NWMO APM Final Report – Union of New Brunswick Indians

APM-REP-00624-0002 November 2009

Union of New Brunswick Indians

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

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Nuclear Waste Management Organization

Adaptive Phase Management

Submitted by

Union of New Brunswick Indians

Final Report

November 30, 2009

Nuclear Waste Management Organization
Adaptive Phase Management

Final Report

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Nuclear Waste Management Organization Adaptative Phase Management – Site Selection for Repository of Nuclear Waste

Background:

On March 2009, Pat Patton, Director of Aboriginal Relations of NWMO from Toronto along with N B Elders, Gwen Bear and Donna Augustine made a presentation to the Board of Directors in Fredericton offering to the Chiefs of First Nations in New Brunswick an opportunity to participate in the dialogue on the site selection phase for disposal of waste generated by nuclear plants, such as, Pt. Lepreau power generation plant in Lepreau, New Brunswick.

A proposal for the participation of First Nation communities was drafted and presented to the Board and submitted to Pat Patton for consideration. The budget was revised and approved for funding but funds did not flow until July delaying the number of activities planned. Two coordinators were hired and a visit to Pt. Lepreau for the two newly hired coordinators and two UNBI staff, who had a visit in the past. The tour was very informative for the coordinators and an up-date for UNBI Staff on Pt. Lepreau expansion since the last visit as refurbishment was well underway and waste is stored in the newly constructed containers. Documents and material provided by NWMO was reviewed by the coordinators, as part of their orientation to the project.

Methodology:

The following methodology was undertaken:

- Two coordinators hired one Mik'maq and one Maliseet
- Review and orientation on the project and related activities in the past
- Scheduling of provincial meetings/workshops etc.
- NWMO assistance in workshops
- Steering Committee established using the Aboriginal Natural Resource Committee consisting of 10 members. Two Chiefs, two Elders, Executive Director of UNBI, Health Director of UNBI, Engineer – North Shore Micmac District Council, Policy Analyst of UNBI, Biologist of UNBI and Liaison Coordinator of UNBI.
- Working group consisting of NB Power Nuclear Representative and four UNBI Staff to work on the details was established.

- NWMO Power Point Presentation was reformatted by UNBI Coordinators and NB Power representative maintaining the message but changing the background to Aboriginal design.
- The Board of Directors of UNBI who are the Chiefs of each of the 12 First Nation members provided direction and approvals.
- Newsletters were drafted and distributed.
- Provincial workshops held in Fredericton, Metepenagiag, and Oromocto. Community meetings held in Madawaska Maliseet First Nations with the Steering Committee and a Board of Directors Meeting on different dates, Eel River Bar First Nation, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation.
- Up-grading of UNBI website will be undertaken.
- Additional visits to Pt. Lepreau will be promoted and funded as budget allows.
- A power point presentation on uranium was added and delivered by a consultant to provide a better understanding in the nuclear waste produced from the fuel uranium.
- A meeting with Mawiw Council to better coordinate meetings/workshops with NWMO Staff in the area.
- Purchased necessary equipment for power point presentations.

Findings:

Lack of awareness on nuclear generation was determined very early and lack of awareness where Pt. Lepreau was located.

Very little interest on the issue of waste production from the nuclear plant was evident in the number of participants attending the local community meetings.

The provincial workshops were poorly attended.

The Steering Committee role was taken up by the Aboriginal Natural Resource Committee (ANRC) formed in 1990. Some members of the ANRC had visited Pt. Lepreau earlier during the Dialogue Sessions of NWMO.

The storage silos had undergone expansion since the last visit of UNBI Staff. New ideas on how to increase awareness and interest were proposed by the ANRC and coordinators. A newsletter was proposed and reformatting of the NWMO presentation was completed without

changing the message and the working group added additional information to the presentation regarding Pt. Lepreau.

There was little awareness on radiation and its effects. Some members and participants were aware of the radiation experienced in Japan and Russia.

Some interest in the economical value of Pt. Lepreau vs. other models of power generation.

Major concerns on the effects on Aboriginal Title, Aboriginal/Treaty Rights, and effects on hunting and gathering should an accident occur. How lengthy would the effects last and would there be compensation for Aboriginal People.

Major concern on transportation which will cross traditional territories and can be hazardous to the First Nations and its members depending on method of transportation on land or sea.

Within three months of activity with ANRC, Coordinators and newsletters and presentations made to the Board of Directors and community members some awareness and interest was displayed as evidenced by the questions asked.

NWMO staff have been very helpful in support for the provincial meetings and have provided much information to be left behind with communities and Board of Directors. However the distance covered by the NWMO Staff makes scheduling a factor in the workshops as NWMO has to travel from Ontario and other regions.

Information left at communities, etc. is very technical and is geared toward those with some knowledge in the nuclear field and industry.

Several older participants have difficulty in converting to the metric system.

Several of the show and tell displays are in the possession of NB Power Nuclear is shown and returned to NB Power Nuclear.

NWMO has too much say in how the process should continue, they control the budget, they are financed by the waste producers, and in the end accountable to the waste producers.

Not enough importance given to Aboriginal Title to the land and resources at Pt. Lepreau and other traditional lands in New Brunswick.

Recommendations:

- NWMO should be flexible on how the First Nations and organizations seek input from their members; their hunters; fishers, gatherers of medicine and berries, and of wood for baskets, in the area and along the proposed routes land or sea
- The NWMO should give time for awareness to be promoted in the First Nation Communities at their pace.
- The NWMO should support independent flow of funding directly to First Nations and Organizations to carry on the awareness and capacity building.
- The NWMO should not decide what is relevant to UNBI project such as mining, seen by First Nation as important to understand the whole picture. Many questions of economics on Pt. Lepreau vs. other generation fuels.
- There is a need to understand the effects of radiation, the length of radiation on plants and animals, how the livelihood will be disrupted in the Aboriginal rights to hunt, fish, and gather, who will compensate in the event of an accident many questions not answerable at this time, also question of value.
- Several terms used by NWMO Staff, such as community, should be defined.
- Measuring devises should be available to each community and training on-going as how to use them.
- How does clean-up happen in the event of an accident and by whom; should be addressed.
- What are the benefits, who benefits – will First Nations benefit.
- What are other First Nations and Organizations concerns and benefits, more in Ontario?
- Youth should have opportunity and be encouraged to participate in the project.
- What jobs will come out of this in the long term.
- What training opportunities will come out of this.

Conclusion:

In conclusion UNBI feels that: It is vital that First Nations and their Organizations have a full understanding in the production of nuclear

waste and the impact of nuclear waste on future generations and to be kept abreast of changes as they occur.

Capacity building should be undertaken, immediately. There are benefits in employment and training needs, business, partnerships and benefits yet to be determined.

All aspects of monitoring and capacity building should be funded for generations to come.

Communications, trust relationships and accountability be two way.

Aboriginal Title to the land, air and water resources be recognized and honored by all parties; Government, companies, public and private sectors.

Negotiations be undertaken to develop firstly, an MOU and a long-term benefits agreement.

That the relations established between NWMO and UNBI broaden.

That the funding provided should be long-term, five years or more to capacity build and maintain necessary staff.

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&
Nuclear Waste Management Organization

News Letter Edition 3

Nov 19/2009

Intro:

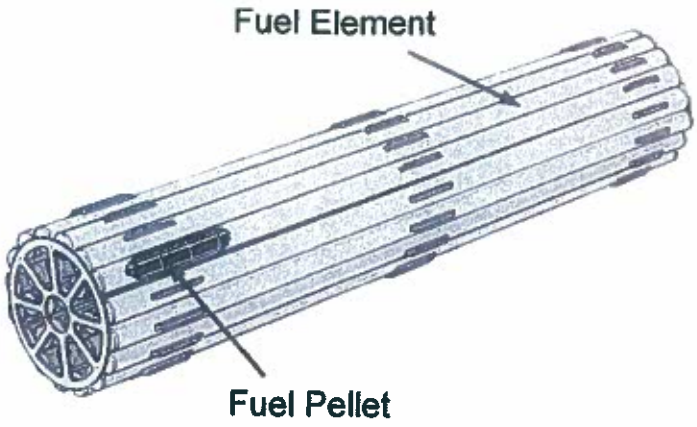
UNBI along with the NWMO, are working together to inform all First Nations communities in New Brunswick about designing the process of selecting a site for all of Canada's used nuclear fuel.

Goals:

UNBI and the NWMO goals are to send two project coordinators (Kyle Nash Maliseet) and (George Paul mi'gmaq) to each First Nation community and present a power point presentation on nuclear waste and the site selection process for a "Deep Geological Repository" for all of Canada. The information and questions that we receive are very important to help design the process and what it should consist of. We will be in contact with each First Nation community to schedule a date to have this presentation. Follow up meetings are going to be accentual later on, to collect any additional information and provide answers to any questions that we might have missed or were unable to answer at the present time. They encourage each First Nation community member to participate in this project. If you have any questions or need additional info, feel free to contact Kyle Nash # 1506 261-1962/ e-mail: nashkyle@hotmail.com or George Paul #1506 622-8046 /e-mail: standingbull2@hotmail.com

The methodology behind this project consists of:

- Nuclear Waste Management Organization (Pat Patton, Donna Augustine, Gwen Bear)
- Steering committee (Aboriginal Natural Resources committee)
- The Board of Directors
- Working group (Ron Perley UNBI, Norville Getty UNBI, Kathleen Duguay of NB Power, Kyle Nash project coordinator, George Paul project coordinator)
- Community Workshops
- Provincial Workshops
- Point Lepreau Visits
- News Letter



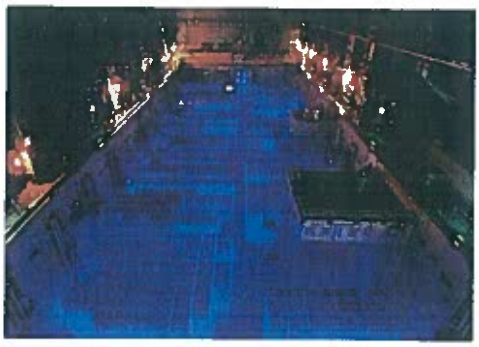
What is Nuclear Waste?

It is the radioactive material that is discarded from any nuclear activity. At Point Lepreau nuclear generating station the used fuel is part of their waste.

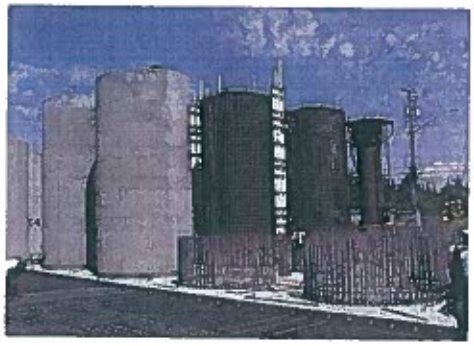
Storage of used nuclear fuel

Used fuel is stored in water-filled bays the size of an Olympic pool, at the nuclear plant for approximately 7 years. This is to cool the fuel and allow time for the radiation to be reduced, so that it can be safely transferred to the onsite nuclear waste management facility (concrete canisters)

Water-filled bay



concrete canisters



Designing the process for selecting a site (NWMO)

In 2008, the Nuclear Waste Management Organization (NWMO) initiated a dialogue with interested organizations and individuals on important principles and elements for a fair process to identify an informed and willing community to host facilities for the management of Canada's used nuclear fuel for the long term. Guided by this public input, we have developed a *Proposed Process for Selecting a Site* for your review and comment.

An important feature of Canada's plan for the long-term care of used nuclear fuel is the development of a deep geological repository in a technically suitable site, hosted by an informed and willing community. This will be a $16 - $24 billion national infrastructure project which will safely contain and isolate used fuel through both engineered barriers and the surrounding geology. The system will be designed so that the waste will be continually monitored and retrievable for an extended period of time. The project will also involve creation of a centre of expertise for technical, environmental and community studies related to the design and operation of deep geological repositories. It

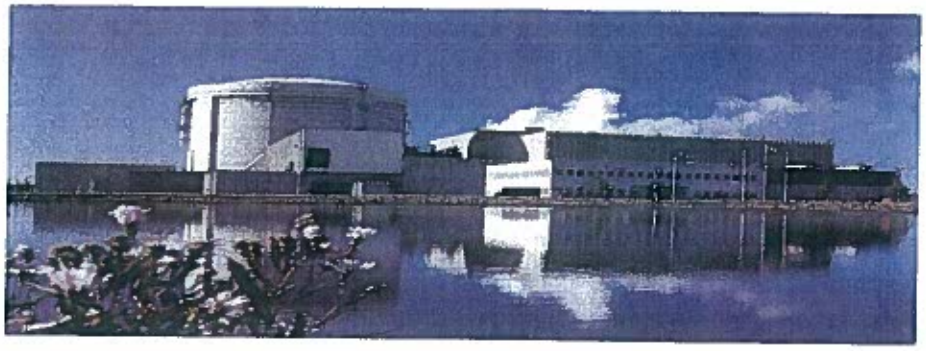
will become a hub for national and international scientific collaboration for many decades. The project will be implemented through a long-term partnership between the NWMO and an informed and willing community. It will be implemented in a way that helps foster the well-being and sustainability of the host community. Construction of the facility will proceed only after the NWMO demonstrates that all safety, health and environmental protection standards set by regulatory authorities can be met or exceeded.

Our *Proposed Process for Selecting a Site* puts safety first, with site selection guided by rigorous scientific and technical requirements. It proposes steps through which interested communities can learn more as they consider their potential interest in hosting the underground repository and the associated centre of expertise.

The *Proposed Process* is designed to be responsive to direction provided by Canadians who participated in our initial study and the 2008 dialogues. Canadians told us they want to be sure, above all, that the selected site is safe and secure for people and the environment, now and in the future. The process for choosing the site must be grounded in the values and objectives that Canadians hold important, and it must be open, transparent, fair and inclusive. The people we engaged said the process must be designed in a way that citizens can be confident that the highest scientific, professional and ethical standards will be met.

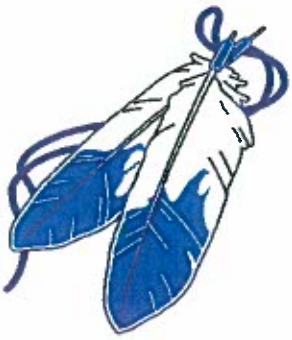
Questions & Concerns for Aboriginal peoples involvement in the process:

- Are the proposed siting principles fair and appropriate?
- Are the proposed decision-making steps consistent with selecting a site and making a fair decision?
- Do the proposed decision-making criteria address all the factors that are important? Are there others that should be added?
- Does the proposed process provide for the kinds of information and tools that are needed to support the participation of communities?
- Are there important questions that should be answered by this document but are not? What needs to be added? What changes, if any, should be made?



Point Lepreau Visits:

If there are any interested people who would like to learn more in depth information about nuclear waste and how the nuclear reactor at Point Lepreau works, we are going to be taking names after each workshop. Once we collect all the names from the interested community members, we will then go forth and contact Kathleen Duguay (NB power) of our working group, so that she will be able to set up the time and date of the visit.



Long Term Disposal of Canada's Used Nuclear Fuel

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

Introduction

- In partnership , the Union of New Brunswick Indians (UNBI) and Nuclear Waste Management Organization (NWMO) are working together to inform all NB First Nations communities about nuclear waste management. Also, designing the process for selecting a site.
- First Nations people are encouraged to participate in the site selection for this upcoming project.

