CCAMU
The Community Coalition Against Mining Uranium

To: Leslie Payette
Manager of Environmental Administration
Nunavut Impact Review Board

Re: Screening for AREVA Resources Canada's "Kiggavik" project proposal
file number 09MN003.

The Community Coalition Against Mining Uranium appreciates the opportunity to provide a comment to the NIRB on the proposal by Areva Resources to open a uranium mine in the Kivalliq Region, west of Baker Lake.

The CCAMU is a grassroots organization and, while located in Eastern Ontario, has the support of thousands of people across Canada and beyond. The group was formed in response to the proposed exploration for and potential development of a uranium mine north of Sharbot Lake in the Ottawa River watershed.

CCAMU convened The Citizens' Inquiry into the Impacts of the Uranium Cycle which was held February through May 2008 and, subsequently, on June 24, 2008, released a 56-page report entitled, 'Staking out Claim for a Healthy Future.' The report captures the essence of 387 presentations and submissions from individuals and groups and embodies the comments of many people and organizations, from civil society to experts. The majority of submissions and presentations expressed concern and provided information related to the uranium cycle and were not specific to the situation near Sharbot Lake. For this reason, we request that you consider both the report and submissions to the Citizen's Inquiry, before moving forward.

Since The Nunavut Impact Review Board (NIRB) has a mandate to protect the integrity of the ecosystem for the existing and future residents of Nunavut, we feel that it is important to review the complete uranium cycle when considering development that involves uranium. It is through knowing the full cost and impact of mining and use of

uranium that a reasoned decision can be made whether or not to proceed with development.

The report, "Staking our Claim for a Healthy Future,' is attached, although parts relating to Ontario legislation for the staking of claims and exploration and to the Mining Act, that we feel would not be relevant to your process, have been removed. Other sections, including Appendix 5: Key Events, have been removed as they pertain to the events around Sharbot Lake. The full report and submissions can be viewed at www.uraniumcitizensinquiry.com . We have added an extra appendix to the report as we feel that it would be of interest to your Review Board. Appendix 7 is a list of submission titles relating to **Uranium & Daughter Products**, **Mining & Processing, Waste, Health & Safety Risks.**

We trust that NIRB will consider the full uranium cycle in the screening process for AREVA Resources Canada's "Kiggavik" project proposal.

Sincerely,
Marilyn Crawford
CCAMU

# COMMENT FORM FOR NIRB SCREENINGS

The Nunavut Impact Review Board (NIRB) has a mandate to protect the integrity of the ecosystem for the existing and future residents of Nunavut. To assess the environmental and socio-economic impacts of the project proposal, NIRB would like to hear your concerns, comments and suggestions about the following project proposal application:

**Project Proposal Title:** **Kiggavik Project**
**Proponent:** **AREVA Resources Canada Inc.**
**Location:** **Kivalliq Region**
**Comments Due By:** **February 10, 2009** **NIRB #:** **09MN003**

**Indicate your concerns about the project proposal below: concerns marked with X**

- ☐ no concerns
- X water quality
- X terrain
- X air quality
- X wildlife and their habitat
- X marine mammals and their habitat
- X birds and their habitat
- X fish and their habitat
- ☐ heritage resources in area
- X traditional uses of land
- ☐ Inuit harvesting activities
- ☐ community involvement and consultation
- X local development in the area
- ☐ tourism in the area
- X human health issues
- ☐ other: CCAMU is concerned about the impacts of the complete uranium cycle, from mining to the uses of uranium

**Please describe the concerns indicated above:**

Details are included in submission.

**Do you have any suggestions or recommendations for this application?**

CCAMU recommends that the NIRB consider all environmental and health issues related to mining uranium of the Kiggavik Project. A full examination of the cumulative impacts of these activities on air, land, and water should be undertaken. NIRB should recommend to the Minister that the review process include consideration of the impacts of the full uranium cycle.

## Do you support the project proposal? No

## Any additional comments?

CCAMU recommends that any licencing and authorization at the territorial level be denied. Please see submission.

**Name of person commenting:** Marilyn Crawford **of** Godfrey Ontario
**Position:** **member** **Organization:** Community Coalition Against Mining Uranium
**Signature:** _____ **Date:** Feb.

# STAKING OUR CLAIM FOR A HEALTHY FUTURE

Report of
The Citizens' Inquiry into the Impacts of the Uranium Cycle,
held January through June, 2008
in Eastern Ontario,

Convened by
The Community Coalition Against Mining Uranium

www.ccamu.ca

June 24, 2008

*****

# Executive Summary

Prospecting for uranium in the Sharbot Lake region, in eastern Ontario, and the possible startup of mining uranium in the region are issues that raise troubling questions for the local residents, including two First Nations bands. Exploration and mining uranium raises significant health concerns, not only for locals and those employed in the mines, but for flora and fauna and the hundreds of thousands of residents in the affected watersheds, including residents of the city of Ottawa.

These issues have been the subject of considerable community concern and action. In response, the Community Coalition Against Mining Uranium (CCAMU) organized the Citizens' Inquiry into the Impacts of the Uranium Cycle, which convened a series of public hearings in April 2008, at which 157 oral presentations were heard. The inquiry received some 230 briefs and submissions from individuals and organizations.

The inquiry is now recommending that:

1. To ensure that negotiations with First Nations over land rights are undertaken in good faith, and to assess alternatives to the use of uranium, the Ontario government declare an immediate moratorium on the exploration and mining of uranium in Ontario until such time as all environmental and health issues related to mining uranium are resolved and a full examination is completed of the cumulative impacts of these activities on air, land, and water.

2. The Ontario government establish a royal commission to review the *Mining Act* and bring its provisions in line with current values and expectations, and, in the interim, enact a new policy or law prohibiting prospectors from entering private land and First Nations land without written consent.

3. The Ontario government undertake independent and professional studies of the health of residents in places where uranium has been processed, such as Port Hope, Blind River, and Chalk River.

