gilbert | Wesley Cragg | Marlyn Cook | David Cameron | Dougal McCreath

The Advisory Council is required by the *NFWA* to comment every three years on the previous three years of NWMO activity. These independent statements, which include observations on the results of NWMO public consultations and analysis of any significant socio-economic impacts of the organization's activities, are published in the NWMO's triennial reports. The Council is also required to comment on the organization's five-year strategic plans and budget forecasts. Advisory Council comments are submitted to the Minister of Natural Resources and made public at the same time.

Derek Lister | Eva Ligeti | Michel Rhéaume | David Crombie

David Crombie – Chair
The Honourable David Crombie is the President of David Crombie and Associates, the Chair of Toronto Lands Corporation, and past Chair of Ontario Place. He is the immediate past President and CEO of the Canadian Urban Institute. He is also a past mayor of the City of Toronto and a Privy Councillor. Mr. Crombie was the first Chancellor of Ryerson University and is the recipient of honorary doctorates of law from the University of Toronto and the University of Waterloo. Mr. Crombie is an Officer of the Order of Canada and of the Order of Ontario.

David R. Cameron
Dr. David Cameron, a Fellow of the Royal Society of Canada, is a Professor of Political Science at the University of Toronto. His professional career has been divided between public service – in Ottawa and at Queen's Park, Ontario – and academic life. A long-time student of Canadian federalism and Quebec nationalism, he has turned his attention to constitution-making and government design in conflict and post-conflict situations in Sri Lanka, Iraq, Somalia, the Western Sahara and Jerusalem. He is currently a Senior Fellow at the Transatlantic Academy in Washington, D.C.

Marlyn Cook
Dr. Marlyn Cook is presently working in the community of Pikangikum in northwestern Ontario. She was the Chief of Staff and Director of the Traditional Healing Program with Weeneebayko General Hospital in Moose Factory, Ontario. Dr. Cook is Cree and a member of the Grand Rapids First Nation in northern Manitoba. She has practised medicine in the Mohawk community of Akwesasne, in Sioux Lookout Zone and in a number of northern Aboriginal communities in Manitoba. She is active in her community, serving as an advisor and Board member to a number of organizations. Dr. Cook is known for her work blending Western and Traditional medicine, and has been involved with sharing this knowledge with medical students and doctors throughout Canada. Her belief is that healing needs to be focused on all aspects of the person – spiritual, mental, physical and emotional.

Wesley Cragg
Dr. Wesley Cragg is a graduate of the Universities of Alberta (BA Hon. and MA) and Oxford (B.Phil. and D.Phil.) which he attended as a Rhodes Scholar. He was appointed the first George R. Gardiner Professor of Business Ethics at York University's Schulich School of Business (1992 to 2006), where he launched Schulich's MBA Program in Business Ethics. In addition to business ethics, his research interests include professional ethics; moral, social, political and legal theory; the ethics of resource extraction; socially responsible investment; and environmental ethics. He was the Founding Chair and President of Transparency International Canada (1996 to 2006), and is a former President of the John Howard Society of Canada, a former President of the Canadian Philosophy Association, and a long-time member of the Boards of the John Howard Society of Sudbury, Ontario and Canada. In 2008, Dr. Cragg was awarded a Social Science and Humanities Research Council Grant to develop the Canadian Business Ethics Research Network.

Frederick Gilbert
Dr. Frederick Gilbert is the past President and Vice-Chancellor of Lakehead University in Thunder Bay, Ontario. Dr. Gilbert has had an extensive teaching, research and administrative career in the United States and Canada at Lakehead University, Colorado State University, the University of Northern British Columbia, Washington State University, the University of Guelph and the University of Maine, and also has held several environmental and wildlife management public service appointments and positions. He has retired to Nova Scotia, where he is starting an organic farming operation.