Infrastructure

- Association of New Brunswick Indians Board
- UNBI Steering Committee
- Chief Joe Knockwood, Fort Folly First Nation
- Chief Joanna Bernard, Madawaska Maliseet First Nation
- Ben Paul, Mi'kmag Elder
- Christine Boone, Maliseet Elder
- Darrell Paul, Executive Director
- Nelson Solomon, Health Director
- Tim Culligan, Norhshore Micmac District Council
- Norville Getty, UNBI
- Peter Birney, UNBI
- Ronald Perley, UNBI

Nuclear Waste Management Organization

Vision

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

Mission

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

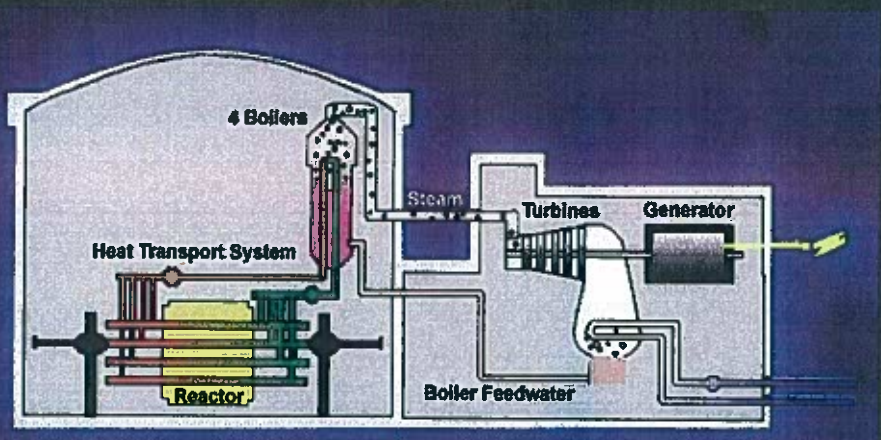
What is Nuclear Waste?

- It is radioactive material that is discarded from any nuclear activity
- At the Point Lepreau Nuclear Generating Station the used fuel is part of their nuclear waste

How is the used fuel produces at a Nuclear Station?

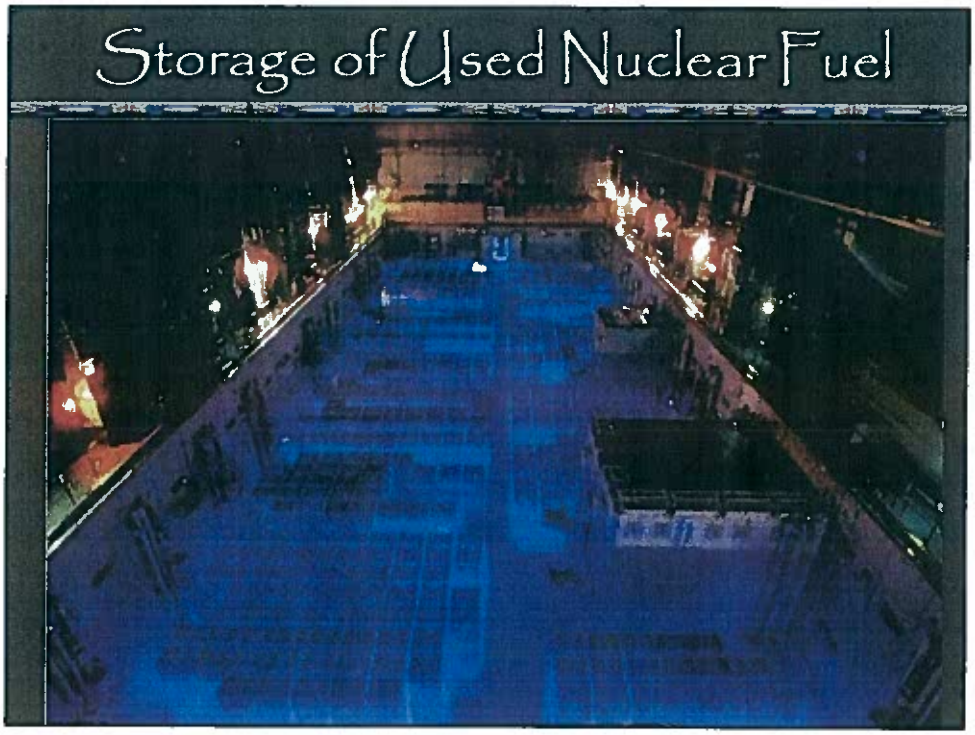
- Point Lepreau is a CANDU 6 reactor which stands for Canada, Deuterium, Uranium – 680 MW reactor
  - in operation since 1982
- All current nuclear reactor in Canada are of the CANDU type which uses natural uranium as their fuel

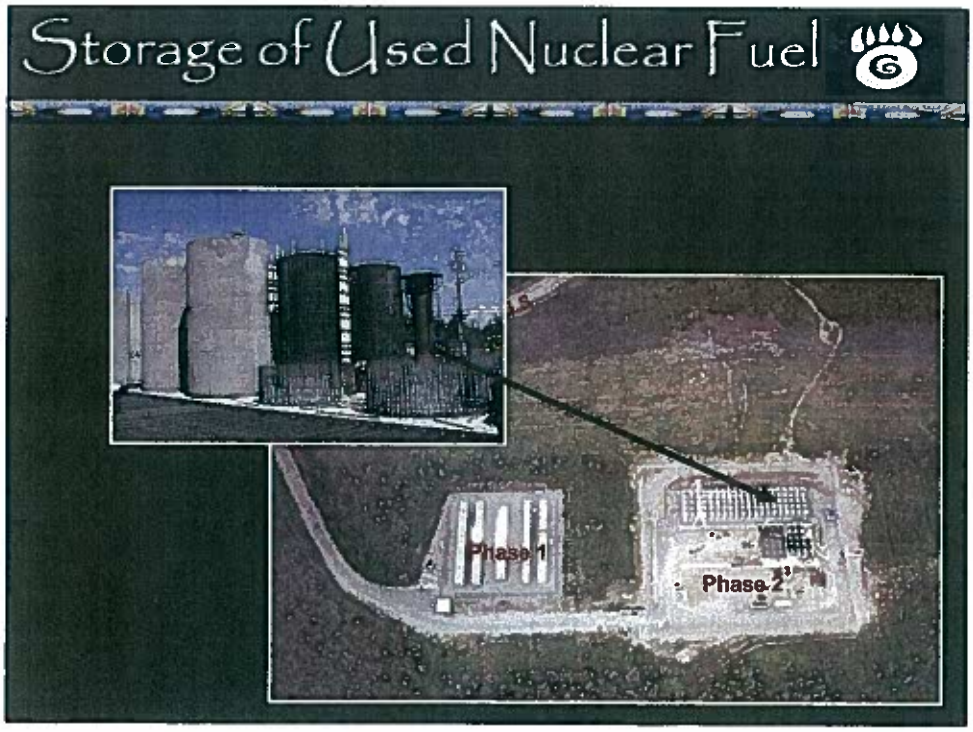
How is the used fuel produces at a Nuclear Station?



Storage of Used Nuclear Fuel

- Used fuel is stored in water-filled bays – the size of an Olympic pool at the nuclear plant for approximately 7 years
  - to cool the fuel
  - allow time for the radiation to be reduced so that it can safely be transferred to the on site nuclear waste management facility (concrete canisters)


Storage of Used Nuclear Fuel


Storage of Used Nuclear Fuel
Phase 1
Phase 2

Adaptive Phased Management

A Technical Method

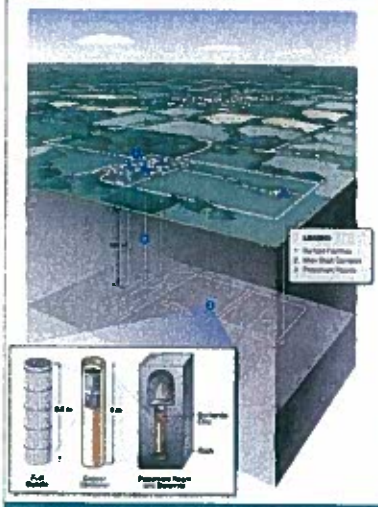
- A centralized containment and isolation of used nuclear fuel in deep geological repository
- Potential for retrievability
- Continuous monitoring
- Flexible design
- Ongoing technical and social research
- Optional step of shallow underground storage

A Management System

- Collaboration and phased decision-making
- Continuous learning and adaptation
- Open, inclusive and transparent
- Seek informed willing host community
- Public engagement and selection focused in four nuclear provinces (NB, ON, QC and SK)

NWMO's Project Description

- Federally mandated project.
- investment of $16 to $24 billion
- Implemented locally in an informed, willing community host
- High technology project, skilled employment for hundreds over many decades
- Vision to operate as a centre of excellence
- Long-term partnership between NWMO and community
- Foster community well-being
- Drawing on national research networks and international research collaboration
- Highly regulated – strict scientific, and technical criteria assure safety



How Aboriginal peoples have influenced the development of the process

INVOLVEMENT

- Meaningful involvement of affected First Nation, Métis and Inuit and respect for Aboriginal Treaties and Rights in assessment of suitability of a potential site
- Partnership of Traditional Knowledge and western knowledge
- Involvement of communities along the potential transportation route

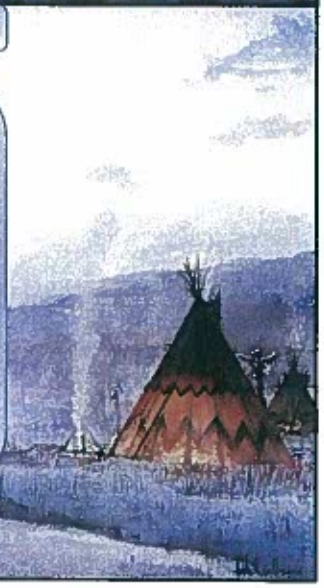
SUPPORT FOR COMMUNITY AND CAPACITY BUILDING

- Resources for capacity building
- Learn about the nuclear fuel cycle and the long-term management of used nuclear fuel
- Community visioning exercise – the long-term vision of the community for itself
- Resources to seek independent expert advice
- Resources to engage community members in decision-making
- Understanding of the long-term nature of the project and how it evolves over time

How Aboriginal peoples have influenced the development of the process

PARTNERSHIP AND INDEPENDENCE IN DECISION-MAKING

- Shared decision-making with respect for Aboriginal culture and decision-making processes
- Inclusion of First Nation, Métis and Inuit
- Respect and honour Aboriginal rights and treaties
- Opportunities for communities to conduct independent research and seek independent review
- Involvement of Aboriginal people in the learning and decision-making process; community must be willing; communities will need to understand the site selection process; allow time for people to learn and understand



How Aboriginal peoples have influenced the development of the process

LONG TERM SUSTAINABILITY OF THE COMMUNITY

- Ensuring community well-being - economic development of communities and how the community would prepare for the changes that it might experience
- Respect for current and future generations
- Establishment of a "centre of expertise" at the site
- Development of opportunities for Aboriginal youth to learn and remain involved in the process

SAFETY

- Concern for future generations
- Safety for people and the environment
- Protect and preserve all creation
- Understand how safety is achieved
- Build capacity about safety in order to make informed decisions
- Continue research on productive re-use of used fuel

Key Definitions

Interested community

- A political entity interested in the siting proces such as a city, town, village, municipality, region or other municipal structures or a combination of these
- Includes Aboriginal governments
- For Crown land and unorganized territory, the provincial government would be considered as an "interested community" in consultation with potentially affected Aboriginal peoples

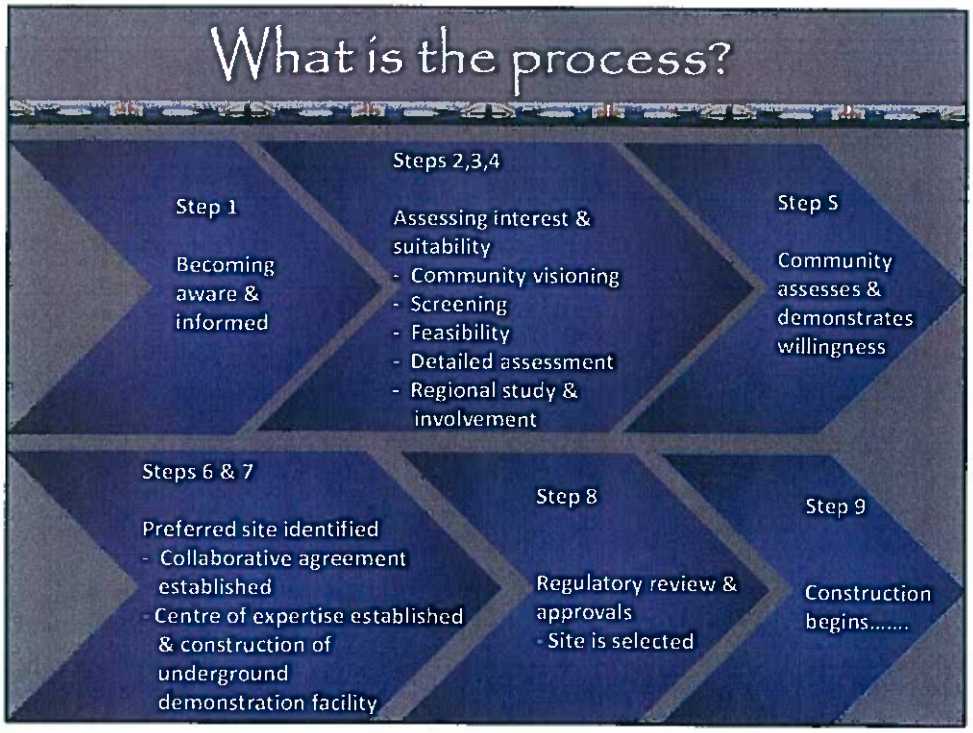
Willingness

- In initial steps, accountable political authority expresses interest on behalf of the community
- Ultimately, a compelling demonstration of willingness is required, including residents

Key Principles that guide the process

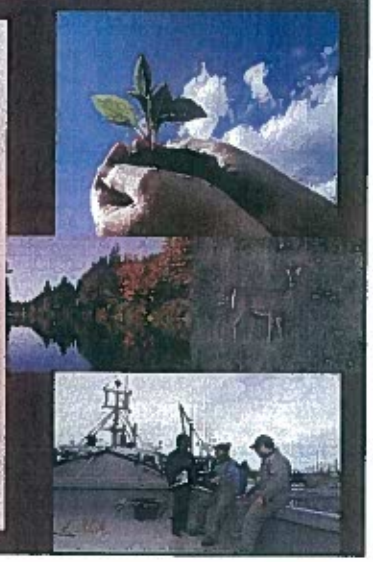
- **Safety**
- **Informed, willing** community; Focus on 4 nuclear provinces
- Communities **choose to participate**
- **Respects Aboriginal rights and treaties;** will take into account unresolved claims between Aboriginal peoples and the Crown
- Recognizes **unique status of Aboriginal peoples** under S. 35 of the Constitution Act (1982)
- Recognizes **unique stewardship responsibilities and the value of Traditional Knowledge**
- Recognizes the **long-term nature** of the project
- **Inclusiveness** of the views of others, including those along possible transportation routes
- **Partnership-based** approach
- Foster long-term **community well-being** in the host community
- **Shared decision-making** with potential host community

What is the process?



Proposed Site Selection Criteria

- **Ensure technical safety- to protect humans and the environment, now and in the future:**
  - Progressive and thorough site evaluation process
  - Comprehensive technical site evaluation criteria
- **Beyond technical safety – to foster the well being of the community:**
  - Socio-economic criteria to assess the potential effects of the project on the community
- **Include factors identified by Traditional Knowledge**



Aboriginal Traditional Knowledge

Engagement of Aboriginal peoples will take place supported by agreements which will include resources to:

- support capacity to participate
- conduct independent research which builds on Traditional Knowledge
- develop culturally appropriate communication materials

Process is designed to recognize importance of Traditional Knowledge that stems from long contact with the land and developing and maintaining meaningful relationships between generations and within and between communities

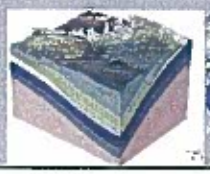
NWMO will ensure that Aboriginal intellectual property is protected, as agreed

Technical Safety Evaluation Steps

» **Initial Screening (several months)**
- Assess whether the site meets a minimum set of criteria in order to enter the siting process (initial screening criteria)
- Use of readily available information

» **Preliminary assessment (1~2 years)**
- Assess potential suitability of the site to safely host the repository
- Review and analyze available technical information
- Possibility of limited field investigations

» **Detailed Site Characterization (~ 5 years)**
- Conduct detailed site investigations to confirm suitability of the site
- Geophysical studies; Boreholes drilling and testing, laboratory testing
- Safety analysis etc.