4. Since new nuclear power plants will not be in operation until 2018, at the earliest, and a shortage of electricity is projected to occur by 2013, the province not proceed with plans for new nuclear power plants, but instead apply the $40 billion plus, allocated to new nuclear plants to immediate energy solutions, including reducing energy use, expanding sustainable sources of energy, and setting up a transition fund; and that Ontario's existing nuclear power plants be phased out as alternative energy sources become available.

5. The province undertake a study on the alternatives to the use of uranium for medical purposes, particularly radioisotopes.

6. The province begin discussions with the federal government to ensure that the Supreme Court of Canada decisions regarding discussions and negotiations with First Nations are incorporated into proactive operating practice by the relevant officials of both governments.

This report sets the background to the inquiry and explains why these recommendations are not only reasonable and important, but also need to be proceeded with immediately. Appendices to the report provide further detail about the hearings, the presenters, and a list of key events in the past twenty months.

Contents

Introduction

The events that precipitated a blockade, the creation of a new community coalition, many meetings, fundraisers and protests, the engagement of the interests of many thousands of people, a sixty-eight-day hunger strike by a grandmother, the jailing of a native elder, a series of public hearings, and this report were simple enough on the surface, but complex and fundamental underneath.

On the surface the issues involved the Ontario *Mining Act* and the unimpeded access to private property given to prospectors and mining companies, and the concerns about exploring for and mining of uranium, the health aspects of these activities, and the impacts of uranium use on health and well-being. Roiling below this surface was a cultural clash and collision of English common law property rights and Aboriginal rights as embraced by First Nations. This clash has darkened Canadian history for more than three centuries and requires resolution at senior political levels.

In October 2006, residents living north of Sharbot Lake in Frontenac County, in the process of collecting firewood on their property, learned more than they wanted to know. The area has been treasured by many for decades, providing, as it does, a good retreat from city life, and some families have owned property there for several generations. The area became even more popular during the 1990s, as people thinking of retiring looked for a simpler lifestyle. Many residents have decided to reduce their use of electricity and reduce their ecological footprint, relying more on solar power and high-efficiency wood stoves.

But for one family, the search for firewood revealed something else -- the discovery that trees on their properties had been cut down at shoulder height, with tops squared and tagged. The silver tags were numbered, and showed the Province of Ontario emblem. On some lots a dozen or more trees had been blazed and a pink marking tape marked the line between them.

These residents learned that their property had been staked by a licensed prospector .They soon learned about the Ontario *Mining Act* and how, for some property owners in the area, it gave little protection from unwanted prospectors and exploration activity on property they paid taxes on and thought they owned. They learned that this activity had also taken place on 30,000 acres of neighbouring land that Aboriginals had never ceded to the Crown, and that no consultations with First Nations had occurred. They learned that the staking had been done for the purposes of proving a deposit of uranium. Thus began their discovery of the significant impact that the exploration and mining of uranium has on a locale, on communities, nations, and the planet Earth.

To many residents these were hard and most disagreeable lessons. Many people and organizations responded, and almost two years have been spent addressing these issues in the hope of finding public support for their call for a moratorium on exploration and mining of uranium and for a public review of the *Mining Act*. They explored alternatives that would make more sense for the residents of North Frontenac, Aboriginal communities, and Ontarians in general were outlined and brought to the attention of their representatives in government.

One of the most significant responses was The Citizens' Inquiry into the Impacts of the Uranium Cycle - including a series of public hearings held in April 2008. As one submission noted, the Citizens' Inquiry "gave people yearning to serve a chance to contribute, to participate, and to get involved." The Inquiry helped people learn from others, find common ground, and to be positive about the kinds of changes needed in public policy -- changes to be brought to the attention of decision-makers.

This report summarizes five dominant themes of the presentations and written submissions:

the Ontario *Mining Act* and the impacts of claim-staking and exploration
the impacts of mining uranium;
the uses of mined uranium;
the health and safety issues associated with the uranium cycle
the alternatives to the use of uranium; and
mining and Aboriginal interests.

The report makes recommendations for action. References to the briefs supporting the material in this report can be found at the end of the report, along with a description of the hearings. A list of the briefs submitted, and the briefs themselves, is at www.uraniumcitizensinquiry.com .

**A. The Impact of Claim-Staking and Exploration: The Ontario *Mining Act*: removed**

**B. Impacts of mining uranium**

It is one thing to learn that mining activity might be happening in your community, but it's another thing to learn that the mineral involved is uranium. As residents in the Frontenac area quickly discovered, when uranium prospecting happens in your community, you want to become fully informed about the impacts.

i) Uranium daughters:

The impacts of mining uranium are much different than the impacts of mining other minerals because of the nature of uranium itself. Uranium has constituent parts that, to varying degrees, are released to the air, land, and water as the ore containing it is taken from the ground. These parts - often called "uranium daughters" - are thorium-230, which in time becomes radium-226, which in turn becomes radon-222; and gamma radiation. They are all radioactive. Very small amounts of these materials cause significant health risks and governments regulate the amount of permitted exposure to humans. But there are strong arguments, supported by powerful evidence, suggesting that the amounts permitted in the regulations are too high. Environment Canada and Health Canada have both concluded that these substances are toxic according to the definitions of the Canadian *Environmental Protection Act*.

ii) Development of a uranium mine:

The release of radon gas - the second leading cause of lung cancer, after smoking, can occur very early in the mining cycle. For instance, it can be released as exploratory drilling begins, and once preliminary stripping and trenching starts. Drilling may take place in a way that harms watercourses by releasing the daughters into the air or through fractious or porous rock into a watercourse or groundwater.

These activities can be carried out without consent of the landowner, and without any formal permission required of any governmental body. This means that the earliest of the mining stages can be carried out without regulation even though they may have significant health impacts, and the communities and local municipalities can do nothing to stop this from occurring. For example, the Algonquin First Nation and twenty municipal councils (representing well over one million people) in the area have requested that a moratorium on exploration and mining uranium be put in place – apparently to no effect.