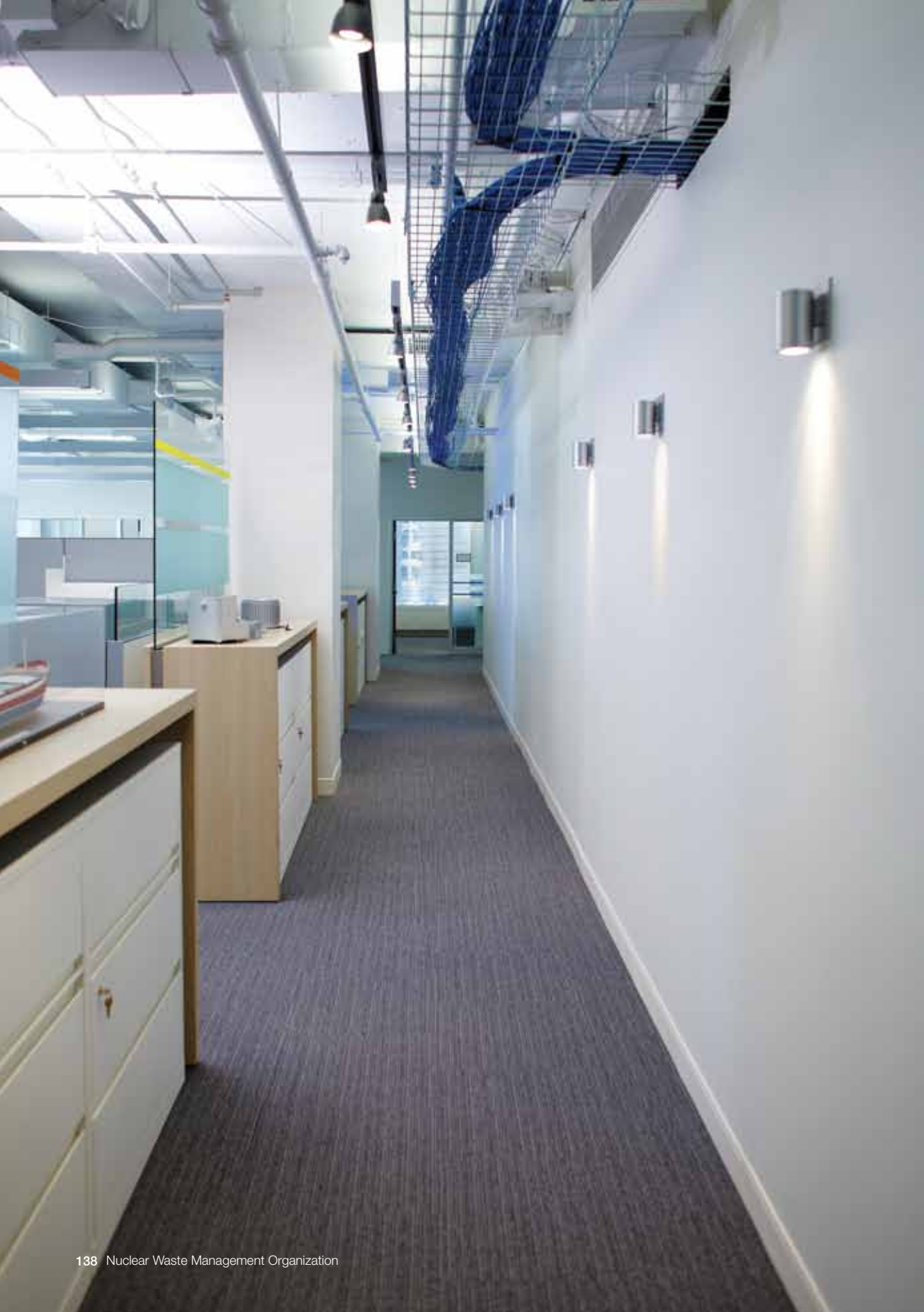
Eva Ligeti
Ms. Eva Ligeti teaches Environmental Law and Policy in the graduate program in Environmental Science at the University of Toronto. As the Executive Director of the Clean Air Partnership, she worked to make Toronto more environmentally sustainable and a world leader in clean air. A lawyer, she served as Ontario's first Environmental Commissioner from 1994 to 1999. Ms. Ligeti has served on numerous boards and committees including the Council of the Federation of Canadian Municipalities' Green Municipal Fund, as a member of the Province of Ontario's Expert Panel on Climate Change Adaptation, and as a co-chair of the Greening Greater Toronto Task Force.

Derek Lister
Dr. Derek Lister is Professor Emeritus in the Chemical Engineering Department at the University of New Brunswick in Fredericton, where he also holds the Research Chair in Nuclear Engineering. His main research interests are in chemistry and corrosion associated with nuclear and other power systems, areas in which he has published widely. He holds positions on a number of national and international committees advising government and industry.

Dougal McCreath
Dr. Dougal McCreath is Professor Emeritus in the School of Engineering at Laurentian University in Sudbury, Ontario. A Fellow of the Engineering Institute of Canada, he has wide teaching, research and international consulting interests, ranging from the design of deep underground excavations to the recovery and sustainability of damaged ecosystems. He has served on two Canadian Environmental Assessment Agency review panels dealing with nuclear related issues.

Donald Obonsawin
Mr. Donald Obonsawin is the founder and President of DIRECTIONS, a management consulting company that provides policy, management and strategic planning services. From 2003 to 2007, he was President and CEO of Jonview Canada Inc. Previous to that, he enjoyed a 25-year career in both the provincial and federal public services, including 15 years as Deputy Minister of seven Ontario government ministries. He also held senior positions with the federal departments of Indian Affairs and Northern Development Canada, and Health and Welfare Canada. Mr. Obonsawin is a member of the Abenaki First Nation of Odanak, and his honours include being awarded with the Queen's Diamond Jubilee Medal in 2012.

Michel R. Rhéaume
Mr. Michel Rhéaume is the CEO of RHEM Technologies Inc. in Grand-Mère, Quebec, a company specializing in health physics. Mr. Rhéaume is a physics graduate from Université du Québec à Trois-Rivières. He began his career at Hydro-Québec in 1975, and before his retirement, had been a manager in Health Physics, Emergency Preparedness, Environment, Nuclear Safety and Licensing, and Nuclear Waste Management. Mr. Rhéaume also taught nuclear physics and health physics for 20 years at Université du Québec à Trois-Rivières.



Auditor's Report and Financial Statements

Management's Responsibility for Financial Reporting

The accompanying financial statements of the Nuclear Waste Management Organization (NWMO) and all the information in this annual report are the responsibility of management and have been approved by the Board of Directors.

The financial statements have been prepared by management in accordance with Canadian generally accepted accounting principles. When alternative accounting methods exist, management has chosen those it deems most appropriate in the circumstances. Financial statements are not precise since they include certain amounts based on estimates and judgments, particularly when transactions affecting the current accounting period cannot be finalized until future periods.