Proposed Initial Screening Criteria

Initial Screening Criteria:

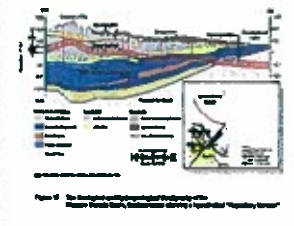
» Enough land to accommodate surface and underground facilities

» Outside protected areas, heritage sites, provincial/national parks

» Land must not contain groundwater resources at repository depth

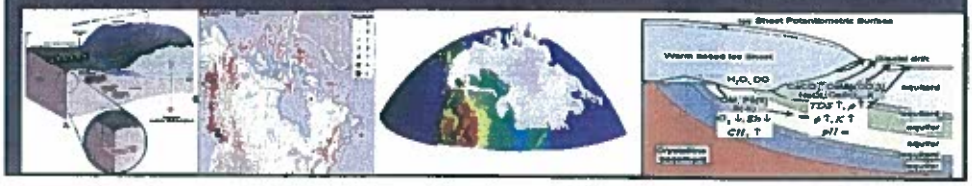
» Land must not contain known economically exploitable natural resources

» Land must not be located in areas with known geological and hydrogeological features that prevent site from being safe



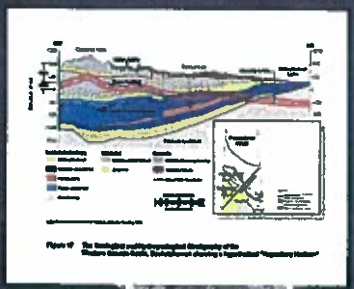
Proposed Technical Site Evaluation Criteria

- **Containment and isolation characteristics of the host rock**
  - Sufficient depth to isolate the storage from surface events
  - Low groundwater movement
  - Favourable chemical composition of the rock and water at depth
  - Favourable thermal properties
- **Long-term resilience of the site to future geological processes and climate change**
  - Resilience to earthquakes and other geological processes
  - Resilience to climate change effects (e.g. Glaciation)
  - Stable characteristics of the rock and groundwater



Proposed Technical Site Evaluation Criteria

- **Isolation from future human activities- Prevent human intrusion**
  - Avoid areas containing economically exploitable natural resources
  - Avoid areas containing exploitable groundwater resources at repository depth
- **Site amenable to characterization and data interpretation activities**
  - Simple and predictable rock geometry and structure
- **Safe construction, operation and closure of the repository**
  - Rock has sufficient strength to ensure stability of underground openings
  - Soil cover depth should not impact repository construction
  - Sufficient area to accommodate surface infrastructure



Proposed Technical Site Evaluation Criteria

» Safe and secure transportation routes

- Transportation route exists or can be constructed to safely transport used nuclear fuel from storage sites to the central repository site
- Routes allows for security and emergency response measures to be implemented

Foster the well-being of the community

» **Evaluate the site against positive and negative social, economic, and cultural effects on host community**

» **Evaluate existing and potential physical and social infrastructure to implement the project**

» **Evaluate potential to avoid ecologically sensitive areas and locally significant features**

» **Evaluate potential to avoid or minimize effects of transportation**

Partnership & Community support

Communities choose to enter the process and proceed through steps

Joint development of terms & conditions of participation between community & NWMO

Resources provided to support decision-making

- Conduct a community visioning exercise – identify a long-term plan for well-being and sustainability
- Seek independent expert advice about the project and the evaluation results
- Inform residents, assess interest, demonstrate willingness

Partnership & Community support

Involve surrounding communities, region and affected Aboriginal governments as early as possible

Involve community members as early as possible

The siting process will respect Aboriginal rights, support Aboriginal engagement, and include Aboriginal Traditional Knowledge shared with the NWMO

The NWMO will continue to foster ongoing public discussion

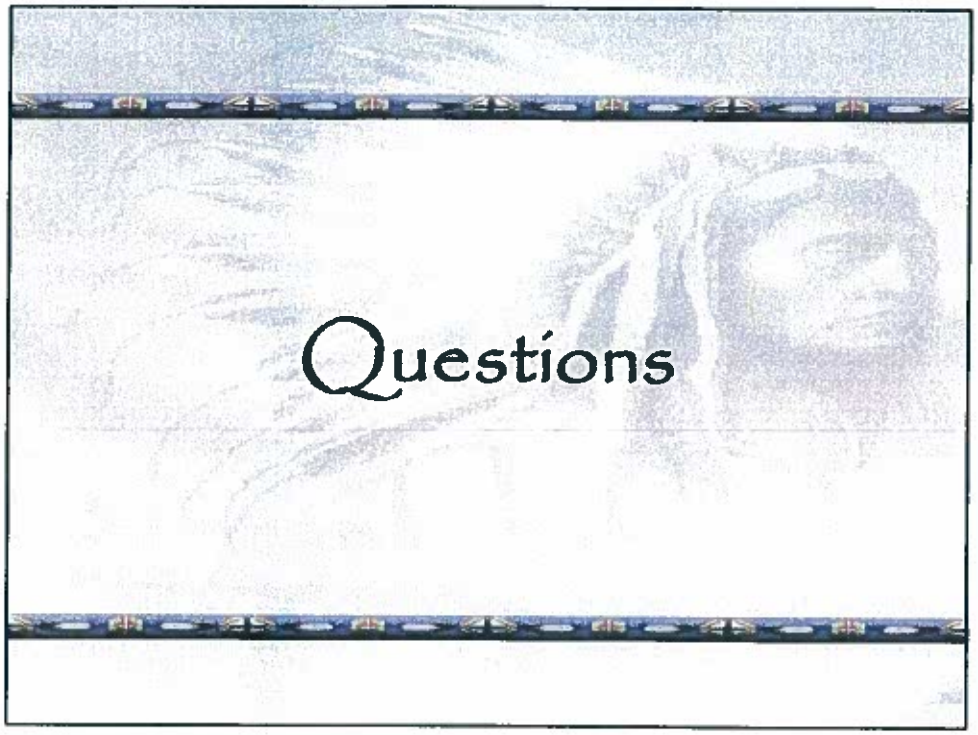
Transportation route communities invited to raise questions/concerns

Nuclear Waste Management Organization- Status

- 2008
- Dialogue about principles & key elements for a site selection process
- May 2009
- Took input and developed and published *Proposed Process for Selecting a Site*
- Now
- Seeking comments from Canadians and Aboriginal people on the proposed process
- Late 2009
- Refine Site Selection Process in light of comments received
- Post 2009
- Process for selecting a site will be initiated

Summary

- In 2009, NWMO is continuing work on the ***design of the process*** for site selection.
- NWMO is developing the site selection process in a collaborative way, with interested individuals and organizations.
  - Public engagement in 2009 will invite discussion and comments on a *proposed (draft)* site selection process.
  - Dialogues in 2009 will continue the collaborative discussion that was initiated in 2008.
- NWMO has ***not*** begun the site selection process.
- The site selection process will only commence after such time as the process for site selection has been confirmed and finalized (after 2009)
- The Union of New Brunswick Indians will host information sessions in the First Nations communities in New Brunswick - Fall 2009
- We encourage you all to attend these sessions and provide feedback for this process.


Questions

Nuclear Waste Management Meeting

Fredericton Inn

July 15th 2009

10:00 – Opening prayer

Pat Patton from NWMO (director of aboriginal relations) – overview of what meeting would include:

- Video about elder's forum, how they've been giving advice and helping over last 4 years.
- Proposed process regarding how to select a site

VIDEO

Donna (elder) – about elder's forum first meeting, liked the forum because there were no pre-set notions or standards. First thing they did was have a meeting where everyone voiced their opinions so everyone could get their thoughts out there from there they met again and again and started to get to know each other. From that they all decided among themselves to form a working group that would meet and keep in touch this led to a ceremony where an elder thought of the idea to call it "Nigami" meaning to lead the way. Planned out how they would operate. Important to them to ensure all their people were informed about this topic. None of them claimed to be experts on the scientific aspects of this and they were not experts on how the fuel bundles were made. Right from the start NWMO made them feel as though they were involved and included and felt they really were listened to. Listened to their plight and acted upon it. At their first meeting a lot of elders were not sure about the idea and wondered what they were doing there because it was something that was supposed to last a long time. However, they got to meet with the board and had the opportunity to be very involved and they asked them to be very honest with them because often times people will say they'll do one thing and do something totally different. The board really listened and didn't get offended and they are working together. When native people make decisions they have to think about how those decisions will affect seven generations. Therefore, they got youth involved in the forums as well. They have 5 youth and 5 elders on the forum. How can we expect our children in the next generation to learn anything

if we don't bring them with us? They have all had training from the scientific point of view. There has been a strong push from the elders to honour their treaty.

Gwen (elder)-

Involved in the forum for a few years, was asked to participate because of background and involvement with the environment. From the perspective where you've got the idea that nuclear energy is something to be avoided. Remembers an elder saying they should have never taken uranium out of the ground because it served a purpose there and that's where is should have stayed. Trusts the people she has met has learned a lot of technical knowledge, the way mother earth made the uranium not lethal was by it being covered by copper and clay which is one of the ways they are planning on putting it in the pellets and the ground. They are using the method that mother earth created to store the nuclear waste. Still a lot of people are very concerned. Mission statement and guiding principles have been followed by NWMO. There moving into the community now to really educate members of the community so that they are not learning there information by word of mouth from others. They never know where there knowledge is going to come from it could be from a child; sometimes children have the best ideas. Youth need to be involved because it's them that are going to be making these decisions and it's their futures that are going to be impacted.

Norville Getty- Explains what nuclear waste is low- level (wearing clothing were using tools that get radiated they have to be put away and destroyed). High-level nuclear waste is fuel bundles which are basically what they are talking about today. Talks about how nuclear waste bundles are stored at point lepreau (concrete bunkers).

Pat Patton summarizes : In the video we talk about how the energy is produced and what our motive is on the storage of high level waste. It explains the process by which we pick a location for the deep geological repository for the high level waste, and there are other kinds of waste are managed in similar ways and depend on the level of radioactivity. This process is managed by a significant amount of time. I would like to thank Norville, Ron, Kyle and George for touring point lepreau yesterday so their recollections are very accurate on how exactly nuclear waste is managed.

QUESTION & ANSWER PERIOD

Q: Darrel: It seems that in nuclear waste there is still a lot of energy there is there anything that is being developed to see if there is anything can be made out of nuclear waste? Is this something that is currently being done, or do you plan to do?

A: OUf: Different reactors use different fuels for example a truck can be either diesel or gas. Although uranium is the primary fuel for all power generators and nuclear reactors, but CANDO (Canadian reactors) designed for natural uranium which means that we can essentially take the uranium that is mined out of the ground and form it into pellets and put it into our CANDO reactors. The U.S and other countries used enriched uranium and modify natural uranium. Within natural uranium it has natural background radiation therefore it contains radioactive particles. Also you can hold natural uranium in your hand and it wouldn't harm you. In reactors that use enriched uranium they take all of the non-radioactive uranium out leaving you with a high percentage of radioactive uranium in the actually fresh fuel. That type of fuel is more readily reusable than the Canadian natural uranium for economic reasons. In order to split it up you have to take out the stuff which you can reuse, and take out the stuff which you cannot reuse and turn into vitrified waste is not economically feasible for Canadian type of uranium. However other countries do it the U.S does not but France, England, and Japan do recycle their uranium fuel. The concerns with reprocessing it creates weapons grade plutonium, because this is a by product although it is not wanted it is what is created. Which then creates other issues with the uses for this weapons grade plutonium, it then posses a security risk. The U.S has essentially expressed disinterested in reprocessing this weapons grade plutonium. The current technology is very expensive in the reprocessing of uranium, so therefore the payback is very little. One of the key features of the PGR is retrieve ability, the public has addressed concern whether this waste will be retrievable if technology comes up and renders what we consider 'waste' now as a valuable resource. This is why we built into our waste management plan the option to retrieve this waste.

Q: Darrell: Just from that statement alone were you say it is not economically viable, that the returns are small and it is very expensive. If a cure was going to implement just think of the millions and millions of dollars that are being raised now for cancer, it would have an impact on the medical researchers, pharmaceuticals, doctors, either directly or indirectly. The reprocessing of waste would have a huge impact on the economy because it would have a cost affect within that medical area. In comparing this to nuclear waste there must

be something there that definitely be used for a medical project or advantage. So it then boils down to the statement its health versus wealth, and in most cases wealth comes before health. For example the pesticides and insecticides they spray on crops have a direct link to the sickness and illness which we face today. But if they were to cut all that out and look at the affect it would have on the economy a lot of jobs will be lost. It's the impact on the economy that's going to take precedent over everything.

A: Pat: In this case the impact, in the reprocessing cycle you can remove the reusable portion of uranium that can be prefabricated. With the plutonium you also still end up with a lot of material that is still radioactive and you also end up with a lot of chemicals that also need to be safely disposed. Vitrified waste, they call it vitrified because it's encased in black glass, looks like a black glass box. That material is also radioactive and this also has to be put into big storage canisters. The outcome is that you have less of the waste but you still have highly radioactive waste but you've also got reusable uranium. Still going to have to go into the geological repositories so economically that's still going to go on, its not going to change anything but you are creating more work, so it's almost the opposite of what you're saying. The solution economically cannot be something driven by a wish to reduce the work that is being done, all work will still have to continue. Our work will still have to continue in order for these reactors to operate. Our fuel bundles have a lot less reusable fuel energy so for the moment as long as natural uranium is available to fabricate the pellets it makes for a much more economical use of our reactors. We do know at some point in the future it may get more and more difficult to find sources of energy and the waste which we have may have to be reprocessed but that may not happen for many years. There are studies going on right now which can be called partition and transportation. These are two forms of studies they are trying to find a way to separate the radioactive element and the isotopes and neutralize waste so that it will be less radioactive. It is anticipated this will take another 50 years before we know whether it can be done successfully. Experts came to the conclusion that we can't wait 50 years because the material continues to be produced and waste continues to be produced so we need to do something now. It is going to take about 30 years before we actually construct a repository plan, by the time we go through the process of meeting with communities, site selection, go though the regulatory process, and then begin construction. This can take a very long time, but our generation needs to make a decision now.

Q: Darrell: Speaking of economically viable governments are notorious for spending money inappropriately, for example how economical is spending 25 million to get only 300, 000 dollar profit, how justifiable and economical is this? If other countries are so keen on reusing nuclear waste then why are they doing?

A: Pat: Japan for example has no natural resource of uranium, so they determined that is more economical for them to reprocess their waste. By bringing their waste to back to Japan and reusing it in their reactors they do it because they have no other resource of natural uranium.

Darrell: This country is costing too much to reprocess, but yet a country like Japan will reuse their waste, and if is economically appropriate for them then why not us?

Ouf: Part of this is the technical differences, between natural uranium fuel and enriched uranium fuel, and what you can do with one doesn't necessarily mean you can do with another. The other factor within this is that Canada is a very large producer of uranium and so it may simply be easier for us to use natural uranium that we dig up in our own back yard then it would be to start a very toxic reprocessing site. Because the reprocessing of fuel is a very toxic and dirty job, there are a lot of environmental aspects to it. If this process was clean then Canada would be for it, but why introduce a cycle that creates even more headaches and costs for a very small gain. So why would you undertake that for a small penny, when you got abundant resources in your back yard.

Pat: The reprocessing that creates plutonium is also a big factor in the decision making in Canada. We have an international agreement which states we will not use our resources for weapons grade plutonium.

Q: Darrell: If enriched uranium poses more of a risk as apposed to natural uranium poses less of a risk why would they have chose to do this?

Ouf: It could be the design cycle, the CANDO reactors design is much newer then some of the light water reactors. It might have been something they discovered after the original design stages. There are many ways of doing something, and sometimes something that is simpler is not as obvious of its complexity.