Later stages of the mining cycle, such as advanced exploration, will involve more drilling and blasting, bulk sampling, and some underground work. The impacts become more evident and the spillover effects more likely. When full production is underway, the documented impacts can be mitigated, but not prevented.

Before uranium mining activity can begin, approvals are required under the *Atomic Energy Control Act* and *Canadian Environmental Assessment Act*. The latter act requires the preparation of a Comprehensive Study Report, and if the (federal) Minister of the Environment concludes that the mine will not cause significant adverse environmental effects, the Canadian Nuclear Safety Commission (CNSC) may proceed with the appropriate licensing process.

While the process seems on the face of it to address public concerns, the history of uranium mining in Canada indicates that this is not the case.

iii) Waste rock and tailings:

Perhaps the most widely known impact of production is the waste rock (the rock with the least heavy concentrates of uranium) and what are called "tailings." Tailings are the materials considered "waste" after the mined ore is crushed and milled into fine sand and then processed with acids so that the uranium is chemically extracted into an impure concentrate known as yellowcake. The yellowcake is removed for further processing, while the tailings, which include heavy metals, acids, and radioactive materials are left on site.

While milling removes uranium, it leaves the decay or daughter products – thorium-230, radium-226, and radon-222 – which constitute about 85 per cent of the radioactivity in the ore. Waste rock, with that 85% of the radioactivity remaining, is dumped near the mine, where it quickly grows into enormous piles. To limit the leaching of the daughters and other contaminants (including acids and heavy metals) from the tailings into the air and soil, tailings must be covered in clay, vegetation, and/or water. The sites must be shored up to limit erosion and seepage, and then carefully monitored. These control mechanisms must then be kept in place – for tens of thousands of years - virtually forever, in human terms. (The half-life of thorium-230 is 75,000 years; of radium-226, 1,600 years.) This raises concerns in regard to how current and future generations will manage the growing waste over the centuries and millennia.

In some areas, lakes have been drained for the purposes of storing tailings. Since the uranium proposed to be mined in the Sharbot Lake area is low-grade, the amount of waste and tailings will be considerably larger than in Saskatchewan, where the uranium mined is considered of high grade.

iv) Health risks:

Air contamination is a serious problem, since radon gas, released with the first hole drilled, can be carried by the wind and lodge on plants, vegetation, and crops and then eaten by animals and/or people. The area affected by the contamination can be extensive, and the health risks considerable.

The risk of contamination to uranium miners is also considerable. Dr. Helen Caldicott estimates that "between one-fifth and one-half of uranium miners in North America have died and are continuing to die of lung cancer."

As the ore is pried free, miners are exposed to the initial release of the uranium daughters. The rate of cancer among these miners has been shown to be much greater

than in the population at large. Health risks to employees from uranium mining are singled out in the Ontario *Workplace Safety and Insurance Act*, which concludes that primary cancers of the trachea, bronchus, and lung among workers previously employed in uranium mining in Ontario are recognized as occupational diseases. The *Act* considers that the cancers are characteristic of uranium mining and result from exposure to ionizing radiation relating to the uranium mining industry.

The risk to the public from control systems breaking down or malfunctioning is also considerable, and there is much documentation on systems breaking down, even though the mining of uranium has a history of not much more than one hundred years.

Water contamination almost inevitably occurs. Large amounts of water are used in the milling process, which requires that the mine be located close to a significant water supply; accidental spills or the disposal of untreated water back into a lake or river system often also involve contaminants. In the case of Sharbot Lake, the water will flow directly through the Mississippi water system into the Ottawa River, upriver of Canada's capital. Uranium exploration in the Haliburton area has raised similar concerns about contamination of the Otonabee River watershed, which provides drinking water for the city of Peterborough.

Water contamination from tailings is also a significant problem, as the case of Elliot Lake, and the Serpent River System, east of Sault Ste. Marie, demonstrates. Rio Algom opened its first of eight uranium mines there in 1953, followed shortly thereafter by Denison Mines. Uranium was mined there until the 1990s, producing about 200 million tonnes of tailings. In 1993, there was a major breach of the tailings control, with a spill of about 2 million litres of contaminated water into a lake. The Serpent River area was especially damaged by contamination -- the river basin is home for the Serpent River First Nation Reserve. Since the tailings are covered with water that is dammed on a site sitting just above the Serpent River, there are many concerns about future contamination.

**"The uranium cycle from beginning to end poses a serious threat to human health and has long-lasting environmental hazards, which are incompatible with sustainability. Infants and children are especially vulnerable. As health care practitioners, we support the resolution of numerous Ontario municipalities in demanding a moratorium on uranium mining. The threat to human and environmental health posed by uranium cannot be reversed once unleashed. Prevention is the Only Cure."**

**From brief by Kawartha Community Midwives.**

To date, some thirty breaches of tailing sites and dams have been reported in the area. Not all tailing sites have been identified in the Elliot Lake area, and there is no plan of control or remediation that can be sure to be effective throughout the next tens of thousands of years. Government rules have changed concerning the control of uranium

mining and tailings since the Elliot Lake experience, but that provides little comfort for those who understand that containment strategies, no matter how intelligent, rarely remain effective over decades, let alone centuries.

Similar problems have been noted at the Madawaska mine in the Bancroft, ON area. The mine was decommissioned in 1982, leaving about 4 million tons of tailings behind. Decommissioning issues have also been raised in regard to the four uranium mines now operating in Saskatchewan. It would be wise to resolve these and other concerns before forging ahead with further extraction.

The risk to the public from control systems breaking down or malfunctioning is considerable, as are accidents during transportation. See appendix for more information related to health risks.

v) Local physical and economic change:
Mines cause substantial and harmful changes to the landscape, not only because of the mine itself, but also because of the storage of waste rock and tailings, and the new roadways and other transportation routes needed. The mine at Sharbot Lake would most likely be an open pit mine, where ore is stripped away in layers, revealing a gigantic hole surrounded by waste ore and tailings. Considering the amount of rock that would be required to be processed in a low-grade mine, an underground mine would hardly be less intrusive.