Management has determined such amounts on a reasonable basis in order to ensure that the financial statements are presented fairly, in all material respects, and in light of information available up to February 28, 2013.

Management has a system of internal controls designed to provide reasonable assurance that the financial statements are accurate and complete in all material respects. The internal control system includes an established business conduct policy that applies to all employees. Management believes that the systems provide reasonable assurance that transactions are properly authorized and recorded, financial information is relevant, reliable and accurate, and the Organization's assets are appropriately accounted for and adequately safeguarded.

The Board of Directors is responsible for ensuring management fulfils its responsibilities for financial reporting, and is ultimately responsible for reviewing and approving the financial statements. The Board carries out this responsibility through its Audit, Finance and Risk Committee (the Committee).

The Committee is appointed by the Board and meets periodically with management, as well as the external auditor, to discuss internal controls over the financial reporting process, auditing matters and financial reporting issues; to satisfy itself that each party is properly discharging its responsibilities; and to review the financial statements and the external auditor's report. The Committee reports its findings to the Board for consideration when approving the financial statements for issuance to the members. The Committee also considers, for review by the Board and approval by the members, the engagement or reappointment of the external auditor.

The financial statements have been audited by Deloitte LLP, the independent external auditor, in accordance with Canadian generally accepted auditing standards on behalf of the members.

February 28, 2013

K. E. Nash

Ken Nash
President and CEO

Michael Hung
Chief Financial Officer

Independent Auditor's Report

To the Members of the Nuclear Waste Management Organization

We have audited the accompanying financial statements of Nuclear Waste Management Organization, which comprise the statements of financial position as at December 31, 2012, December 31, 2011, and January 1, 2011, and the statements of operations and changes in net assets and of cash flows for the years ended December 31, 2012, and December 31, 2011, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian accounting standards for not-for-profit organizations, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with Canadian generally accepted auditing standards. Those standards require that we comply with ethical requirements and plan and perform the audits to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained in our audits is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements present fairly, in all material respects, the financial position of Nuclear Waste Management Organization as at December 31, 2012, December 31, 2011, and January 1, 2011, and the results of its operations and its cash flows for the years ended December 31, 2012, and December 31, 2011, in accordance with Canadian accounting standards for not-for-profit organizations.

Deloitte LLP

Chartered Professional Accountants, Chartered Accountants
Licensed Public Accountants
February 28, 2013
Toronto, Ontario

Statement of financial position
as at December 31, 2012, December 31, 2011, and January 1, 2011

	December 31, 2012	December 31, 2011	January 1, 2011 (Note 2)
	$	$	$
Assets			
Current assets			
Cash (Note 4)	4,976,999	9,936,140	2,565,656
Accounts receivable (Note 6)	2,216	105,880	3,712
Member contributions receivable (Note 7a)	3,821,793	-	5,212,039
Prepaid expenses and deposits	677,433	368,900	428,336
	9,478,441	10,410,920	8,209,743
Capital assets (Note 5)	3,149,378	3,250,408	2,865,405
Deferred pension asset (Note 9)	13,362,177	10,846,532	9,321,260
	25,989,996	24,507,860	20,396,408
Liabilities			
Current liabilities			
Accounts payable and accrued liabilities (Note 14)	8,774,271	9,798,716	7,808,494
Deferred lease inducements (Note 10)	196,229	261,861	182,327
Deferred member contributions (Note 7b)	601,941	420,343	273,922
	9,572,441	10,480,920	8,264,743
Deferred capital contribution (Note 8)	3,149,378	3,250,408	2,865,405
Long-term deferred member contributions (Note 7c)	4,968,770	3,755,620	3,325,648
Other post-employment and pension benefits liability (Note 9)	8,299,407	7,020,912	5,940,612
	16,417,555	14,026,940	12,131,665
Net assets	-	-	-
	25,989,996	24,507,860	20,396,408

Approved by the Board of Directors, February 28, 2013.

K. E. Nash

Ken Nash
President and CEO
Toronto, Canada

C. Ian Ross
Chair – Audit, Finance and Risk Committee
Toronto, Canada

Statement of operations and changes in net assets
year ended December 31, 2012 and 2011

	2012	2011
	$	$
Revenue		
Member cash contributions received (Note 6)	60,906,493	64,956,375
Non-member cash contributions received	400,793	317,020
	61,307,286	65,273,395
Change in deferred capital contributions (Note 8)	101,030	(385,003)
Change in long-term deferred member contributions (Note 7c)	(1,213,150)	(429,972)
Change in member contributions receivable and deferred member contributions (Note 7a and 7b)	3,640,195	(5,358,460)
Total contribution revenue (Note 13)	63,835,361	59,099,960
Interest income (Note 13)	50,269	28,120
Total revenue	63,885,630	59,128,080
Expenses		
Adaptive Phase Management		
Staffing and administration (Note 6)	17,055,421	13,904,093
Siting process	7,119,676	2,235,851
Design and development safety case	9,256,369	7,565,204
Building relationships	2,306,274	2,957,749
Governance structure	514,296	580,634
Adapting to change	377,507	186,412
Funding formula/financial surety	-	29,992
	36,629,543	27,459,935
Deep Geologic Repository		
Regulatory review stage	7,632,470	4,563,631
Design stage	9,888,536	16,155,941
Staffing and administration	7,477,553	8,075,093
	24,998,559	28,794,665
Life Cycle and Liability Management		
Contract services	180,843	408,952
Staffing and administration	1,179,734	1,463,727
	1,360,577	1,872,679
Amortization	896,951	1,000,801
Total expenses (Note 13)	63,885,630	59,128,080
Excess of revenue over expenses for the year	-	-
Net assets, beginning of year	-	-
Net assets, end of year	-	-