Pat: The rational of other countries design for their nuclear reactors differ from the Canadian CANDO reactors. Cando reactors are specifically designed for Canada's situation; it is a very efficient reactor. It is simple and safer reactor and

as a result of that deals with natural uranium. On our website this is one of the areas that we keep what we call 'watching brief'. Within reprocessing and partitioning in transportation we participate with other countries in doing that. In order to keep aware of how it might impact the design of a future repository. Also each year we post a report on our website to watch and see what is going on in the world, and whether it has an impact now on our work. At whatever time in may have an impact a report will come out on how it may changes either the design of the repository or the work we will be doing. If you go to our website we post all reports that are written for us, if you look under adaptive phase management there will be section called technical section and documentation. All of the technical documents we do come up.

Q: Darrel: Have you or not targeted any areas for the site selection?

A: Pat: We have not targeted any areas, nor looked at any sites. The part of the process that is very important how we go about this, the location must be willing and informed community. We are not accepting any forms of interest at this time, and we won't until we go through this process this year of getting input and releasing the document next year. At which time those whom are interested can come forward, which they will have no commitment whatsoever on that area, but just as an interest to learn more about it before they go into a process. Therefore no we did not target a site anywhere.

Q: George: The big question is the consequences of moving this waste from one place to another, and whether there is any concern for safety while doing so. What process would take place in transporting this material from Saskatchewan and other reactors to this repository site?

A: Ouf: When we are talking about Saskatchewan this province holds the abundant source of natural uranium. Natural uranium has very low level radiation profile, which means you can mine it buy hand and also transport it in trucks that look no different then any other trucks. This natural uranium is inheritably dangerous but once put into the reactors then it is toxic. However it is solid, not a liquid making it much easier to transport without the danger of spilling. The only danger may be encountered is if the solid was to break apart. Uranium fuel is encased in zirconium cubes which are welded and that is placed into storage for transportation into a repository years from now. These waste which is safely encased has high levels of radiation which is toxic to us, however because it is safely managed within this storage package you can stand next to it without being harmed. There are very robust regulations that specify the safe

regulation limits and temperature limits on the outside of packages. To ensure that workers, public, and the environment are safe. The storage containers are tested through accident conditions to ensure that if there is a transportation accident that this is no release of the radiation.

Q: George: If this product so safe then why couldn't we just store it anywhere, why does it have to be stored in an underground facility.

A: Ouf: In terms of transportation is the lengths of time that fuel is suppose to be dangerous transportation is only a blink of an eye. When talking about transportation aspect is short compared to the length that this material can be dangerous. The radiation profile of the fuel can last well over 100 000 years so we want to ensure that future generations will not be impacted on what waste we have accumulated today. Hence the repository design that we have been looking at. It is mandatory that his geological repository is utilized because how can we even predict what will happen 10 000 years from now.

A: Pat: One of the things that have been said all over the world is how the earth will protect the fuel bundles themselves. What we do know that the type of geology that we will be looking for in this project is geology that has been stable for millions of years. There is a study that shows that we can find stable rock in Canada, and has recommended either granite or sedimentary rock. That rock itself can be up to 5 million years old, and has been stable that whole time without any water flowing through it. We are designing a process by which we will be returning to the earth the canisters with nuclear waste, and encase them the way that the earth now encases natural uranium. Then the earth itself becomes its natural protection. In Canada we are very fortunate with the type of geology which is a good candidate for this deep geological repository. As you were questioning why we don't just leave it as it is, the repository is a 16-24 billion dollar project for Canada. In the large scheme of things Canada doesn't have a lot of waste currently we have 2 million used fuel bundles. Space wise it doesn't take up much space at all, if you could imagine 6 hockey rinks filled to the boards that is how much waste Canada has. Also we expect this to double to about 12 hockey rinks up to the boards, this is what we anticipate Canada needs to store.

Q: Brian: When we are talking about Japan using enriched uranium for their reactors, well why don't just ship our waste over to them, and let them reuse it. Also as for New Brunswick is our specific region overall stable, and a good candidate for this deep geological region.

A: Ouff: Canada itself is very fortunate position in comparison to other countries because of its good stable geology.

Q: When talking about transporting it throughout cities is there going to be some kind of safety regulation that warns that particular community that this nuclear waste will be passing through?

A: Ouff: In terms of radioactive shipment Canada has been shipping about a million radioactive shipments through Canada in one year. These shipments are mainly for medical isotopes, however many shipments have been made to and from Canada. Transportation is something that is done today and has been done for a number of years; millions of kilometres have been traveled in those shipments. So this proves that this has been done safely and still can be done safely. As to your question if the community will be informed, there certainly will be information available to what level needs to be decided by the government. At this point in time the governments have decided that this transportation information will not be made public, but however that will change. Currently Canada does not have any large scale transportations of nuclear waste however in the future this will change.

A: Pat: In this process we anticipate that it will be 30 years before we start to do big scale transportation, in that time regulations can change. One of the big steps we will take once we know were the site will be is that we will do an environmental assessment, which will include a licensing for transportation. So looking 30 years in the future we will begin this assessment 5 years prior. For example in New Mexico there is a regulatory process by which communities whom are surrounding the routes being used to transport nuclear waste, are part of a emergency preparedness planning program. That way those who need to know are highly aware of what is happening. Canada will have to be involved in a program similar as this, but not for another 30 or more years. Also New Brunswick will have to implement a program like this as well, due the transportation of waste from Point Lepreau.

Q: Peter: Just to clarify that there are 3 nuclear plants: one in Ontario, Quebec, and New Brunswick, and Saskatchewan is just the provider of the Uranium. Is there more of a liability on what Ontario stores, then apposed to our own province.

A: Ouff: Ontario produces over 90 % of nuclear waste. So the nuclear funding formula which was agreed upon by the government; is that each waste

producer has to pay a certain amount based on how much waste is produced. This goes into a segregated fund which is allotted to the NWMO to do the work on the DGR.

Q: Peter: It seems to me if Ontario is producing 90% of this waste then they should come up with the means to store it in the province which is producing the most amount of waste.

A: Pat: We are operating under federal legislation, this is a national issue and it doesn't have to go to Ontario. The key point to where DGR location is that the host community must come forth and be willing. For example if there are 2 host communities whom are interested and willing to host the DGR we will have to investigate both communities and whoever has the appropriate geology to host the DGR will be the one chosen. Whether it is in New Brunswick, Ontario, or Quebec. The question whether there is more of an onus on Ontario then other provinces, no there is not.

Q: Peter: Your assuming that one of the communities will come forward, what happens if nobody comes forward?

A: Pat: We don't have a plan B, so therefore we will keep on working and educate people better on this difficult issue.

Peter: I hope to see that this issue isn't left with New Brunswick to deal with the problems that Ontario and these big communities have created, because New Brunswick has not always been asked to be involved with such major decisions. I would hope that this isn't a burden we will have to deal with.

Q: Donna: You are saying that you will respect our lands, and intellectual property. These are any known burial grounds, or sacred traditional ground, but what about the elders who know about these sacred burial grounds and do not want to share there knowledge. Simply because they are scared somebody will excavate and disturb our ancestors.

A: Pat: We will come to complications similar to this, but hope that we will be able to come to an agreement cooperatively. This is where we will refer to the technical aspects of the 9 steps of selecting a site, particularly to the screening process. When a community comes forward we would need to find the minimal criteria which needs to be met.

Ouff: While the design of the Deep Geological Repository is to find a safe stable granite or sedimentary rock, we don't want water movement or any earthquakes within the site. The depth the DGR is approximately 500-600 meters below the surface. Its about the height of the CN tower down under the surface.

LUNCH

Wrap-Up:

Pat: Once we know what potential sites are we will work directly with the aboriginal people to get a much better understanding of their traditional life for the area, so we can seriously understand were this facility should go so that it meets the needs of the people in that area. We will an agreement with communities in order for them to be involved; we support communities that want to conduct independent research. By doing this we will have to aid in the development of culturally appropriate material. What information we do have has to be explained in a way that people can understand. This video we did show you earlier took us over a year to translate it into English, French, Maliseet, and Mi'kmag. This is something Union of New Brunswick Indians and Nuclear Waste Management Organization will have to work very closely in order to concisely present this to the community within New Brunswick. We have hired two men: Kyle Nash and George Paul present this information to each community. We have been working very closely with the elders form along with some youth that have attended this as well, we are very appreciative for there input.

UNION OF NEW BRUNSWICK INDIANS

NUCLEAR WASTE MANAGEMENT PROJECT

UPDATED REPORT

SUBMITTED BY GEORGE PAUL

September 13, 2009

During the first week of September I made several attempts to schedule meetings with chief and councils of the six remaining Mi'kmaq reserves. School season has started and everyone seems to be tied up with that now. I called in on September 8th at the Madawaska First Nations band office and spoke with the chief to relay the message that I won't be attending there because I was sick.

On the 15th I made a trip to Fredericton to file in my August Report. I spoke to Ron Perley about my report and asked if my report was appropriate or sufficient. Ron pointed out that my travel report should include more detail and to include names of people that I have spoken with. He also made it clear that each community should submit a detailed invoice of expenses upon completion of a workshop. He then instructed me to line up a meeting in Red Bank for the 25th of this month, which I proceeded to do in the following days. I set up a meeting with chief and council of Eel Ground on the 22nd and presented the outline of the workshop. Chief George Ginnish and three of his councilors were present Joe Ward, Emerson Francis, and Ken Larry. After the meeting he said they would discuss this information with the rest of the councilors that couldn't be available then and that he would call me as soon as they had agreed on who would assist me in arranging the workshop on a later date.

September 23rd I conducted a workshop at Eel River Bar First Nations. Wenona LaBillois and Rebecca were my assistants there. Their elder Margaret LaBillois was present as well as their traditional representative who conducted the opening prayer, Earl LaBillois. The meeting here took place in the evening from 6: pm to 8: pm.

(See attachments)

Like the meeting in Buctouche the turnout was poor even though that we had flyers posted throughout the community a week before.

September 25th the meeting took place in Red Bank as planned. The meeting began approximately 10: 30 am with the Steering Committee of UNBI all present with representatives from Eel Ground, Councilor John Barlow from Indian Island, Chief Noah Augustine of Red Bank, Kyle Nash, myself, the two newly appointed elders, and a representative from Point Lapreau to give detail interpretation of how the CANDU Reactor operates and to answer questions about Nuclear Waste material and its process. Minutes of this meeting are available at UNBI by the Steering Committee.

Attachment

Minutes for Nuclear Waste Management Information Session

Eel River Bar First Nation, New Brunswick

6:00 pm- 8:00 pm, September 23rd, 2009

Attended:

Wenona LaBillois

Sheena LaBillois

Ashley LaBillois

Rebecca LaBillois

Margaret LaBillois

Anita Narvie

Kathy Pictou

Earl LaBillois

Earl LaBillois began with a smudge and opening prayer. He also spoke of our traditional values and healing our mother earth.

George Paul began his presentation with hand outs following a video from NWMO. He then went thru a presentation from UNBI and which explained more of the process which is taking place. There was then a period for discussion.

Questions:

1) Have any of the four provinces shown any interest?
   No, they are simply presenting the plan to all communities at this time.
2) Do they dig up the waste after a period of time?
   No they set monitors and store for life.
3) What is nuclear waste used for?
   We use nuclear energy every day, TVs, microwaves, lights ect. We use this on a daily base.
4) What do the reserves get out of this from NWM using our land?
   Any community and surrounding communities will receive training and job opportunities.
5) If they intend to use a piece of our land do we lose our rights to that piece of land? What kind of control do they hold?

If the land is sold to the company then there could be an option to purchase another piece of land.

6) What if the government pulls something on use and we lose the piece of land and can't repurchase other land?? We lose out on a lot.
That is something that chief and council needs to reassure and do their research before making such a step. Common sense, don't assume anything and you won't be disappointed.

NOT ANSWERED

7) Wouldn't it have to be in an inactive area? How can the facility stand other drilling and construction which could vibrate threw the ground?
8) How much shifting and vibration do they predict the facility can stand?
9) Why do they take the risk of transporting nuclear waste to one spot which entails them to travel great distance? This increases the risk of traffic accidents (heaven forbid) and limits only one province to benefit from jobs? How come they don't do this in each province? Is all because of the mighty dollar always looking for the cheapest way out?
10) Are our people guaranteed jobs?
11) How are the economic benefits to N.B than any other province?
12) When they speak of further research what kind of research does that entail?
13) When they speak of flexible design what does that mean? Is it so the storage can move with earth quakes ect?
14) How can one predict natural occurrence that could upset the storage system and cause a mass destruction?

UNION OF NEW BRUNSWICK INDIANS

370 Wilsey Road, Fredericton NB E3B 6E9 Tel: (506) 458-9444 Fax: (506) 458-2850 E-Mail: lobby@unbi.org

A.N.R.C. Meeting

Friday, September 25, 2009

Metepenagiag First Nation

Site Selection Process

Introductions around the Table:

Chief Joseph Knockwood, Fort Folly
Mr. Nelson Solomon, UNBI
Ben Peter Paul, Pabineau First Nation, Elder for UNBI
Corinne Lunney, Recording Secretary
Kyle Nash, UNBI
Kathleen Duguay, NBPower Point Lepreau
Chief Noah Augustine, Metepenagiag First Nation
Floyd Bernard, Proxy for Chief Joanna Bernard, Madawaska-Maliseet First Nation
Norville Getty, UNBI
Christine Boone, St. Mary's First Nation, Elder for UNBI
Ron Perley, UNBI
Kyle Francis, NSDC
George Paul, Metepenagiag First Nation, UNBI
Mr. Rick Perley, UNBI
Mr. John Barlow, Indian Island First Nation
Darrell Paul, UNBI, Chairman

The Chairman called the Meeting to Order at 10:10 a.m., with Opening Prayer by Elder Christine Boone.

The Chairman welcomed everybody.

Power Point Presentation:

Mr. Kyle Nash gave a power point presentation and stated that this is a site selection process for NWMO.

Mr. Nash then passed it over to Ms. Kathleen Duguay.

Ms. Duguay then gave a power point presentation on what is nuclear waste. She said just to put it in perspective, she brought one of the fuel bundles that they use in the reactors and passed around for people to see.

Chief Augustine asked how much energy would one of those produce?

Ms. Duguay said that would produce enough energy for an average home for about 100 years. She then continued with her presentation.

Question and answer period followed.

Mr. Nash then continued with his power point presentation.

Some discussion followed.

Ms. Duguay said she will try and get the answers to some of the questions that were asked and get back to either Darrell Paul or Ron Perley

Chief Augustine asked if it would be possible to take a tour of those facilities and Mis Duguay said yes.

Ms. Kathleen Duguay then invited the rest of the Chiefs to take a tour of Point Lepreau, but asked that the groups be in small groups of 10. We will need the names, addresses, phone numbers, your title and type of vehicle you will drive when you come through and 2 pieces of ID, one is a photo ID and if you don't have that with you, you won't permitted to enter and no cameras allowed and if you don't have any safety shoes, we will provide those on site.

Mr. Getty said he will work with Ms. Duguay to arrange these tours.

Mr. George Paul suggested to have follow-up workshops to expand on delivering information to everybody and asked would it be possible to get some funding to extend this process?

Mr. Darrell Paul said he will find out and will let him know.

It was suggested that Norville, Ron, George and Kyle work with Ms. Duguay and work on the schedule of events.

Meeting adjourned at 12:35 p.m.

Closing Prayer by Elder Ben Peter Paul.

Respectfully submitted by:

_____

Corinne Lunney, Recording Secretary

Aim of Course

The aim of this course is to provide an understanding of the CANDU fuel design, performance and operation, and how the fuel interacts with the interfacing systems. The course will be of great interest to the fuel designers, manufacturers, station operations, fuel channel and fuel handling system designers, safety analysts, performance and inspection staff.