A mine uses an enormous quantity of water, and this use would occur in an area where many people rely on local water supply for consumption and recreation. It is questionable whether the water quality could be sustained for these purposes with an operating mine in the area.

**"There is an urgent need for sober second thought and a full open and comprehensive examination of the health, social and environmental impacts of all energy issues in general and the uranium issue in particular. We cannot afford to get this wrong."**
**From brief by Jeremy Wright, "The Fork in the Road."**

A uranium mine will also cause a substantial decrease in the value of properties. Few people would choose to live or play close to a uranium mine, or on a body of water that could be contaminated by the mine.

vi) In summary, the impacts of uranium mining include: air, water and land contamination; impacts on local flora and fauna; health issues for those who work at the mine, live in proximity to the mine or live downriver or downwind of the site; a loss of property value; and damage to the natural landscape.

Uranium mining in the Sharbot Lake area would take place in a watershed flowing through settled areas, including the City of Ottawa, with the likelihood of contaminated water being the new reality for hundreds of thousands of people.

Given these problems the Algonquins declared a moratorium on exploration and mining of uranium in this area on September 28, 2007, and the City of Ottawa and nineteen other municipal councils in eastern Ontario have passed resolutions calling for a moratorium and/or a change to them *Mining Act*. The local jobs that a mine might produce are judged to be far outweighed by the many negative short and long-term impacts of the mine.

Serious consideration must be given to declaring a moratorium in the prospecting and mining of uranium in Ontario. That would permit alternatives to be explored to the outcomes to which uranium is employed, as noted below, and as discussed in section E, to provide resolution of First Nation issues. (Section E includes recommendations on this matter.)

**C. The uses of mined uranium**

Some advocates argue that while there may be difficulties and risks in getting uranium out of the ground and preparing it for use, those difficulties and the harm that might be caused are more than outweighed by the advantages that accrue because of uranium. Presenters at the hearing also addressed these issues, and this section summarizes the evidence that they provided.

i) Processing ore

Cameco Corporation, a vertically integrated uranium company, is the big player in Canada. It is the world's largest uranium supplier. It owns uranium mines in northern Saskatchewan, and in Wyoming and Nebraska; it owns Canada's only uranium refinery, located in Blind River; it processes uranium products in Port Hope; and it owns shares in Bruce Nuclear Power.

The yellowcake that is the product of milling and processing at mines in northern Saskatchewan, Wyoming and Nebraska, is transported to Cameco's Blind River facility on the north shore of Lake Huron near Elliot Lake. (Until the early 1980s the refinery was located in Port Hope.) The Blind River refinery is reputed to be the largest in the world. With an annual output of about 24,000 tonnes, it provides about 20 per cent of the world's uranium production.

The Blind River refinery processes the yellowcake into high purity uranium trioxide. Some 85 per cent of the product is then exported to United States (76%), United Kingdom, France, and other countries; the remaining 15% per cent is shipped by truck

to Cameco's facility in Port Hope. The uranium trioxide is further refined at the Port Hope facility into two products: uranium hexafluoride and uranium dioxide. The uranium hexafluoride is exported for use in non-CANDU reactors around the world.

The uranium dioxide is used to make fuel pellets and fuel bundles for CANDU reactors in Canada. This work is done by Canadian General Electric at factories in Toronto and Peterborough; and by Zircatec in Port Hope. Wastes from these three factories are stored on site since there is no approved storage facility to which they can be sent.

Some waste from Cameco's Port Hope facility is trucked to Blind River, where it is incinerated, but about 8,000 barrels of soil and concrete are stored onsite in Port Hope, waiting for approval to send them to a low-level radioactive waste site in United States.

On May 21, 2008, Reuters News Agency and the *New York Times* reported that a Cameco spokesman said that arsenic and uranium may have leached into Lake Ontario. Contaminated soil was found around the plant last year, and the plant has been closed since July 2007. Some $250 million is allocated to be spent on clean-up.

The Blind River refinery is licensed by the Canadian Nuclear Safety Commission, and is also subject to control by the Ontario Ministry of the Environment. The area surrounding the refinery is subject to uranium emissions affecting vegetation, soil, and those employed there, where rates of lung cancer are higher than among the population at large. Measurable emissions have increased since the refinery opened more than twenty years ago, but they remain within the limits established by the appropriate public bodies. Accidents do occur. In 1990 178 kilograms of uranium dust were released into the atmosphere within a twenty-six-hour period, and Cameco's license was revoked for a week. In 2002 average weekly emission levels from the incinerator were exceeded on two occasions, and daily emission levels were exceeded once. The Mississaugi First Nation resides in the Serpent River basin, downstream from the Blind River facility.

The community of Port Hope has had more than sixty years of exposure to radioactive and heavy metal emissions from ongoing nuclear industry operations (including radium extraction, processing, refining, and fuel bundle assembly) and radioactive waste storage and disposal in and around town. These practices, as well as decades of inaction by the federal government, have

**"Just recently, when contamination was documented in the bodies of 9 former nuclear workers and local residents including a child, Health Canada has re-stated its position both in person to Town Council and on its web site that `all of this monitoring consistently indicates Port Hope residents are not at risk.' This position by a federal guardian of our public health is not precautionary as it should be, it is not defensible and it is not acceptable. It is not supported by science or medicine and must be challenged – it must be changed."**

**From brief by Port Hope Community Health Concerns Committee.**

resulted in approximately 3.5 million cubic metres of waste being stored in hundreds of sites that require cleanup. The federal government has committed $260 million to this cleanup.

Rates of radon-222 were discovered to be high in 1975, but a study of the public health effects of the processing plants there has never been done, although several studies have been promised over the years. A small test of nine residents done by a non-governmental organization in the past two years indicated elevated levels of radiation.