Statement of cash flows
year ended December 31, 2012 and 2011

	2012	2011
	$	$
Operating activities		
Cash received from contributions	61,307,286	65,273,395
Interest received	50,269	28,120
	61,357,555	65,301,515
Cash paid for salaries and benefits, materials and services	(65,520,775)	(56,545,227)
	(4,163,220)	8,756,288
Investing activity		
Purchase of capital assets	(795,921)	(1,385,804)
Net (decrease) increase in cash	(4,959,141)	7,370,484
Cash, beginning of year	9,936,140	2,565,656
Cash, end of year (Note 4)	4,976,999	9,936,140

Notes to the financial statements

December 31, 2012 and 2011

1. Description of organization

The Nuclear Waste Management Organization ("NWMO") is a not-for-profit corporation without share capital, established under the *Canada Corporations Act*, 1970 ("the *Act*"), as required by the *Nuclear Fuel Waste Act (Canada), 2002 ("NFWA")* which came into force November 15, 2002.

The *NFWA* requires electricity-generating companies which produce used nuclear fuel to establish a waste management organization. In accordance with the *NFWA*, the NWMO established an Advisory Council, conducted a study and provided recommendations on the long-term management of used nuclear fuel to the Government of Canada. The results of the study and the recommendations were submitted in November 2005. As part of the long-term mandate, the NWMO is now responsible for implementing the Adaptive Phased Management (APM), an approach selected by the Government of Canada to address the management of used nuclear fuel.

The NWMO formally began operations on October 1, 2002. Its founding members are Hydro-Québec, NB Power Nuclear, and Ontario Power Generation Inc. ("Members") – which are Canadian companies that currently produce used nuclear fuel as a by-product of electricity generation.

Pursuant to a Membership Agreement, the APM costs of the NWMO are shared pro rata by the Members based on the number of used fuel bundles owned by each member. The cost sharing ratios among members have not been changed since inception of the Membership Agreement.

In addition to the above mandate, effective January 1, 2009, the NWMO entered into two new agreements with Ontario Power Generation Inc. (OPG) to expand its operations to provide project management services for OPG's Low and Intermediate Level Waste Deep Geologic Repository (DGR services – Phase 1) and certain provision costing and accounting services relating to nuclear lifecycle liability management (LLM services).

Effective February 1, 2011, the NWMO entered into an Engineering, Procurement and Construction Management Agreement for the DGR phase 2 (design) and phase 3 (construction) services with OPG. The design services cover detailed engineering, geoscience characterization, environmental and safety assessment, community engagement and regulatory affairs. Phase 3, the construction services, is pending government approval as well as both parties, OPG and the NWMO, mutually agreeing to proceed with this service.

2. Adoption of the new accounting standards

Basis of presentation

During the year ended December 31, 2012, the NWMO adopted the new accounting standards for not-for profit organizations (the "new standards") issued by the Canadian Institute of Chartered Accountants ("CICA") and set out in Part III of the CICA Handbook. The NWMO also applies the standards for private enterprises in Part II of the CICA Handbook to the extent that the Part II standards address topics not addressed in Part III. In accordance with Section 1501 of the CICA Handbook, "First-time adoption", ("Section 1501"), the date of transition to the new standards is January 1, 2011 and the NWMO has presented an opening statement of financial position as at that date. This opening statement of financial position is the starting point for the NWMO's accounting under the new standards. In its opening statement of financial position, under the recommendations of Section 1501, the NWMO:

- recognized all assets and liabilities, the recognition of which is required by the new standards;
- did not recognize items as assets or liabilities if the new standards do not permit such recognition;
- reclassified items that it recognized previously as one type of asset, liability or component of net assets, but are recognized as a different type of asset, liability or component of net assets under the new standards; and
- applied the new standards in measuring all recognized assets and liabilities.

In accordance with the requirements of Section 1501, the accounting policies set out in Note 3 have been consistently applied to all years presented. The NWMO has not applied any of the exemptions available under Section 1501, as it has determined there is no financial impact on the financial statements.

Impact of the adoption of the new standards on net assets as at January 1, 2011

The adoption of this new financial reporting framework has no impact on the previously reported statement of financial position as at January 1, 2011, or on the previously reported statements of operations and changes in net assets and cash flows for the year ended December 31, 2011. Consequently, a reconciliation of previously reported items to those reported using the new standards has not been prepared.

3. Significant accounting policies

Basis of presentation

The financial statements of the NWMO are the representations of management prepared in accordance with Canadian accounting standards for not-for-profit organizations set out in Part III of the CICA Handbook using the deferral method of reporting restricted contributions. The significant accounting policies adopted by the NWMO are as follows:

3. Significant accounting policies (continued)

Capital assets

Capital assets are recorded at cost. Amortization is provided for on a straight-line basis over their estimated useful lives as follows:

Furniture & office equipment	7 years
Computer equipment and software	3 years
Vehicles	5 years
Leasehold improvements	Initial lease term plus one renewal period

Income tax

The NWMO is a not-for-profit organization and, pursuant to section 149(1)(1) of the *Income Tax Act*, is not subject to income tax.