Course Outline

This course will provide an overview of the CANDU fuel design, performance and operation, with a special emphasis on the systems that interface with it. Fuel, more than any other reactor components, interfaces with many different systems. This course is designed to enlighten those involved in fuel design and performance of the interfaces; and vice versa. The course will describe the design of the bundle, the detailed nuclear physics of its operation, the thermal-hydraulic performance, the fuel handling, fuel and physics of the reactor, the discharge and storage of the fuel.

Registration Form

NAME _____
(Dr.,Ms.,Mrs.,Mr.) (first) *(last)*

TITLE_____
ORGANIZATION_____
ADDRESS_____
_____
TEL: _____
FAX: _____
EMAIL: _____

Vegetarian meals? Yes ☐ No ☐

FEE STRUCTURE [All fees include GST]

CNS Member $730.00
Non-Member $835.00
Student $360.00

METHOD OF PAYMENT

CHEQUE ☐ (payable to Canadian Nuclear Society), or

VISA ☐ MASTERCARD ☐ AMEX ☐

_____ ___/___
CARD NUMBER
EXPIRY DATE

_____ _____
SIGNATURE
DATE

Mail, fax or e-mail form and payment to:

Mrs. Denise Rouben, Office Manager
Canadian Nuclear Society
480 University Ave., Suite 200
Toronto, Ont. M5G 1V2
Tel.: 416-977-7620 Fax: 416-977-8131
E-mail: cns-snc@on.aibn.com

HOTEL ACCOMMODATION
Hilton Garden Inn

Please make accommodation arrangements, if required, directly with the hotel (905) 829-1145. Special group rate of $124 + tax per night is available for course participants if booked before September 21, 2009. Refer to "CNS Fuel Technology Course" at time of booking.

CANDU FUEL TECHNOLOGY COURSE

Canadian Nuclear Society
Fuel Technology Division

2009 October 5-7
Hilton Garden Inn,
2774 South Sheridan Way , Oakville, Ontario

Course contact:

Joseph Lau
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GEH Canada
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CANDU Fuel Technology Course
October 5-7, 2009
Mississauga
Preliminary Program

Objectives of the Course

- **To provide the understanding of CANDU fuel design, performance and operation**
- **To foster the understanding of the systems that interface with fuel and the effects on performance**
- **To promote knowledge of fuel within the CANDU industry**

Day 1

08:00 **Registration**

08:30 **Opening Remarks**
Joseph Lau, AECL
Erl Kohn, AMEC-NSS

08:45 **Fuel Design Requirements**
Al Manzer, Cantech

09:30 **Design Overview**
Erl Kohn, AMEC-NSS

10:30 **Coffee Break**

10:45 **Design Control & QA**
David Bella-Boudreau, AECL

11:30 **Fuel Design Codes and Predictions**
Mukesh Tayal, AECL

12:15 **Lunch**

13:15 **Qualification Tests**
Krishna Chakraborty, AECL

14:00 **Specifying the Design**
Paul Chan, Bruce Power

14:45 **Coffee Break**

15:00 **Fuel Physics Within the Bundle**
Ben Rouben, 12 & 1 Consulting

17:00 **End of Day 1 lectures**

Day 2

08:30 **Reactor Fuel and Physics Operation**
Charles Olive, AMEC-NSS

10:15 **Coffee Break**

10:45 **UO_2 Refining**
Steve Douglass, Cameco

11:30 **Fuel Manufacturing**
Min Lee, GEC

12:15 **Lunch**

13:15 **Fuel Handling**
TBD, AECL

14:00 **Chemical and Material Environment**
TBD

14:45 **Coffee Break**

15:15 **Fuel Defect Detection**
Eugene Suk, AECL

16:00 **Advanced Fuel Bundle Design**
Ki-Seob Sim, AECL

16:45 **End of Day 2 lectures**

17:30 **Dinner Reception**

18:00 **Dinner**
Guest Speaker, TBD

Day 3

08:30 **Fuel Performance Assessment**
Steve Wadsworth, AMEC-NSS

09:30 **Post Irradiation Fuel Examination**
John Montin, AECL

10:30 **Coffee Break**

10:45 **Fuel Safety**
Samir Girgis, AECL

12:00 **Lunch**

13:00 **Fuel CHF/CCP**
Glen Harvel, UOIT

14:00 **Long Term Management of Canada's Used Nuclear Fuel**
TBD, NWMO

14:45 **Closing Remarks**
Erl Kohn, AMEC-NSS
Roman Sejnoha, Cantech

UNION OF NEW BRUNSWICK INDIANS

370 Wilsey Road, Fredericton NB E3B 6E9 Tel: (506) 458-9444 Fax: (506) 458-2850 E-Mail: lobby@unbi.org

Nuclear Waste Management Workshop Site Selection

October 15, 2009

Days Inn
Oromocto, New Brunswick

Nuclear Waste Management Workshop
Site Selection
October 15, 2009
Days Inn
Oromocto, New Brunswick

October 15, 2009:

Present:

Bernie Stuart, Madawaska-Maliseet
Brian Stuart, Madawaska-Maliseet
Elayne Saucier, Madawaska-Maliseet
Mr. Kyle Nash, UNBI
James Chandra
Kathleen Duguay, NB Power
Ed Genova, NB Power
Norville Getty, UNBI
Ulf Stahmer, NWMO
Pat Patton, NWMO
Nelson Solomon, UNBI
Elder Ben Peter Paul, UNBI
Mr. Tim Culligan, Eel River Bar
Mr. Kyle Francis, NSMTC
Mr. Darrell Paul, UNBI, Chairman
Mr. George Paul, UNBI
Elder Gwen Bear
Elder Donna Augustine
Mr. Ron Perley, UNBI

The Chairman called the meeting to order at 10:05 a.m., with Opening Prayer by Elder Gwen Bear.

The Chairman welcomed everybody.

Mr. Ron Perley mentioned that there was some information at the table and if anyone needs it, they can help themselves.

Uranium:

Mr. James Chandra then gave a power point presentation on Uranium.

Some discussion followed.

Break for Lunch at 11:45 a.m. Reconvened at 1:30 p.m.

Break for Lunch at 11:45 a.m. Reconvened at 1:30 p.m.

N.W.M.O.

Ms. Pat Patton gave a brief presentation on regulatory testing and showed a video.

Mr. Ulf Stahmer gave an explanation on the regulatory testing being done. He said they do a 9 metre drop test in the most damaging orientation, followed by a puncture test, followed by a fire test, followed by an immersion test. He also gave an example of the most damaging scenario. He also mentioned that these tests are in fact more severe than the real world conditions.

The Chairman asked how long do these casks last?

Mr. Stahmer stated that transportation is only temporary and any given trip is not going to take any more than a day or couple of days, a week or so, time is not a really factor, derogation of the packages is certainly not a factor in the travel time. However, OPG is using transportation packages that are over 20 years old in their transport of radio active materials at this point in time and what they have done is, they do annual inspection and once a package is older than 15 years, every 5 years they do very, very detailed inspections, where they go and look all the wells and they look for defects and they look for derogation and then if they find anything, they assess it whether it can be fixed or whether the packaging needs to be retired. So there are management programs in place to ensure that the transportation package is as good today as it was when it was brand new.

Some discussion followed.

Mr. Stahmer said the location of the site has a bigger bearing on transportation modes than the location of the fuel right now. We can't finalize any transportation plans until we know where the site is and so at this point in time, shipping is not our prime concern, but that could change depending on the site location.

Discussion followed.

Mr. Stahmer said this report is also available on our website.

Ms. Patton then showed a video on the future management of Canada's used nuclear fuel and adaptive phased management.

Some discussion followed.

Mr. Kyle Nash then gave a power point presentation.

Meeting adjourned at 4:05 p.m., with closing prayer by Elder Ben Peter Paul.

UNION OF NEWBRUNSWICK INDIANS

NUCLEAR WASTE MANAGEMENT PROJECT

OCTOBER REPORT 2009

BY GEORGE PAUL

- As per usual, during the better part of this month I had made several phone calls to First nation's communities that are part of UNBI and wait for their response to line up a workshop.
- On October 7th I met with Hanford Nye at Fort Foley to deliver information about the workshop and what it will entail. Hanford introduced me to a couple of staff members there who can help us set up the workshop on a later date. He then gave me a tour of Fort Foley and explained about some of their environmental concerns, especially their sacred sites and herbal medicine areas.
- We were called to attend a steering committee meeting on October 13, 2009, at Fort Foley to give an update of our activities.
- October 14th, 2009 traveled to Fredericton NB to meet with Ron Perley and discuss my September report and to file my travel claim for that month.
- October 15th, NWMO and representatives of the local NIGANI members were invited to a meeting arranged by UNBI at the Days Inn in Oromocto. This gave us an opportunity to give our updated reports to the national reps.
- October 27th, I conducted a workshop in Indian Island, attending were some staff members. (see attached letter)
- October 28th, Conducted a workshop at Fort Foley. (see attached letter)
- October 29th, Went to Fredericton to file my October report and to meet with Ron Perley.

A concern for all Nations

"Come and voice your opinions on this very important matter"

PLACE: The Annex Building at Red Bank

WHEN: November 4th, 2009

START TIME: 1: PM

END TIME: 4: PM

LUNCH WILL BE AVAILABLE

PRESENTOR: GEORGE PAUL

NWMO Meeting at Fort Folly First Nation on October 28, 2009.

In Attendance:

Wendy Knockwood, CHR
Hanford Nye, Alcohol and Drug worker
Tammy-Jo Knockwood – FV worker
Tina Milner- Financial Advisor
Jennifer Knockwood - Councillor

Discussion after Video Presentation included how important it is to have consultations with the aboriginal community.

Treaty rights and Land that will affects the rivers and lands will affect the aboriginal communities.

Questions about how many sites there are in Canada? Answer was one for Canada.

Employment opportunities in communication and technical support. Is there a recruitment process now and how can you get involved in that process now until the end point. Canadians accept and recognized the government to launch process.

Would like to have another session to allow more people to attend and discuss this issue once the word is out.

Note Taker

Co-ordinator

October 26, 2009

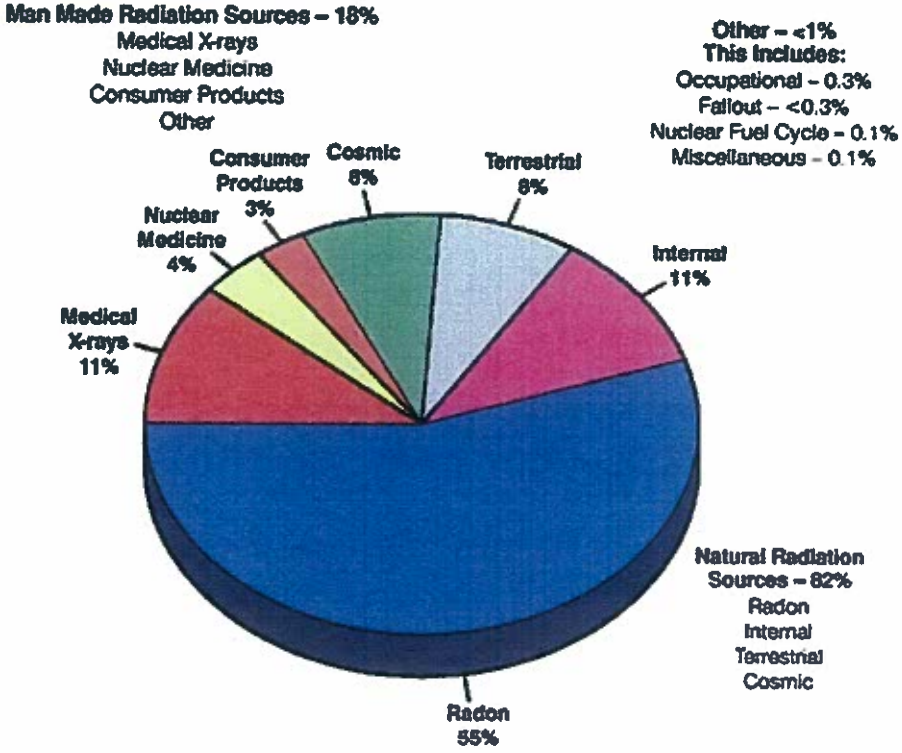
On behalf of the Indian Island First Nation, I would like to thank George Paul and the Union of New Brunswick Indians for delivering the NWMO presentation on the proposed nuclear waste facility. It was a very informative session and all who attended learned something about nuclear power and the handling of nuclear waste. We would like the opportunity to host another information session in the future as people who expressed interest couldn't make it on account of other engagements. Thank you for your time.

John Garfield Barlow
Economic Development Officer

URANIUM

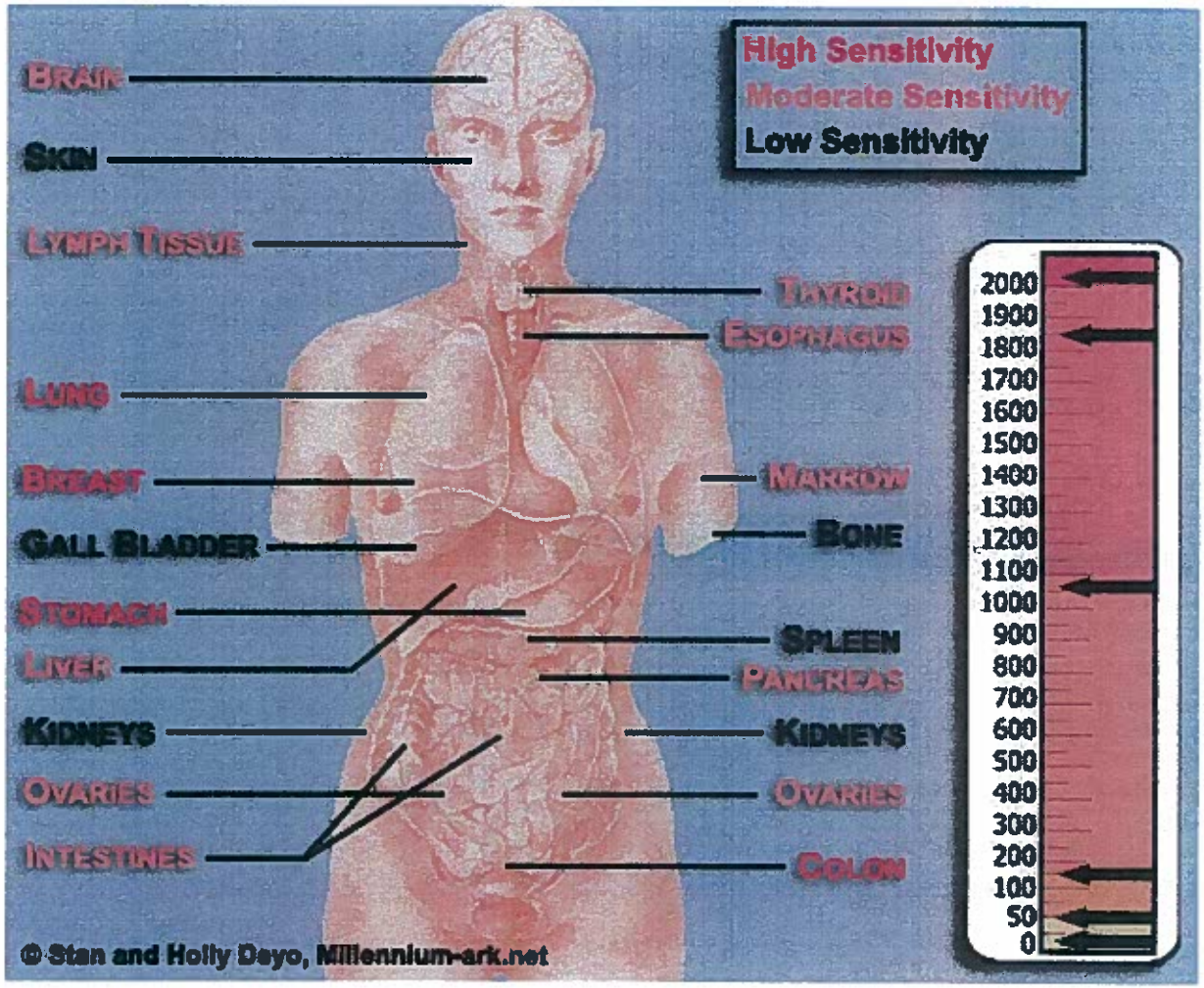
- What is radiation
- Health issues including Radon
- Uranium (U^{238})
- Sources of Uranium
- Searching for Uranium
- Canadian Mines
- Mining of Uranium
- Uranium – Fuel and Weapons
- Uranium in New Brunswick
- Questions

Ionizing Radiation Exposure to the Public



The above chart is taken from the National Council on Radiation Protection and Measurements (NCRP) Report No. 93, "Ionizing Radiation Exposure of the Population of the United States," 1987.