Although the data is limited in Canada because of the existence of few studies, there appear to be obvious risks involved to those working in or living in proximity to facilities that refine and process uranium products, and their health is at greater risk than those outside such communities. The risks are a result of not just the inevitable accidents that accompany all human enterprises including the processing of uranium, but also the normal functioning of the facilities within the technical limits established by governments. It is clear that several definitive independent professional studies are needed of residents in places where uranium has been processed – Port Hope, Blind River, and Chalk River are places where testing should be done – to determine the actual impacts of uranium on health.

**Recommendation #3:**
The provincial government contract for and fund several definitive independent professional studies of residents in places where uranium has been processed such as Port Hope, Blind River, and Chalk River, to determine the actual impacts of uranium on human health.

ii) Medical
Medical radioisotopes are manufactured from uranium products at the National Research Universal Reactor (NRU) in Chalk River, about 200 kilometres northwest of Ottawa. The NRU supplies about two thirds of the world's radio-isotopes, and they are used for diagnostic imaging and cancer treatment. The Chalk River operation came to public attention in late 2007 when the Canadian Nuclear Safety Commission (CNSC) required it to shut down after it had not made the changes required to its emergency backup power system. (The Government of Canada intervened, claiming there was an emergency with the supply of medical radioisotopes. Parliament voted to override the CNSC's order and the reactor was restarted.

Another function of the NRU reactor is to test materials and fuels to advance the design of the CANDU reactor for the Atomic Energy Canada Limited.

Three isotopes are produced: cobalt-60, molybdenum-99, and technetium-99. Cobalt-60 emits gamma rays used externally to irradiate tumours and to sterilize medical instruments. Molybdenum-99 is broken down into units of technetium-99, which is used internally for diagnostic purposes. Technetium-99 is much milder than cobalt-60, and thus has fewer negative impacts on patients.

Molybdenum-99 is produced by AECL in a nuclear reactor with high-intensity neurons requiring fuel that is weapons-grade uranium, about 95 per cent enriched. One commentator notes: "Mo-99 is like a piece of candy that is produced as a byproduct of the nuclear weapons business. Without nuclear weapons it would be too expensive to produce the Highly Enriched Uranium in the first place."

There is no question of the good that these isotopes accomplish. The question is whether they can be obtained in ways that do not require weapons-grade uranium.

In Australia, cyclotrons - a type of particle accelerator - have been used for a decade to produce about one-quarter of the radioisotopes needed for medical purposes, and eight years ago it was thought that this figure would quickly reach 80 – 90 per cent as technology improved.

Unlike nuclear reactors, cyclotrons do not melt down; they produce very small amounts of radioactive waste; and they do not require the mining of uranium or lead to the health and environmental problems that accompany such mining. Thus it seems that an alternative to uranium is already available to help produce these important isotopes.

If this alternative is not as promising as reported, in any case, only a very small amount of uranium would be needed to produce a ready supply of radioisotopes, and there would be no need (or economic justification) for opening new mines or creating new refineries.

Further, the question has been raised as to whether more cancers are actually created during the exploration and mining of uranium and its subsequent use – in refineries, nuclear plants and in bombs - then will be cured with the resultant isotopes.

iii) Electricity:
The Premier of Ontario has announced the government's intention that nuclear power stations will continue to meet about half of the electrical supply needs in Ontario in future years. He proposes to spend over 40 billion dollars subsidizing the building of these reactors, and states that the power plants would come online in about ten years, by 2018.

Very strong objections to this proposal for new nuclear power plants were made at the inquiry hearings. The objections can be summarized under the following headings.

Timing:
Ontario Power Generation and others have projected serious shortages in electrical supply in about five years time. There is no scenario in which any investment in new nuclear power plants can assist in responding to this shortage; the best scenario is that the new plants would come on stream in 2018, and given the past Ontario experience of not meeting timelines, that date seems very optimistic. Clearly, to respond to the projected shortage of electricity, viable alternatives to new nuclear plants are needed.

Cost:
The cost estimates for nuclear plants in Ontario have historically been far below the actual costs incurred: final costs in the past have consistently been two or three times higher than estimates. The reason that Ontario Hydro was left with more than $20 billion in "stranded debt" is largely because of nuclear cost overruns in the past, accounting for about $15 billion of that amount, which is noted on individual hydro bills as "debt repayment." In all likelihood the cost of these new facilities will be in the order of $100 billion. This finding raises the question of whether there are wiser ways to spend this money to address energy needs.

Safety:
Nuclear energy is a high-risk activity. There have been three very serious accidents with nuclear power plants: Windscale (U.K.) in 1957; Three Mile Island (U.S.A.) in 1979; and Chernobyl (Ukraine) in 1986. A fire at Windscale released large amounts of radioactivity. At the Three Mile Island plant the core melted; 100 planned nuclear power plants in United States were quickly abandoned, and no new plants have been built in United States since. The deaths caused by the Chernobyl accident are estimated in the thousands, with many, many more people suffering from diseases caused by radiation.

**"Much of the energy generation and transmission infrastructure on Ontario is antiquated and reaching the end of its expected lifespan. Ontario appears poised to invest more than $40 billion in nuclear plants which will come on too late, and commit Ontario to rebuilding its energy system based on an obsolete model of highly centralized and inherently fragile generation."**

**From presentation by Lisa Gue on behalf of the David Suzuki Foundation.**

While there have not been any very serious accidents since Chernobyl, there have been many accidents in nuclear power plants. One report indicates there have been 10,000 worrisome events in nuclear power plants between 1986 and 2006, of which perhaps two dozen could be termed "serious." There are few patterns to the problems that occur, apart from human error while trying to control a most complicated system that has an extraordinary number of parts that can

malfunction. One comes away from the report thinking that the next major

It is worth noting that an insured upper limit of $75 million has been legislated for nuclear power plants. Given the high degree of risk associated with nuclear power, looking for alternatives is the most intelligent course of action.