Revenue recognition

Contributions received from members are treated as restricted contributions and as such, are not recognized into revenue until associated costs have been incurred. Any excess or shortfall of member contributions is recorded as deferred revenue or member contribution receivable, respectively.

Contributions used for the purchase of capital assets owned by the NWMO are deferred and amortized into revenue at a rate corresponding with the amortization rate of the related capital assets.

Pension and other post-employment benefits

The NWMO's post-employment benefit programs include a contributory defined benefit registered pension plan, a defined benefit supplementary pension plan, and other post-employment benefits, including group life insurance, health care and long-term disability benefits. The NWMO has adopted the following policies with respect to accounting for these post-employment benefits:

(i) The NWMO accrues its obligations under pension and other post-employment benefit ("OPEB") plans. The obligations for pension and OPEB costs are determined using the projected benefit method prorated on service. Under this method, the benefit costs are amortized over the average remaining service period of active employees. Any excess of the net actuarial gain (loss) over 10% of the greater of the benefit obligation and the fair value of plan assets is amortized over the average remaining service period of active employees. The average remaining service period for active employees is 15 years (Note 9).

(ii) The obligations are affected by salary levels, inflation, and cost escalation of specific items (e.g. dental and health claims). Pension and OPEB costs and obligations are determined annually by independent actuaries using management's best estimate assumptions. The discount rates used by the NWMO in determining projected benefit obligations and the costs for the Organization's employee benefit plans are based on representative AA corporate bond yields.

(iii) Pension fund assets are valued using market-related values for the purposes of determining actuarial gains or losses and the expected return on plan assets. The plan's assets consist of investment grade securities. Market and credit risk on these securities are managed by the plan by placing plan assets in trust and through the plan investment policy.

Research and development
Research and development costs are charged to operations in the year incurred.

Foreign currency translation
Monetary assets and liabilities denominated in foreign currencies are translated into Canadian currency at the year-end exchange rate. Any resulting gain or loss is reflected in staffing and administration expenses. Transactions in foreign currencies throughout the year have been converted at the exchange rate prevailing at the date of the transaction.

Financial instruments
Financial instruments include cash, accounts receivable, and accounts payable and accrued liabilities.

Financial assets and financial liabilities are initially recognized at fair value when the NWMO becomes a party to the contractual provisions of the financial instrument. Subsequently, all financial instruments are measured at amortized cost. Financial assets measured at amortized cost are assessed at each reporting date for indications of impairment. If such impairment exists, the asset is written down and the resulting impairment loss is recognized in the statement of operations and changes in net assets.

Related party transactions
Related party transactions are recorded at the exchange amount.

Use of estimates
The preparation of financial statements in conformity with Canadian generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosures of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Due to the inherent uncertainty in making estimates, actual results could differ from those estimates. Accounts requiring significant estimates include pension and other post-employment benefits, certain accrued liabilities and amortization which is based on the estimated useful life of the capital assets.

4. Cash

Included in cash is an amount of $3,073,500 (December 31, 2011 – $2,709,900; January 1, 2011 – $1,891,800) which is restricted as this amount is securing a Letter of Credit issued for the Supplementary Pension Plan (Note 9).

5. Capital assets

	December 31, 2012		
	Cost	Accumulated amortization	Net book value
	$	$	$
Furniture and office equipment	1,810,820	955,953	854,867
Computer equipment and software	1,677,013	1,086,074	590,939
Leasehold improvements	2,234,099	793,821	1,440,278
Custom vehicle in progress	263,294	-	263,294
	5,985,226	2,835,848	3,149,378

	December 31, 2011		
	Cost	Accumulated amortization	Net book value
	$	$	$
Furniture and office equipment	1,731,837	702,906	1,028,931
Computer equipment and software	1,223,369	744,309	479,060
Leasehold improvements	2,234,099	491,682	1,742,417
	5,189,305	1,938,897	3,250,408

	January 1, 2011		
	Cost	Accumulated amortization	Net book value
	$	$	$
Furniture and office equipment	1,518,127	480,481	1,037,646
Computer equipment and software	1,396,166	661,509	734,657
Leasehold improvements	1,421,447	328,345	1,093,102
	4,335,740	1,470,335	2,865,405

The net book value of leasehold improvements written off during the year, due to termination of a lease prior to the end of the lease term, resulted in a loss of $Nil (2011 – $150,025), which is included in amortization expense.

6. Related party transactions, balances and other information

Transactions and balances not otherwise disclosed separately in the financial statements are as follows:

	December 31, 2012		
	APM	LLM/DGR	Total
	$	$	$
Transactions during the year			
Member contributions			
Ontario Power Generation Inc.	30,932,000	26,590,357	57,522,357
New Brunswick Power	1,475,000	-	1,475,000
Hydro-Québec	1,909,136	-	1,909,136
	34,316,136	26,590,357	60,906,493
Transactions with Ontario Power Generation Inc.			
Receipts			
Managerial services (included in staffing and administration)			(103,534)

	December 31, 2011		
	APM	LLM/DGR	Total
	$	$	$
Transactions during the year			
Member contributions			
Ontario Power Generation Inc.	28,606,000	34,089,000	62,695,000
New Brunswick Power	1,201,000	-	1,201,000
Hydro-Québec	1,060,375	-	1,060,375
	30,867,375	34,089,000	64,956,375
Transactions with Ontario Power Generation Inc.			
Payments			
Managerial services (included in staffing and administration)			303,699

Included in accounts receivable is an amount of $Nil (December 31, 2011 – $103,534; January 1, 2011 – $Nil) receivable from OPG.