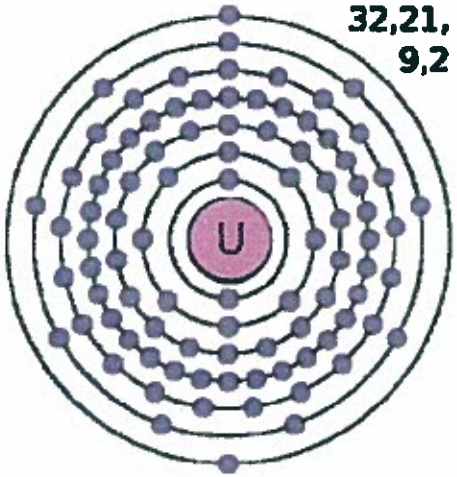
This chart shows that natural sources of radiation account for about 82% of all public exposure while man-made sources account for the remaining 18%.



"Rad" - radiation absorbed dose

UNBI

92: Uranium **2,8,18, 32,21, 9,2**



Pitchblende

(Containing the U^3O^8 oxides)

Atomic Number:	92	**Atomic Symbol:**	U
Atomic Weight:	238.029	**Electron Configuration:**	2-8-18-32-21-9-2
Shells:	2,8,18,32,21,9,2	**Filling Orbital:**	5f3
Melting Point:	1132°C	**Boiling Point:**	3818°C
Description :	Silvery-white radioactive metal. </TD		
Uses:	For many centuries it was used as a pigment for glass. Now it is used as a fuel in nuclear reactors and in bombs.		

238U with a half-life of 4.51 x 10^9 years, has been used to estimate the age of igneous rocks.

Early History of Uranium in Canada

Canada's foray into uranium mining began in 1930, when a prospector for *Eldorado Gold Mines* discovered pitchblende, a uranium-bearing mineral, on the shores of Great Bear Lake in the Northwest Territories, about 450 kilometres north of Yellowknife. The ore body was one of the richest known uranium deposits in the world.

At that time, radium, a radioactive decay product of uranium, thought to be a miracle cure for cancer, commanded prices as high as $75,000 per ounce in the 1930s. Uranium itself was only incidental and of no economic interest. So in 1932, *Eldorado* built a radium refinery in Port Hope, Ontario, 5000 km away from Port Radium, the mine on Great Bear Lake.

It took about 74 tonnes of ore to yield little more than 3 grams of radium. Dene men from the local community of Déline, the only inhabited community on Great Bear Lake, were hired to carry cloth sacks of radioactive ore to the shipping sites. The community later became known as a "village of widows."

U^{235}, while occurring in natural uranium to the extent of only 0.71%, is so fissionable with slow neutrons that a self-sustaining fission chain reaction can be made in a reactor constructed from natural uranium and a suitable moderator, such as heavy water or graphite, alone.

SOURCES OF URANIUM

Uranium, not as rare as once thought, is now considered to be more plentiful than mercury, antimony, silver, or cadmium, and is about as abundant as molybdenum or arsenic. It occurs in numerous minerals such as pitchblende, uraninite, carnotite, autunite, uranophane, and tobernite. It is also found in phosphate rock, lignite, monazite sands, and can be recovered commercially from these sources.

Properties

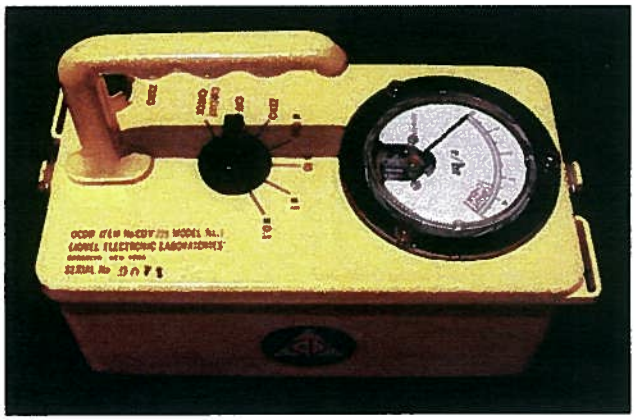
Uranium is a heavy, silvery-white metal.

It is a little softer than steel, and is attacked by cold water in a finely divided state. It is malleable, ductile, and slightly paramagnetic.

In air, the metal becomes coated with a layer of oxide. Acids dissolve the metal, but it is unaffected by alkalis.

U235, while occurring in natural uranium to the extent of only 0.71%, is so fissionable with slow neutrons that a self-sustaining fission chain reaction can be made in a reactor constructed from natural uranium and a suitable moderator, such as heavy water or graphite, alone.

Pegmatite source rock



Geiger Counter

A portable Gamma Ray Spectrometer

"Stripping Factors" used in calculating concentrations of eU
(equivalent uranium).

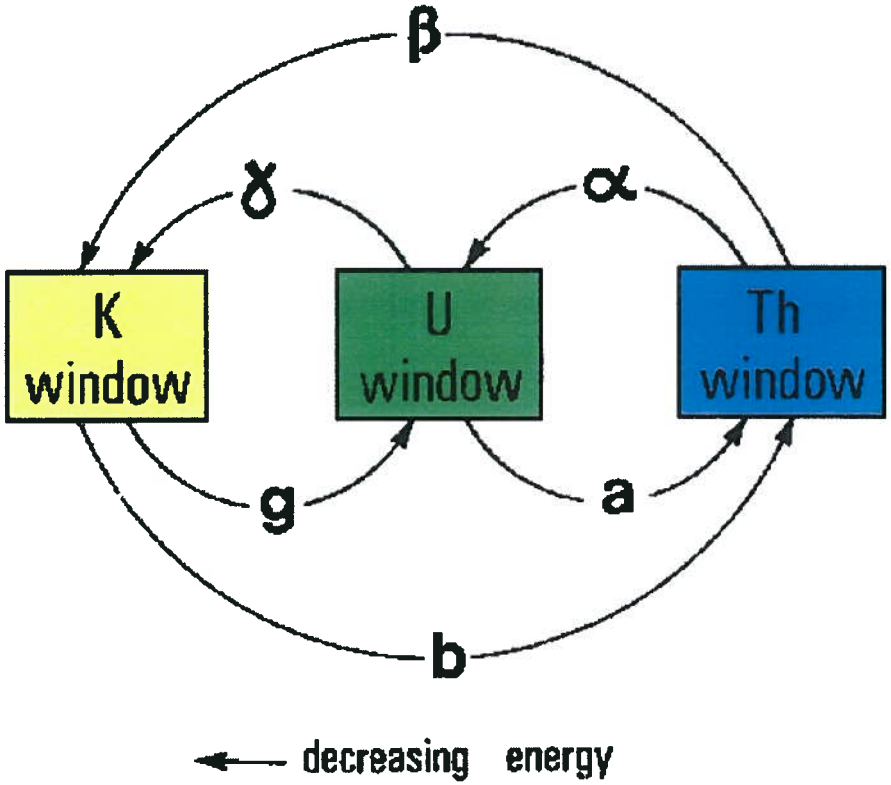


Figure 10C.15. Schematic representation of the interaction between the K, U, and Th energy windows indicates the stripping factors which are used to remove the interference denoted by the arrows. Commonly used stripping factors are α, β, and γ. The 'upward' stripping factors a, b, and g are generally small or zero and are often ignored.

The effect of topography in the mapping of uranium

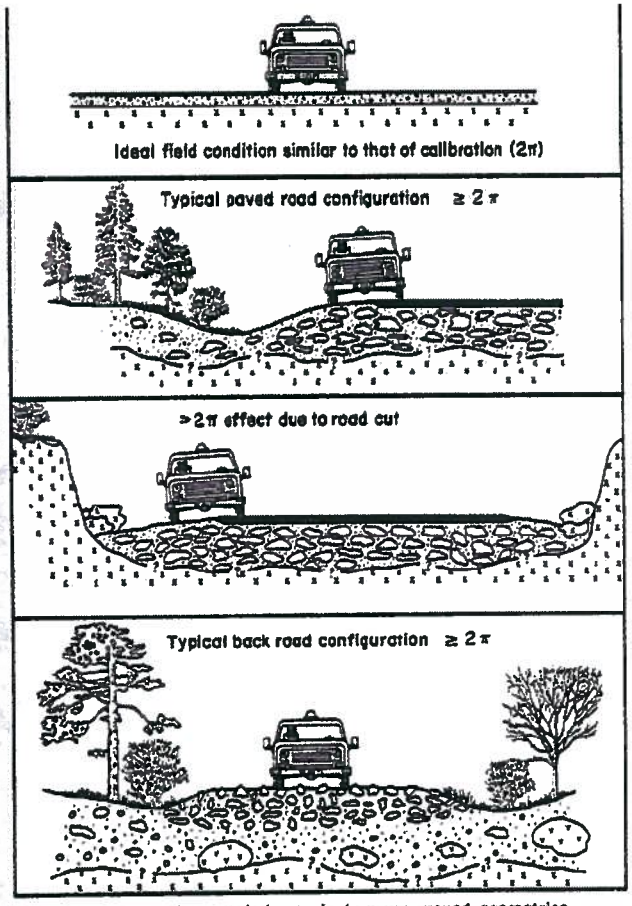


Figure 3.7. Illustrations depicting typical sensor-ground geometries.

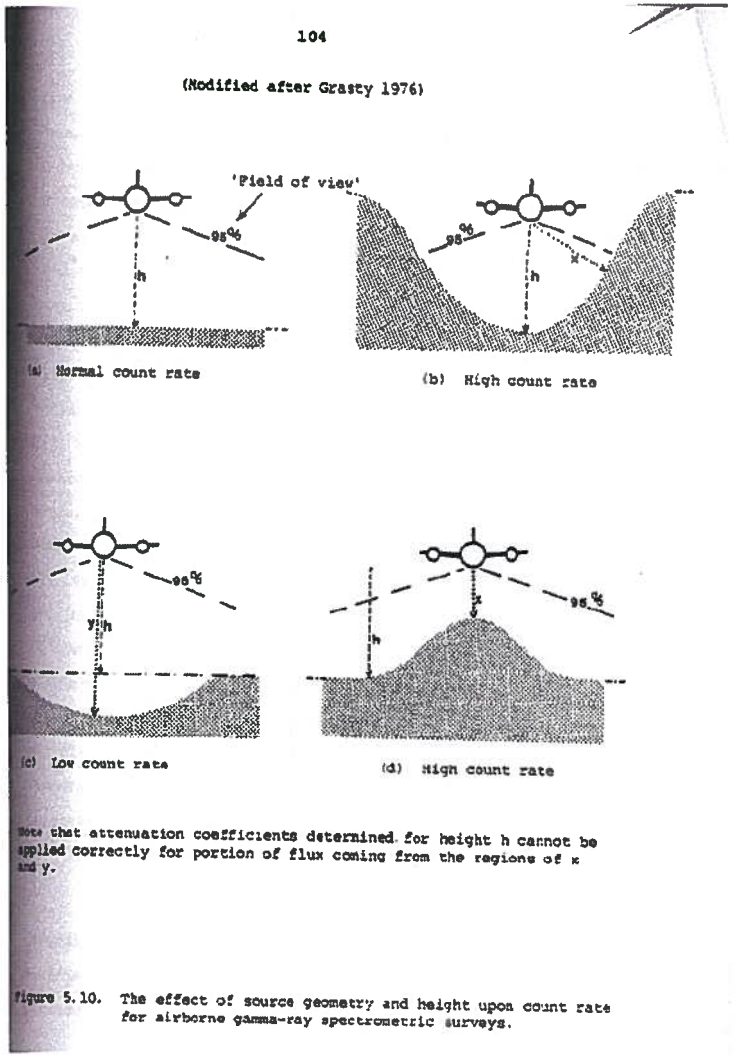
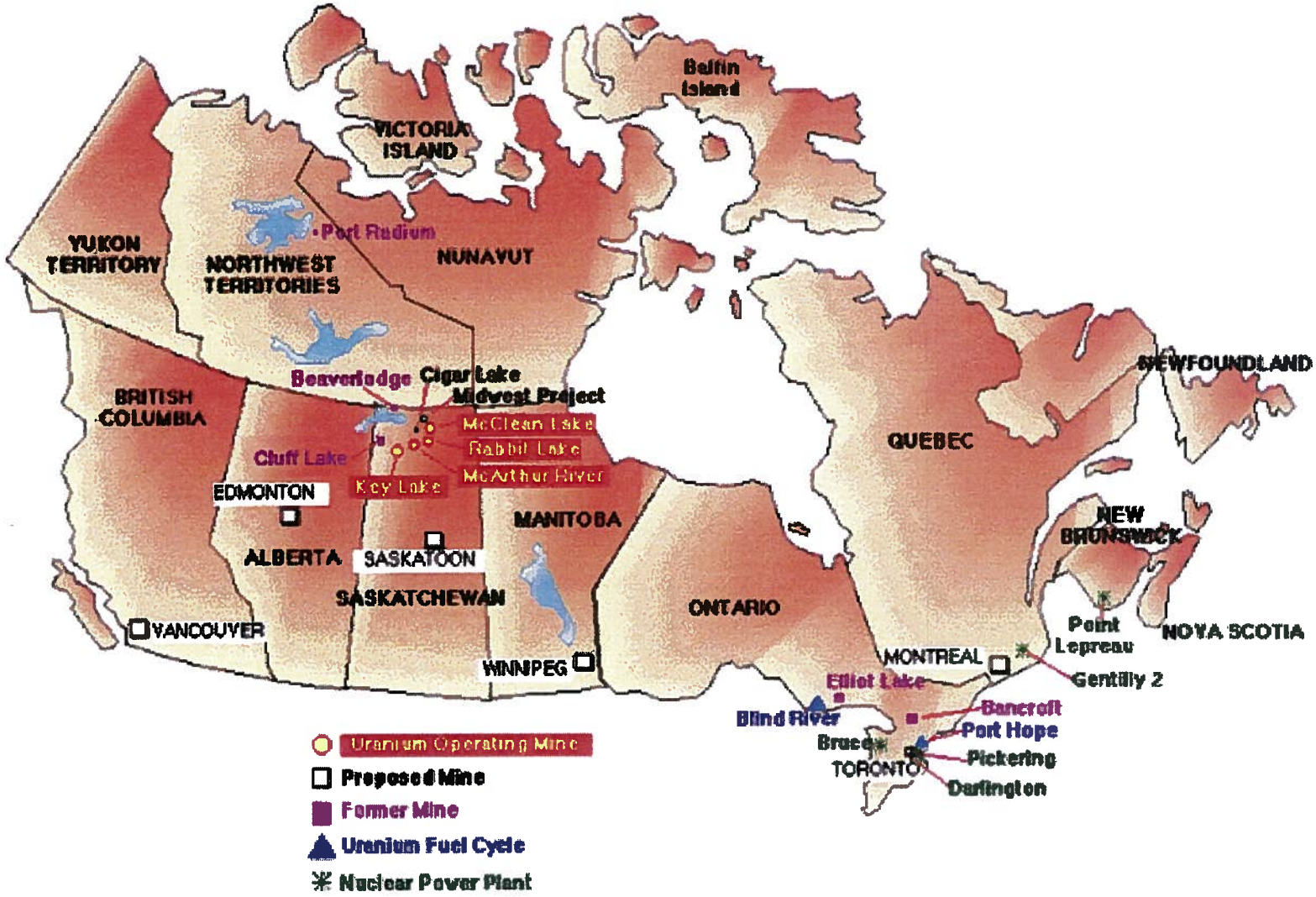
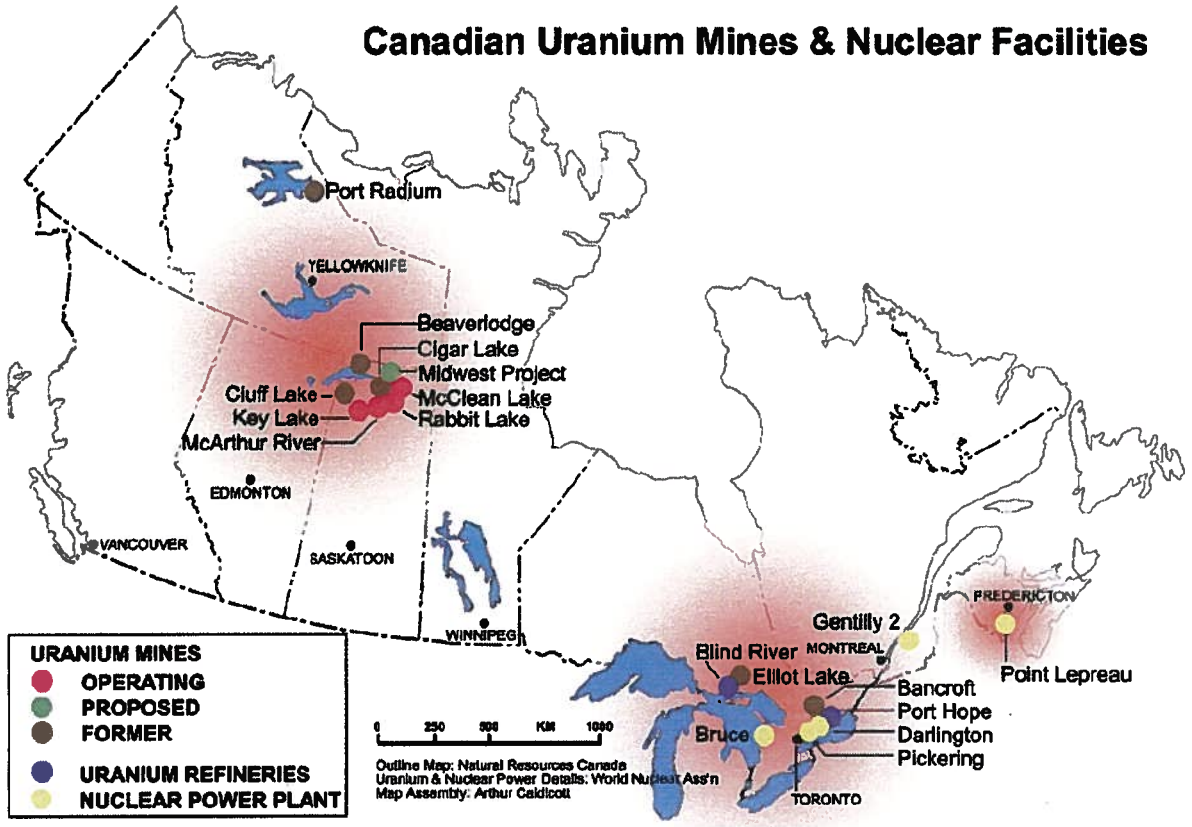
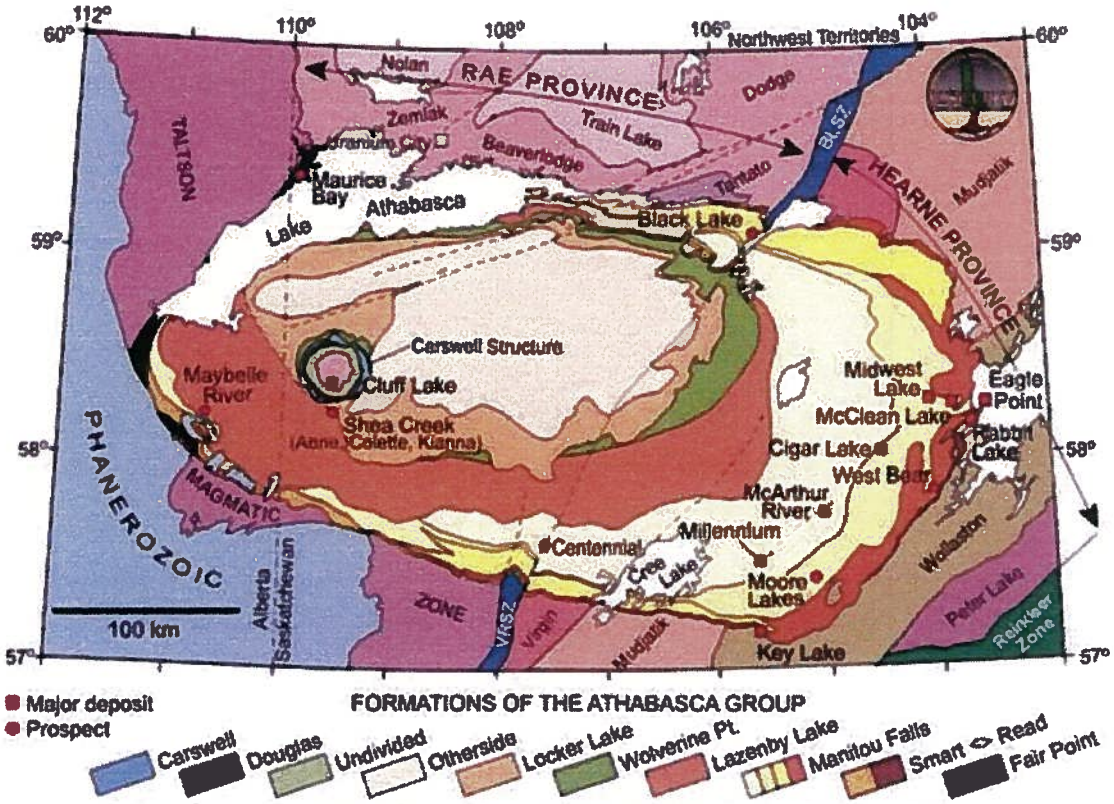