Examples of particularly strong submissions can be found in the appendix on safety.

iv) Waste:
Nuclear power produces waste in the form of spent fuel bundles. These are highly radioactive, and currently some 85,000 spent bundles are being stored at the power stations because there is no facility in Canada where they can be permanently stored. They must be stored for thousands of years before the radiation has degraded to such a degree that the fuel bundles are no longer dangerous. The length of time required for human organizations to oversee this waste is truly awe-inspiring. The cost of a long-term depot to store nuclear waste from power plants is not factored into the cost of the facilities, or into the estimated costs of the new reactors proposed by the Premier. (A report on long-term storage, "Choosing a Way Forward," has been prepared for Nuclear Waste Management Organization, www.nwmo.ca .)

Not to be forgotten are the dangerous wastes created in the process of mining and refining the uranium needed for these nuclear power plants: these wastes must be included in any consideration of a facility that depends on uranium, since if uranium is not mined, these wastes will not be created.

v) Sustainability and reliability:
Canada's supply of high-grade uranium is estimated to last about forty years – a short period given that the supply of natural gas is estimated at seventy years. An indication of the sense of a growing uranium shortage is its price, which has grown by a factor of five in the last decade. In considering uranium as a fuel, we need to ask serious questions about the sustainability of its supply. Some have suggested that the supply of low-grade uranium, such as is being proposed for mining in the Sharbot Lake area, is greater than forty years, which is true, but the cost of extraction and the harm caused are considerably greater than in the mining of high-grade ore.

It is well known that the nuclear power plants in Ontario are notoriously unreliable. Because of operating problems and the difficulty of making repairs, most nuclear plants have run at just over 40 per cent of their capacity, when it was expected that they would, like most other machines, run at 80 to 90 per cent of capacity. Past experience would indicate that it is not wise to assume that new nuclear power plants would any

more reliable. Similar problems have been experienced in the United States and worldwide.

vi) Greenhouse gases:
It is often argued that nuclear power does not add to the problem of greenhouse gases, which are causing such significant environmental problems. The process of mining and processing uranium results in the creation of large amounts of greenhouse gases, as does construction of the facility itself. After construction the operation of the nuclear power plant is cleaner than an energy plant burning fossil fuels would be, but when the whole cycle is taken into account, through to decommissioning, the picture changes. The total life cycle of the power plant is certainly not close to zero, and it is considerably higher than the total life cycle of renewal sources of energy. It takes fourteen years to break even on the carbon footprint with high grade uranium, and there is a negative return when low grade – such is available at Sharbot Lake – is used.

One presenter, quoting a study by the Pembina Institute, summed up the problems with nuclear power this way:

> The study concludes that no other energy source combines the generation of a range of conventional pollutants and waste streams - including heavy metals, smog and acid rain precursors, and greenhouse gases - with the generation of extremely large volumes of radioactive wastes, that will require care and management over hundreds of thousands of years. The combination of these environmental challenges, along with security, accident and weapons proliferation risks that are simply not shared by any other energy source, place nuclear energy in a unique category relative to all other energy supply options.
>
> In the context of these impacts and risks, nuclear energy cannot be seen as a viable response to Green House Gas (GHG) emission problems associated with reliance on fossil fuels (e.g., coal) for electricity generation. In addition to the fact that nuclear power is not itself a GHG emission free energy source, a future path based on nuclear energy would simply replace one problem (GHG emissions) with a series of different, but equally unacceptable impacts and risks. These encompass everything from facility reliability and waste management to the potential for catastrophic accidents and nuclear weapons proliferation.

**Recommendation #4**
Since new nuclear power plants will not be in operation until 2018 at the soonest and a shortage of electricity is projected to occur by 2013, and because of their negative impacts, the province not proceed with plans for new nuclear power plants.

iv) Weapons:
One of the strongest and most emotional arguments against the production of uranium is that uranium products will find their way into the hands of those who want to create nuclear weapons. Given the nature of political disputes and the manner in which political decisions are made, there is considerable fear that nuclear arms will be used in an indiscriminate fashion – indeed, many have argued they were used that way in 1945. There are significant concerns that the few kilograms of uranium necessary for a nuclear bomb will fall into the hands of terrorists.

Very powerful evidence was presented to the hearings regarding weapons made of "depleted uranium." Depleted uranium is uranium enriched to a level of 3 per cent. This is the same level needed to fuel nuclear reactors, and is the same as the uranium product made in Canada, 85 per cent of which is exported. It is used in weapons because of its strength and its ability to pierce armoured and fortified targets.

Depleted uranium (DU) weapons have been extensively used by the United States and British military in Iraq because DU bullets and missiles can penetrate through walls and metal. It is estimated than more than 200 tonnes of DU weapons have been used in Iraq. On explosion, DU is reduced to very fine sand-like particles, each releasing a small amount of radiation. Women and children are especially vulnerable to the impact of DU. As well, the particles travel significant distances by wind, contaminating a very large area, with DU being picked up by filters in Britain some seven to nine days after the initial "Shock and Awe" campaign against Iraq in 2003. Thus the impacts from deploying depleted uranium weapons are widespread and insidious.

**D. Looking at Alternatives to Uranium**

If uranium were no longer available for human use – if, for instance, there was an agreement it would no longer be mined – could alternatives be found for the benefits that some advocates claim from the use of uranium? This is an area in which a great deal has been written, and much industrial activity has been undertaken. In the circumstances, this report can only point to directions that seem most likely to be successful to satisfy Ontario needs.

Obviously, no one would argue that there should be alternatives to any kind of nuclear weapon. Reducing the supply of weapons using uranium by reducing the supply of uranium itself would be a benefit to everyone in the world, even if other weapons of mass destruction (such as poisons) continued to exist.

But what about the medical benefits of the radioisotopes derived from uranium? Or the nuclear power plants existing or proposed?