The NWMO and OPG signed a Pension Transfer Agreement in 2008 in which OPG agreed to transfer the liability associated with the pension benefits that accrued during the time the NWMO employees were employed by OPG and the cash equal to that liability from its pension plan.

In order to transfer the liability and cash from the OPG Pension Plan to the NWMO Pension Plan, OPG was required to seek approval from the Ontario pension regulator, the Financial Services Commission of Ontario. This approval was issued on August 31, 2012, and approved by the NWMO's Board of Directors on November 29, 2012. Accordingly, a cash amount of $31.75 million was transferred from the OPG Pension Fund to the NWMO Pension Fund on November 30, 2012, in settlement of the Pension Transfer Agreement.

7. Member contributions receivable and deferred member contributions

The NWMO receives contributions from its members and is solely funded through their contributions. The contributions received from the members are restricted in nature and thus revenue is recognized when qualifying expenses are incurred. Amounts received in advance of qualifying expenses are recorded as deferred member contributions. Commitments for contributions which have not been received by the NWMO are recorded as contributions receivable when the amount is determinable and the ultimate collection is likely.

(a) Member contributions receivable

Member contributions receivable are made up of the following:

	December 31, 2012	December 31, 2011	January 1, 2011
	$	$	$
Ontario Power Generation	3,812,994	-	5,212,039
New Brunswick Power	8,799	-	-
	3,821,793	-	5,212,039

(b) Deferred member contributions

Deferred member contributions are made up of the following:

	December 31, 2012	December 31, 2011	January 1, 2011
	$	$	$
Ontario Power Generation	-	150,902	-
New Brunswick Power	-	85,392	55,370
Hydro-Québec	484,186	27,864	51,625
Atomic Energy of Canada Limited	117,755	156,185	166,927
	601,941	420,343	273,922

(c) Long-term deferred member contributions

Long-term deferred member contributions represent amounts received in advance to fund various employee future benefits as follows:

	December 31, 2012	December 31, 2011	January 1, 2011
	$	$	$
Deferred pension asset	13,362,177	10,846,532	9,321,260
Other post employment benefits	(8,299,407)	(7,020,912)	(5,940,612)
Pension and other post-employment benefit liabilities – short term (Note 9)	(94,000)	(70,000)	(55,000)
	4,968,770	3,755,620	3,325,648

(d) Continuity of deferred member contributions

The continuity of deferred member contributions is as follows:

	December 31, 2012	December 31, 2011	January 1, 2011
	$	$	$
Balance, beginning of year			
Deferred member contributions – current	420,343	273,922	509,330
Deferred member contributions – long term	3,755,620	3,325,648	2,886,054
	4,175,963	3,599,570	3,395,384
Contributions received	61,307,286	65,273,395	42,194,582
Contributions receivable	3,821,793	-	5,212,039
Contribution revenue recognized	(63,835,361)	(59,099,960)	(46,818,330)
Amounts received previously recognized	-	(5,212,039)	(704,574)
Change related to capital contributions	101,030	(385,003)	320,469
	5,570,711	4,175,963	3,599,570
Balance, end of year			
Deferred member contributions – current	(601,941)	(420,343)	(273,922)
Deferred member contributions – long term	4,968,770	3,755,620	3,325,648

8. Deferred capital contributions

	December 31, 2012	December 31, 2011	January 1, 2011
	$	$	$
Balance, beginning of year	3,250,408	2,865,405	3,185,874
Contributions for the purchase of capital assets	795,921	1,385,804	479,230
Less amortization into revenue	(896,951)	(1,000,801)	(799,699)
Balance, end of year	3,149,378	3,250,408	2,865,405

9. Pension and other post-employment benefit plans

Effective January 1, 2009, the NWMO offers certain benefits to employees and retirees. A brief overview of these benefit plans is set out below.

(a) Registered pension plan

The registered pension plan is a contributory defined benefit plan covering most employees and retirees. The Plan is funded and fund assets include pooled funds that are managed by Connor, Clark and Lunn. The benefit costs and assets related to this plan are recorded in the NWMO's financial statements.

(b) Supplementary pension plan

The supplementary pension plans are defined benefit plans covering certain employees and retirees. The plan is unfunded.

(c) Other post-employment benefit plans

These other post-employment benefit plans provide medical, dental, and group life insurance coverage for certain groups of full-time employees who have retired from the NWMO.

The most recent actuarial valuation in accordance with CICA Handbook Section 3461 of the registered pension plan, supplementary pension plan and other post-employment benefit plans was completed as of December 31, 2011. The liability as at December 31, 2012, is based on an extrapolation of the previous valuation.

A funding valuation, which was completed for the pension plan as of January 1, 2012, reported a surplus of $8.1 million on a going concern basis and a deficit of $15.0 million on a solvency basis.