Figure 5.10. The effect of source geometry and height upon count rate for airborne gamma-ray spectrometric surveys.


Baffin Island
VICTORIA ISLAND
Port Radium
YUKON TERRITORY
NORTHWEST TERRITORIES
NUNAVUT
Beaverlodge
Cigar Lake
Midwest Project
McClean Lake
Rabbit Lake
McArthur River
Cluff Lake
Key Lake
BRITISH COLUMBIA
EDMONTON
ALBERTA
SASKATOON
SASKATCHEWAN
MANITOBA
QUEBEC
NEWFOUNDLAND
NEW BRUNSWICK
NOVA SCOTIA
Point Lepreau
ONTARIO
VANCOUVER
WINNIPEG
MONTREAL
Gentilly 2
Elliot Lake
Blind River
Bancroft
Port Hope
Bruce
Pickering
TORONTO
Darlington
Uranium Operating Mine
Proposed Mine
Former Mine
Uranium Fuel Cycle
Nuclear Power Plant


Canadian Uranium Mines & Nuclear Facilities
Port Radium
YELLOWKNIFE
Beaverlodge
Cigar Lake
Midwest Project
Cluff Lake
McClean Lake
Key Lake
Rabbit Lake
McArthur River
EDMONTON
VANCOUVER
SASKATOON
WINNIPEG
FREDERICTON
Gentilly 2
MONTREAL
Blind River
Elliot Lake
Point Lepreau
Bancroft
Port Hope
Darlington
Pickering
Bruce
TORONTO
URANIUM MINES
OPERATING
PROPOSED
FORMER
URANIUM REFINERIES
NUCLEAR POWER PLANT
0 250 500 KM 1000
Outline Map: Natural Resources Canada
Uranium & Nuclear Power Details: World Nuclear Ass'n
Map Assembly: Arthur Caldicott

Athabaska Basin

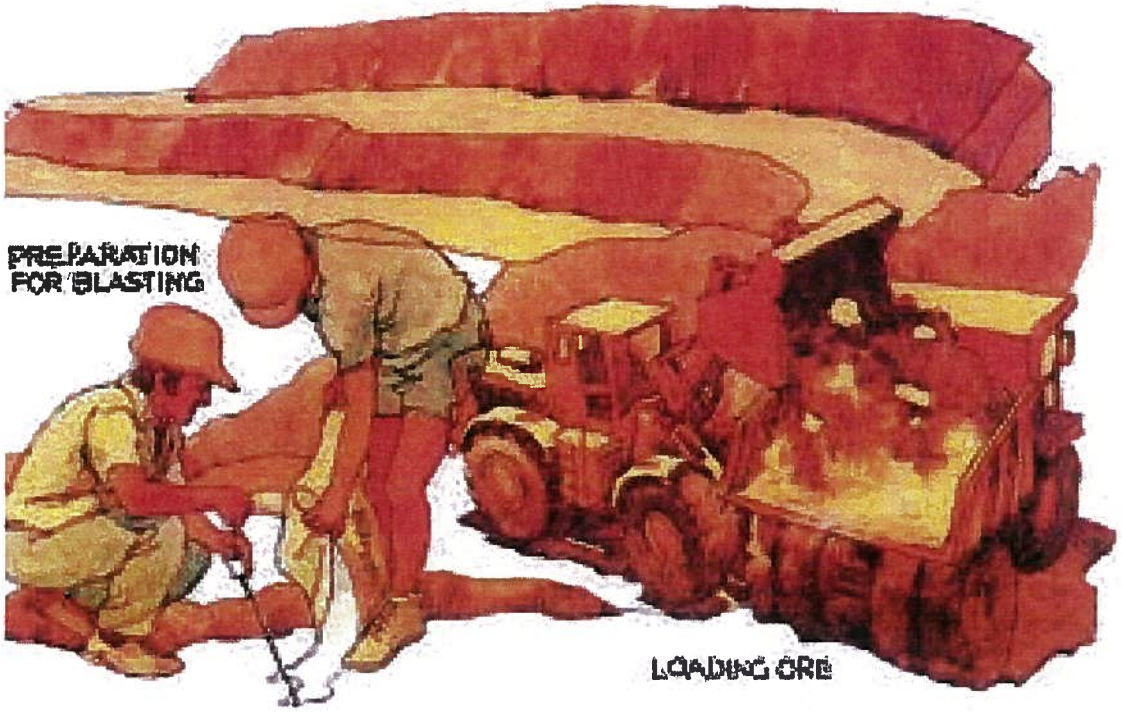


Some Uranium Occurrences in the Athabasca Basin, Northern Saskatchewan and Alberta.

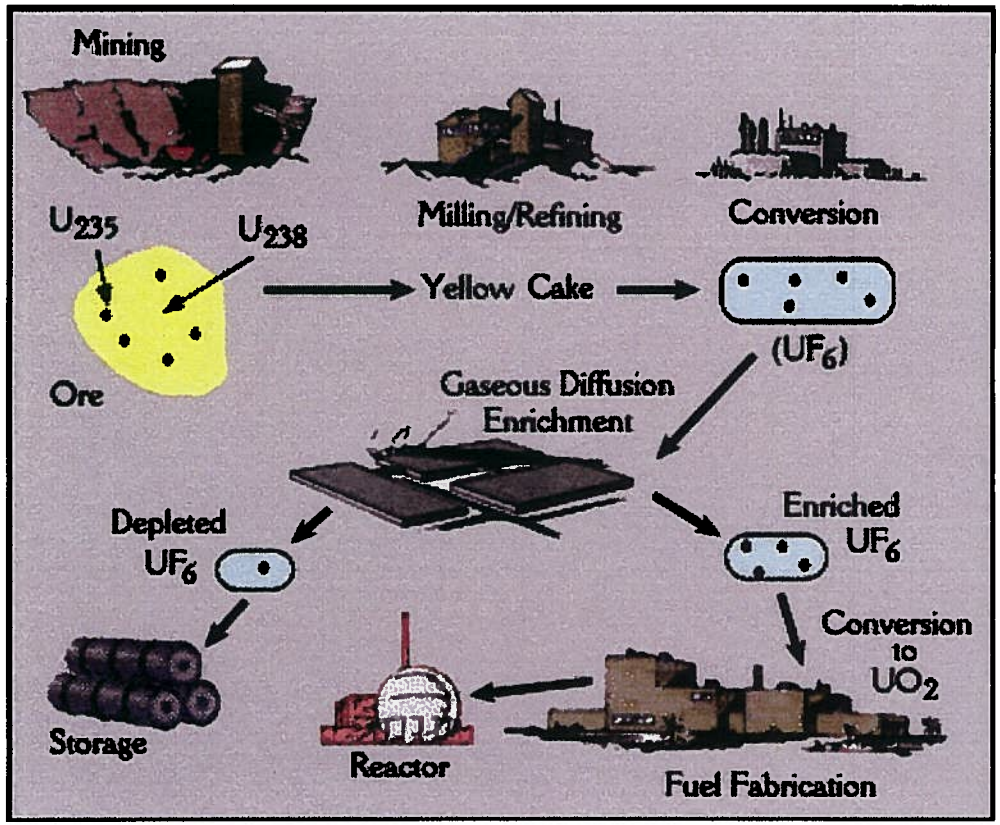
From the EXTECH IV Athabasca Uranium Multidisciplinary Study by Cameco Corp., AREVA, Saskatchewan Industry and Resources, Geological Survey of Canada, the Alberta Geological Survey, and the universities of Saskatchewan, Regina, Alberta and Laurentian

Cluff Lake Uranium Mine

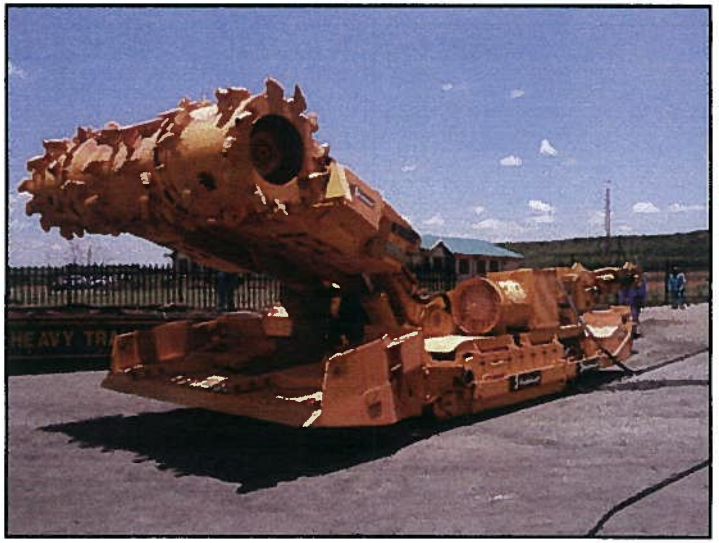
AREVA Open Pit and Plant


PREPARATION
FOR BLASTING
LOADING ORE

URANIUM MINING & PROCESSING

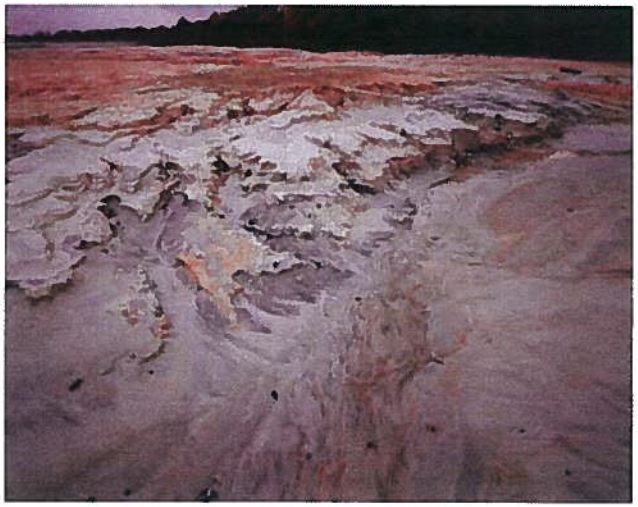



CAT



URANIUM TAILINGS

Moab, Utah



Elliot Lake

Cluff Lake

Khujdzan, Tajikistan

URANIUM VALUES	
200,000 ppm* U	High-grade orebody - 20% U
1,000 ppm U	Low-grade orebody - 0.1% U
4 ppm U	Granite
2 ppm U	Sedimentary rock
1.4 ppm U	Average in Earth's continental crust
0.003 ppm U	Seawater
*ppm = parts per million	

MILLING:

Uranium ore (U^3O^8 plus impurities) is crushed and soaked with sulphuric acid to leach out the U^30^8. When dry it is powdery and yellowish and commonly known as "yellowcake."