As noted, radioisotopes are now produced in Australia without the need for uranium. In Canada we have the option of replicating that process, or purchasing radioisotopes from the Australian producers. It is unclear whether all Canadian needs can be met in this manner, but that direction seems promising. The benefit would be that the harmful impacts of mining, refining, processing, and manufacturing uranium could be avoided altogether.

Finding alternatives to nuclear power is a matter of much greater discussion, and various suggestions were made at the hearings. Germany has decided to close down its seventeen reactors – now producing the equivalent of about half the total supply of electricity from all sources in Ontario – in the next twelve years.

Germany – whose electrical needs approximate Ontario's total nuclear generation is in the process of phasing out nuclear over the next twelve years and closing down its seventeen reactors.

Finding alternatives to nuclear power is a matter of much greater discussion, and various suggestions were made at the hearings.

Presenters noted that the crunch in energy supply in Ontario comes in about five years – that is, five years before the new nuclear sources would be available. To avoid significant shortages something other than making a start on new nuclear power plants needs to be done within that period. Three suggestions were made to that address that shortfall.

**"Studies show each dollar invested in energy efficiency saves from five to seven times as much carbon dioxide as a dollar spent on nuclear."**
**Dr. Gordon Edwards, Canadian Coalition for Nuclear Responsibility,**
**cited in brief by Citizens Advocating Use of Sustainable Energy (CAUSE).**

First, and most importantly, reduce the amount of electricity used. Ontario Hydro encourages this with such programs as requesting that households replace old electricity-guzzling refrigerators, or by replacing incandescent light bulbs. Expanding this program significantly to address other ways in which services can be delivered using less electricity is clearly a cost-effective way to proceed, and can be implemented very quickly. The public has indicated its interest in helping to reduce electrical use. Governments and industry should be taking the lead in 'powering down' by turning lights off overnight, turning up thermostats during the summer and lowering them in the winter months. Increased subsidies could be provided to assist in replacing older appliances and machines with newer ones using less electricity, better insulating homes, etc. This could be done effectively using a fraction of the funds allocated for nuclear

power plants. Allocating $5 billion to reducing the use of energy would have a major impact. More could be done. Discouraging unnecessary consumption, which demands both resources and energy use, would be a place to start.

Second, reduce peak demand. Some local hydro companies are already doing this in a number of creative ways (such as signing up households with air conditioners so that those devices can be turned off for a few hours during high demand periods). Pricing mechanisms are also effective in reducing peak demand and have been used successfully in places such as California. Since energy supply is often considered reliable only when it can meet high peak demands, moderating peak demand is an important strategy.

Third, look for alternative and sustainable sources of electricity such as wind, wave, geothermal, and solar, alternatives which are used with much success in other jurisdictions. These sustainable methods of creating electricity are becoming more efficient and more affordable. The $40 billion, plus, currently allocated to subsidize nuclear power would be far better spent on alternatives that will move us toward a sustainable future. One merit of finding these sustainable sources is that they are usually in close proximity to users, thus avoiding long transmission lines where at minimum 10 per cent of the electricity is lost in the process of transmission.

**"Sustainability is not about turning back the clock but rather the long overdue evolution of rationalizing real human needs with real earthly processes. As a society in change Ontario will need every bit of the wealth now destined for nuclear development to effect the transitions that are required. Urban structures need to be reinvented. The meaning of labour will need to be redefined. Eco-cartography will reshape political boundaries. And most of all people will change culturally."**

**From Robert Lovelace's letter from jail.**

As presenters made clear, the needed electricity can be both saved and created if a portion of the more than $40 billion allocated for nuclear power plants is put into these three methods of meeting needs. Other monies from this sum will be required for a transition fund to support people holding jobs in the current nuclear power industry and the communities where those plants are located. Many "green" jobs will result as the movement toward alternatives grows.

Ontario's existing nuclear power plants should be phased out as alternative energy sources become available.

In short, current benefits from the use of uranium can be met in other ways with less environmental damage and less cost and human suffering. It is a mineral that we can well afford to leave in the ground, undisturbed. As a society, we and the generations that will follow us, will be better off for having done that.

**Recommendations #5:**
The province undertake a broad public review that is transparent and accountable, and led by individuals who evoke public trust, through a body such as a royal commission into the alternatives to the use of uranium for medical purposes, particularly radioisotopes.

**Recommendations #6:**
That the $40 billion allocated to new nuclear plants be reallocated to reducing energy use, expanding sustainable sources of energy, and instituting a transition fund for those employed in and living in the communities relying on nuclear power. And that Ontario's existing nuclear power plants be phased out as alternative energy sources become available.

**E. Mining and Aboriginal Interests**

Aboriginals have never ceded the non-privately owned land in this area claimed by mining interests to the Crown. The Royal Proclamation of 1753 required such an agreement with Aboriginal First Nations before the Crown could control the land, and this same land is now subject to a comprehensive land claim by the Algonquins of Ontario.

While this may be considered to present a confusing situation, senior courts, including the Supreme Court of Canada, have, in various decisions, outlined a clear course of action: namely, the need for the Crown to engage in discussions and negotiations with First Nations.

A 2004 decision of the Supreme Court of Canada, *Haida Nation v. British Columbia (Minister of Forests)*, [2004] 3 S.C.R. 511, cites its own decision in the 1997 *Delgamuukw* case, at para. 24:

> The Court's seminal decision in *Delgamuukw* … in the context of a claim for title to land and resources, confirmed and expanded on the duty to consult, suggesting the content of the duty varied with the circumstances: from a minimum "duty to discuss important decisions" where the "breach is less serious or relatively minor"; through the "significantly deeper than mere consultation" that is required in "most cases"; to "full consent of [the] aboriginal nation ... " on very serious issues. These words apply as much to unresolved claims as to

intrusions on settled claims.