The significant actuarial assumptions adopted in estimating the NWMO's accrued benefit obligations are as follows:

	Registered pension plan		Supplementary pension plan		Other post-employment benefit plans	
	2012	2011	2012	2011	2012	2011
	%	%	%	%	%	%
Assumptions for						
Benefit obligation and costs						
Discount rate at the beginning of the period	4.75	5.5	4.75	5.5	4.75	5.5
Salary schedule escalation rate	3	3	3	3	-	-
Rate of cost of living increase	2	2	2	2	-	-
Rate of increase in health care cost trend	-	-	-	-	6.5	6.5
Discount rate at the end of the period	4	4.75	4	4.75	4	4.75
Expected return on plan assets	6.5	6.5	-	-	-	-
Average remaining service life for employees	15 years	12 years	15 years	12 years	15 years	16 years

9. Pension and other post-employment benefit plans (continued)

Information for the NWMO's pension and post-employment benefits, including long-term disability (LTD) is as follows:

	December 31, 2012		
	Registered pension plan	Supplementary pension plan	Other post-employment benefit plans
	$	$	$
Changes in accrued benefit obligation			
Accrued benefit obligation, January 1	(41,683,000)	(2,518,052)	(8,028,000)
Current service cost	(2,272,000)	(358,000)	(514,000)
Interest cost	(2,092,000)	(142,000)	(394,000)
Employee contribution	(2,721,000)	-	-
Benefits paid	1,240,000	176,600	89,000
Net actuarial loss	(6,724,000)	(5,000)	(3,038,000)
Accrued benefit obligation, December 31	(54,252,000)	(2,846,452)	(11,885,000)
Changes in plan assets			
Fair value of plan assets, January 1	41,053,000	-	-
Actual return on plan assets	3,927,000	-	-
Benefits paid	(1,240,000)	-	(89,000)
Employers' contribution	4,612,000	-	89,000
Employees' contribution	2,721,000	-	-
Fair value of plan assets, December 31	51,073,000	-	-
Funded status			
Unfunded benefit obligation	(3,179,000)	(2,846,452)	(11,885,000)
Unamortized net actuarial loss	16,541,177	764,045	5,574,000
Accrued benefit asset (liability)	13,362,177	(2,082,407)	(6,311,000)
Short-term portion	-	(5,000)	(89,000)
Long-term portion	13,362,177	(2,077,407)	(6,222,000)
	13,362,177	(2,082,407)	(6,311,000)
Components of cost recognized			
Current service cost, net of employee contribution	2,272,000	358,000	514,000
Interest cost on accrued benefit obligation	2,092,000	142,000	394,000
Amortization of net actuarial loss	487,000	35,000	125,000
Expected return on plan asset	(2,755,000)	-	-
Cost recognized	2,096,000	535,000	1,033,000

	December 31, 2011		
	Registered pension plan	Supplementary pension plan	Other post-employment benefit plans
	$	$	$
Changes in accrued benefit obligation			
Accrued benefit obligation, January 1	(30,113,000)	(2,154,100)	(6,207,942)
Current service cost	(1,434,000)	(281,000)	(394,000)
Interest cost	(1,747,000)	(137,000)	(350,000)
Transfers in/buyback	(1,668,379)	-	-
Employee contribution	(769,621)	-	-
Benefits paid	629,000	103,048	77,000
Net actuarial loss	(6,580,000)	(49,000)	(1,153,000)
Accrued benefit obligation, December 31	(41,683,000)	(2,518,052)	(8,027,942)
Changes in plan assets			
Fair value of plan assets, January 1	34,960,000	-	-
Actual return on plan assets	1,863,000	-	-
Employees' transfers/buyback	1,668,379	-	-
Benefits paid	(629,000)	-	(77,000)
Employers' contribution	2,421,000	-	77,000
Employees' contribution	769,621	-	-
Fair value of plan assets, December 31	41,053,000	-	-
Funded status			
Unfunded benefit obligation	(630,000)	(2,518,052)	(8,027,942)
Unamortized net actuarial loss	11,476,532	794,000	2,661,082
Accrued benefit asset (liability)	10,846,532	(1,724,052)	(5,366,860)
Short-term portion	-	(4,000)	(66,000)
Long-term portion	10,846,532	(1,720,052)	(5,300,860)
	10,846,532	(1,724,052)	(5,366,860)
Components of cost recognized			
Current service cost, net of employee contribution	1,434,000	281,000	394,000
Interest cost on accrued benefit obligation	1,747,000	137,000	350,000
Amortization of net actuarial loss	82,000	48,000	65,000
Expected return on plan asset	(2,367,000)	-	0
Cost recognized	896,000	466,000	809,000

	January 1, 2011		
	Registered pension plan	Supplementary pension plan	Other post-employment benefit plans
	$	$	$
Accrued benefit obligation	(30,113,000)	(2,154,100)	(6,207,942)
Fair value of plan assets	34,960,000	-	-
Funded status			
Funded excess (unfunded benefit obligation)	4,847,000	(2,154,100)	(6,207,942)
Unamortized net actuarial loss	4,474,260	793,000	1,573,430
Accrued benefit asset (liability)	9,321,260	(1,361,100)	(4,634,512)
Short-term portion	-	-	(55,000)
Long-term portion	9,321,260	(1,361,100)	(4,579,512)
	9,321,260	(1,361,100)	(4,634,512)

9. Pension and other post-employment benefit plans (continued)

An amount of $94,000 (December 31, 2011 – $70,000; January 1, 2011 – $55,000) that is included in accounts payable and accrued liabilities, is part of the total $8,393,407 (December 31, 2011 – $7,090,912; January 1, 2011 – $5,995,512) of the accrued benefit liability at end of year of the supplementary pension and other post-employment benefits/LTD plans.

The pension and other post-employment benefit costs recognized are included in the respective expense categories in the statement of operations and changes in net assets.