CONVERSION:

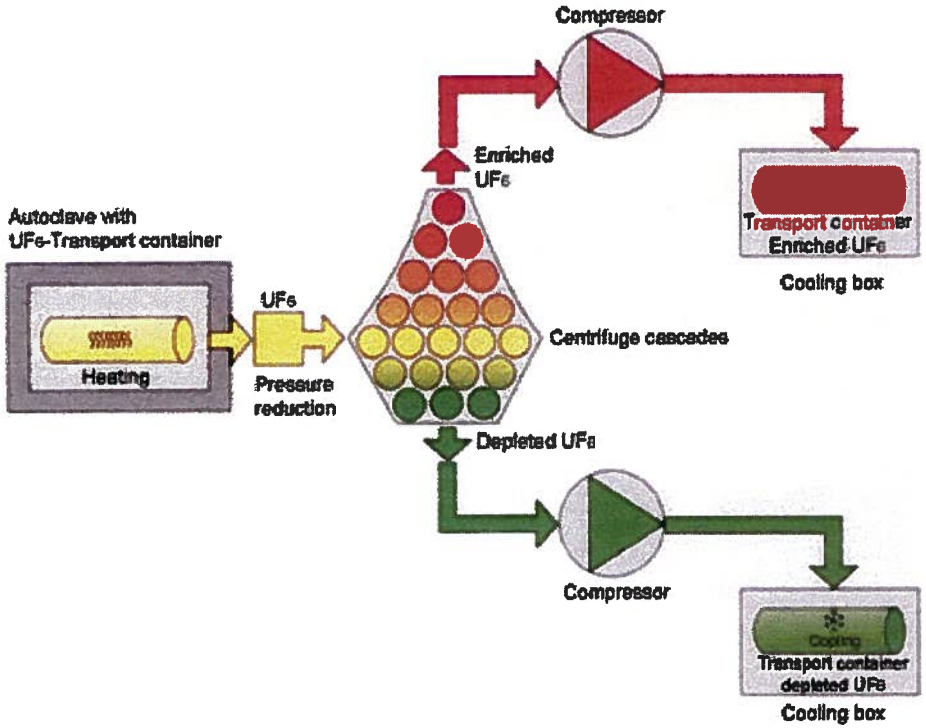
Because uranium needs to be in gaseous form before it can be enriched, the yellowcake is heated to about 147 degrees Fahrenheit, at which point it is converted into **uranium hexafluoride gas (UF6).** This compound is corrosive to most metals (but only mildly to aluminium), highly toxic, and violently reactive with water.

Uranium Hexafluoride (UF6)

ENRICHMENT

- The UF6 gas is pumped into a centrifuge that spins on an axle **at the speed of sound**, creating artificial gravity.
- The slightly heavier U-238 moves to the outside of the tube while the lighter and highly fissionable U-235 concentrates toward the center of the tube, where it is collected.
- This enriched **U-235** continues to be fed into a chain of other centrifuges, a process known as a cascade.
- The enrichment process removes about 85 percent of the U-238 by separating the UF6 into two streams.
- Both streams are still primarily U-238 but one stream has a lower concentration of U-235 than the other.
- The stream essentially containing U-238, with all the U-235 removed, is referred to as depleted uranium, tails, or waste; it is stored in steel cylinders, each containing up to 12.7 tons of the radioactive material.
- Depleted Uranium is used in the production of explosive shells against armoured battle tanks.

Centrifuge cascades



FUEL FOR NUCLEAR REACTORS

- For nuclear reactor fuel, the uranium typically is enriched to contain 3% - 5% U-235.
- This enriched uranium is then converted into uranium dioxide (UO2) powder.
- It is then pressed into small pellets- each roughly the size of a coin and about an inch long-and then placed into long fuel rods for use in commercial nuclear reactors.
- The rods form the core of the nuclear-power reactor and are used for 12-18 months.
- After use, their metallic outer casing is stripped away and they are dissolved in hot nitric acid. The process produces uranium (96%) also referred to as **Depleted uranium (DU)** - uranium primarily composed of the isotope uranium-238 (U-238).

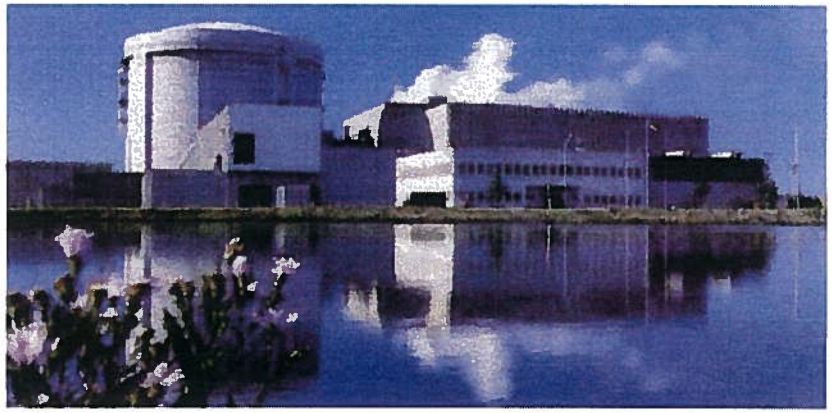
A rough energy guide

ENERGY SOURCE	ELECTRICITY PRODUCED
1 kg of firewood	1 kwh (kilowatt hour)
1 kg of coal	3 kwh
1 kg of oil	4 kwh
1 kg of Uranium	50,000 kwh

The N.B. Point LePreau nuclear reactor.

Pressurized Heavy Water Reactor (CANDU)

CANDU is a pressurized heavy water reactor operated on *natural uranium* fuel (U-238) and uses heavy water (D_2O) as coolant and moderator. CANDU is an acronym for CANada Deuterium Uranium. The CANDU reactor is capable of on-line refuelling during operation.



Natural uranium contains 0.7 percent U-235, whereas nuclear weapons typically require uranium enriched to 90 percent or more U-235.

NUCLEAR BOMBS

- The same enrichment process used to make nuclear-reactor fuel continues.
- Enriched U-235 moves down a series of about 1,500 centrifuges.
- At 20 percent purity, the uranium is considered "highly enriched uranium" (HEU).
- It takes about a year to enrich U-235 to weapons grade, or 90 percent pure, uranium-which can then form the core of a nuclear bomb.
- The higher the enrichment level, the less HEU is needed to make a bomb.
- Enriched Uranium- Uranium with an increased concentration of the isotope U-235.
- Natural uranium contains 0.7 percent U-235, whereas nuclear weapons typically require uranium enriched to 90 percent or more U-235.

Stockpiles of Depleted Uranium

Depleted Uranium Shells (Tank and other)

Uranium Production in Canada

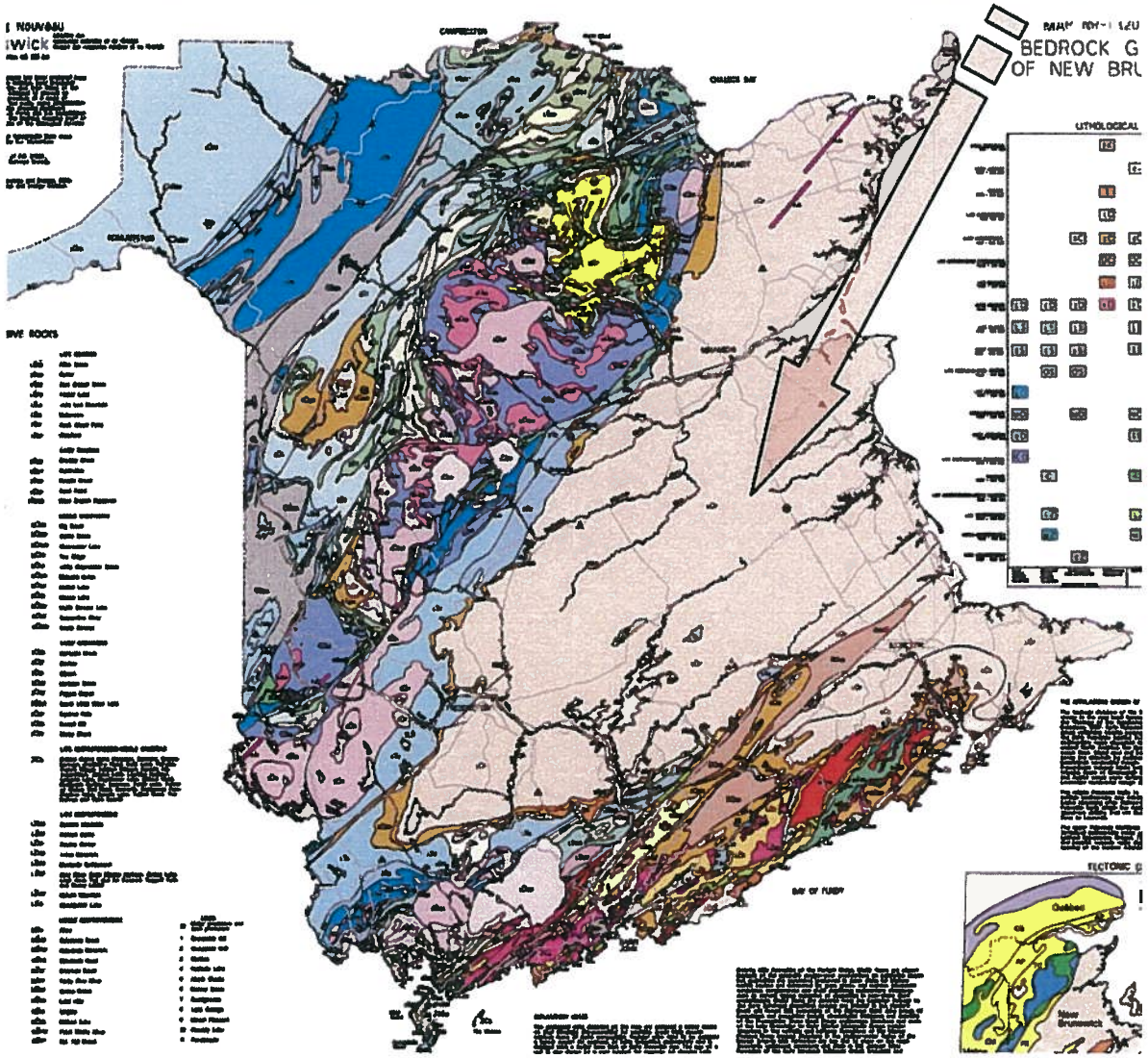
http://www.world-nuclear.org/info/inf49.html

(Updated 15 September 2009)

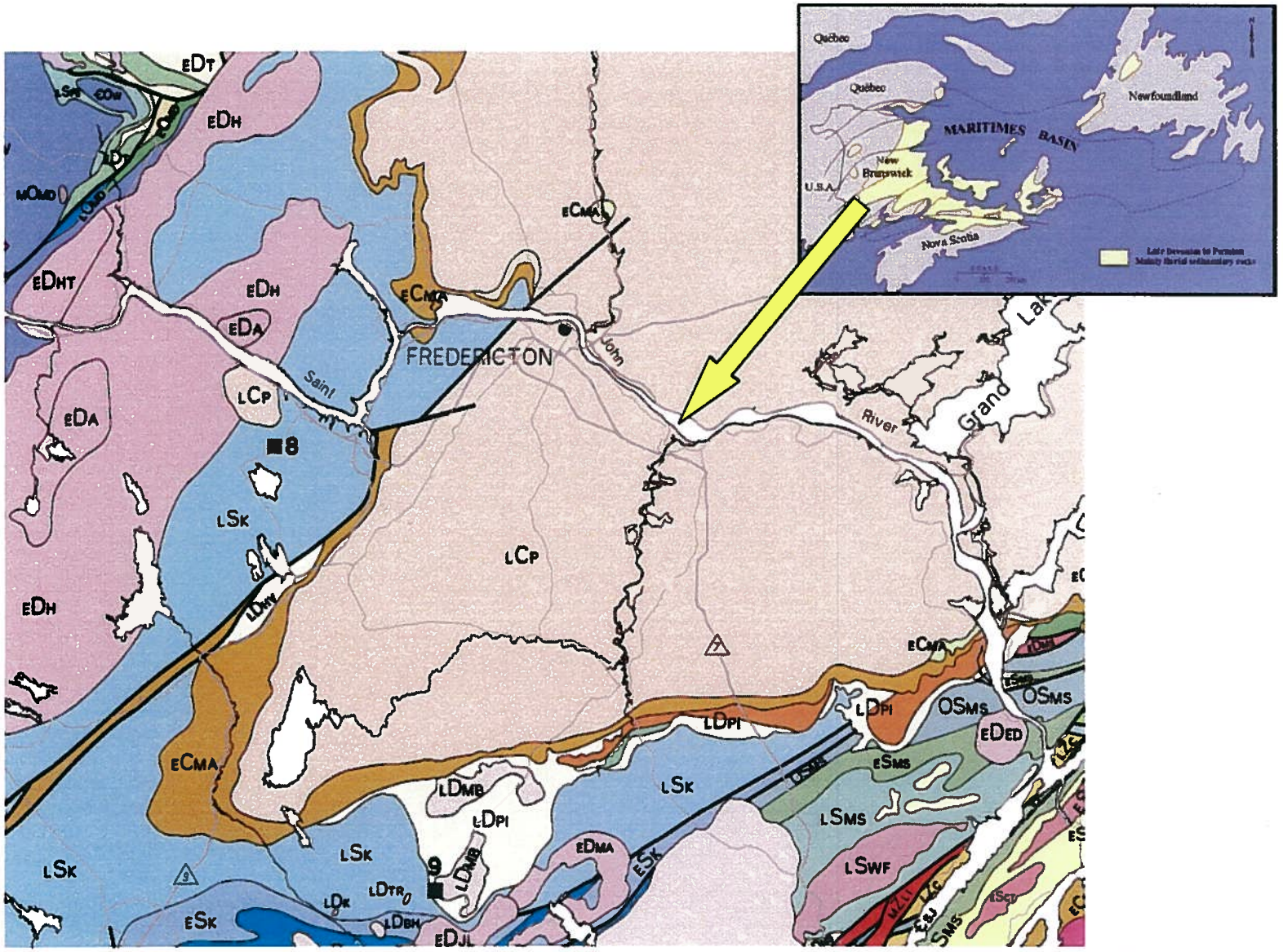
- **Canada is the world's largest uranium producer, accounting for 20.5% (9,000 tonnes U) of world output in 2008.**
- **Production comes mainly from two mines in northern Saskatchewan province, one of which, McArthur River, is the largest in the world.**
- **Production is expected to increase significantly after 2011 as several new mines, now planned or under construction, go into operation.**
- **With known uranium resources of 499,000 tonnes of U_3O_8, as well as continuing exploration, Canada is in a strong position to meet future world demand. Only Australia has more known uranium resources.**

Uranium occurs in most rocks in N.B.

Higher concentrations have been found in carboniferous sediments of the central Maritime Basin area



UNBI


Québec
Québec
Newfoundland
MARITIMES BASIN
New Brunswick
U.S.A.
Nova Scotia
FREDERICTON
Saint John River
Grand Lake
EDT
EDH
EDHT
EDA
ECMA
LCP
LSK
LDMT
LDMB
LDPI
LDTR
LDK
LDBH
EDJL
EDMA
ESK
LSMS
LSWF
OSMS
EDED
ESMS
8
9

QUESTIONS