Sensitivity information related to the other post-employment benefit plans is as follows:

	December 31, 2012	December 31, 2011	January 1, 2011
	$	$	$
Effect of 1% increase in health care cost trends on			
Accrued benefit obligation	2,683,000	1,739,000	1,181,000
Service cost and interest cost	230,000	168,000	154,000
Effect of 1% decrease in health care cost trends on			
Accrued benefit obligation	(2,007,000)	(1,319,000)	(917,000)
Service cost and interest cost	(169,000)	(125,000)	(115,000)

The supplementary pension plan is not funded, but is secured by a Letter of Credit (Note 4).

10. Deferred lease inducements

	December 31, 2012	December 31, 2011	January 1, 2011
	$	$	$
Tenant inducements	408,242	408,242	263,076
Less: accumulated amortization	(212,013)	(146,381)	(80,749)
	196,229	261,861	182,327

11. Guarantees

In the normal course of business, the NWMO enters into agreements that meet the definition of a guarantee.

(a) The NWMO has provided indemnities for various agreements such as lease agreements. Under the terms of these agreements, the NWMO agrees to indemnify the counterparty for various items including, but not limited to, all liabilities, loss, suits and damages arising during, on or after the term of the agreement.

(b) The NWMO indemnifies all directors, officers and employees acting on behalf of the NWMO for various items including, but not limited to, all costs to settle suits or actions due to services provided to the NWMO, subject to certain restrictions.

The nature of these indemnification agreements prevents the NWMO from making a reasonable estimate of the maximum exposure due to the difficulties in assessing the amount of liability which stems from the unpredictability of future events and the unlimited coverage offered to counterparties. Historically, the NWMO has not made any payments under such or similar indemnification agreements, and therefore, no amount has been accrued with respect to these agreements.

The NWMO also arranged a standby Letter of Credit to secure its supplementary pension plan (Note 9).

12. Operating leases

The NWMO has entered into a number of leases for office premises which expire at various dates up to July 2017.

The estimated annual minimum payments over the initial term of these leases for the next 5 years are as follows:

	$
2013	785,900
2014	660,733
2015	537,608
2016	537,608
2017	268,804
	2,790,653

13. Segment reporting

The NWMO has two reportable segments as follows:

- Federal mandated program (Adaptive Phased Management of long-term used nuclear fuel – "APM");
- Other direct services outside its mandated programs, which include the Deep Geologic Repository (DGR) and Life Cycle and Liability Management (LLM) for OPG, with service contracts which became effective January 1, 2009, and February 1, 2011.

Segment information is as follows:

	APM		DGR/LLM		Total	
Year Ended December 31	2012	2011	2012	2011	2012	2011
	$	$	$	$	$	$
Contribution revenue	37,319,049	28,292,734	26,516,312	30,807,226	63,835,361	59,099,960
Interest income	28,670	13,216	21,599	14,904	50,269	28,120
Total revenue	37,347,719	28,305,950	26,537,911	30,822,130	63,885,630	59,128,080
Amortization of capital assets	718,176	846,015	178,775	154,786	896,951	1,000,801
Operating cost	36,629,543	27,459,935	26,359,136	30,667,344	62,988,679	58,127,279
Total Cost	37,347,719	28,305,950	26,537,911	30,822,130	63,885,630	59,128,080
Expenditure for capital assets	734,914	874,442	61,007	511,362	795,921	1,385,804

The allocation of the common service costs to each function of the above segment is based on the number of direct staff in each function.

14. Government remittances

Accounts payable and accrued liabilities include the following amounts with respect to government remittances:

	December 31, 2012	December 31, 2011	January 1, 2011
	$	$	$
HST/GST payable	728,950	1,446,510	364,609
Less HST/GST receivable	(236,441)	(219,773)	(222,129)
Net HST/GST payable	492,509	1,226,737	142,480
WSIB payable	732	-	743
	493,241	1,226,737	143,223

Commonly Used Abbreviations

AECL	Atomic Energy of Canada Limited
ALARA	As low as reasonably achievable
APM	Adaptive Phased Management
APM-GRG	Adaptive Phased Management Geoscientific Review Group
BRC	Blue Ribbon Commission on America's Nuclear Future
CLC	Community liaison committee
CNSC	Canadian Nuclear Safety Commission
CSRP	Corporate Social Responsibility Program
EDRAM	International Association for Environmentally Safe Disposal of Radioactive Materials
FCM	Federation of Canadian Municipalities
HQ	Hydro-Québec
IAEA	International Atomic Energy Agency
ICGR	International Conference on Geological Repositories
ITRG	Independent Technical Review Group
L&ILW	Low and intermediate level waste
NAGRA	National Cooperative for the Disposal of Radioactive Waste (Switzerland)
NBPN	NB Power Nuclear
NEA	Nuclear Energy Agency
NFWA	*Nuclear Fuel Waste Act*
NSCA	*Nuclear Safety and Control Act*
NWMO	Nuclear Waste Management Organization
OECD	Organisation for Economic Co-operation and Development
ONFA	*Ontario Nuclear Funds Agreement*
OPG	Ontario Power Generation, Inc.
RP&T	Reprocessing, partitioning and transmutation
SKB	Swedish Nuclear Fuel and Waste Management Company
UNENE	University Network of Excellence in Nuclear Engineering
WIPP	Waste Isolation Pilot Plant