And at para. 32:

> The jurisprudence of this Court supports the view that the duty to consult and accommodate is part of a process of fair dealing and reconciliation that begins with the assertion of sovereignty and continues beyond formal claims resolution. Reconciliation is not a final legal remedy in the usual sense. Rather, it is a process flowing from rights guaranteed by s. 35(1) of the Constitution Act, 1982. This process of reconciliation flows from the Crown's duty of honourable dealing toward Aboriginal peoples, which arises in turn from the Crown's assertion of sovereignty over an Aboriginal people and de facto control of land and resources that were formerly in the control of that people.

Regarding the extent of consultation, the Court said in *Delgamuukw v. British Columbia,* [1997] 3 S.C.R. 1010, at para. 168:

> The nature and scope of the duty of consultation will vary with the circumstances. In occasional cases, when the breach is less serious or relatively minor, it will be no more than a duty to discuss important decisions that will be taken with respect to lands held pursuant to aboriginal title. Of course, even in these rare cases when the minimum acceptable standard is consultation, this consultation must be in good faith, and with the intention of substantially addressing the concerns of the aboriginal peoples whose lands are at issue. In most cases, it will be significantly deeper than mere consultation. Some cases may even require the full consent of an aboriginal nation, particularly when provinces enact hunting and fishing regulations in relation to aboriginal lands.

The issue was further explored in a decision of the Supreme Court of British Columbia in 1997, *Haida Nation v. British Columbia (Minister of Forests)*, B.C. Supreme Court Decision, [2004] 3 S.C.R. 511, 2004 SCC 73, where the court set out provincial responsibilities:

> The government's duty to consult with Aboriginal peoples and accommodate their interests is grounded in the principle of the honour of the Crown, which must be understood generously. While the asserted but unproven Aboriginal rights and title are insufficiently specific for the honour of the Crown to mandate

> that the Crown act as a fiduciary, the Crown, acting honourably, cannot cavalierly run roughshod over Aboriginal interests where claims affecting these interests are being seriously pursued in the process of treaty negotiation and proof. The duty to consult and accommodate is part of a process of fair dealing and reconciliation that begins with the assertion of sovereignty and continues beyond formal claims resolution. The foundation of the duty in the Crown's honour and the goal of reconciliation suggest that the duty arises when the Crown has knowledge, real or constructive, of the potential existence of the Aboriginal right or title and contemplates conduct that might adversely affect it. Consultation and accommodation before final claims resolution preserve the Aboriginal interest and are an essential corollary to the honourable process of reconciliation that s. 35 of the Constitution Act, 1982, demands.

The weight of these decisions are reflected in the goals of the provincial government, as stated on the website of the Ontario Ministry of Northern Development and Mines, where it reads that the Ministry "is committed to meeting its duty to consult with Aboriginal communities and to ensuring that activities within its jurisdiction occur in a manner that is consistent with the Crown's obligations concerning Aboriginal and treaty rights."

But in spite of these statements, there was no attempt by governments to consult or negotiate about the Sharbot Lake mineral claims. Aboriginal representatives blockaded the site to prevent Frontenac Ventures, (FV) the holder of the claims, from continuing its work. Although the Aboriginals argued for their right to be consulted, the court issued the injunction requested by the company preventing those leaders from protecting their land and interests. When the Aboriginals refused to obey the court order, they were sanctioned. Robert Lovelace was heavily fined and sentenced to six months in jail; Co-Chief Paula Sherman and the Ardoch Algonquins were also fined; others faced other sanctions insisted on by FV. [ was this part of the inquiry or should it go in the history? Chief Doreen Davis of the Shabot Obaadjiwan First Nation, went on file a statement of defense, counterclaim and cross claim against the Province of Ontario and the Federal Government. ]

**"Many presenters acknowledged the leadership role that Aboriginal people played in protecting the environment and in advocating for principles of natural law. Some of the presentations were highly emotional and deeply heartfelt. Presenters expressed a passion for protecting the environment and future generations. They expressed concern that nuclear development leads to gross insecurity nationally, globally and personally."**
**Lorraine Rekmans,**
**Panel Member.**

On May 28, 2008, the Ontario Court of Appeal released Mr. Lovelace with time served, and fines were suspended.

Given the decisions of the Supreme Court of Canada, in regard to the requirement to consult and accommodate, it would seem reasonable to expect governments to abide by that precedent, but that has not occurred in this case. It appears that the Ontario *Mining Act* trumps the decision of the senior courts.

In their statement of September 28, 2007, the Algonquin chiefs specifically singled out uranium exploration and mining as posing a "great threat to the health of the land, water, people, and fellow creatures of the Algonquin homeland." Uranium activities are seen to be different in quality to mining for other minerals. It is worthy of note that the First Nation bands have not attempted to stop any other form of development, only uranium exploration.

**"Aboriginal land claims and traditional rights should be a major consideration in determining mining exploration, but these seem to be ignored in current situation causing major concern for the native bands and their leaders as well as all concerned citizens in the area leading to heightened tensions in the community. Provincial and federal governments do not seem to be engaged in trying to find solutions other than legal actions through courts and police."**

**Fraser McVie,**
**Panel Member.**

Aboriginal values must be addressed. As noted in the federal government's recent apology regarding residential schools, and in the establishment of a reconciliation commission, it is appropriate to proceed with a different spirit in reconciling and resolving differences between cultures. This provides another reason for seeking a moratorium on the exploration and mining of uranium – it permits a process of reconciliation to begin. The moratorium would also be a symbol of the government's good faith.

**Recommendation #7:**
The Ontario government enact a law declaring a moratorium on the prospecting and mining of uranium in Ontario in order to permit alternatives to be explored for the use of uranium as noted in recommendation 4 and so the province may indicate its good faith and proceed with dispatch to achieve reconciliation of claims to land rights with First Nations in areas where there are uranium ore deposits.

Given the impacts of uranium exploration and mining beyond the property on which these acts occur, it is important to state that the moratorium also extends to prevent an owner, First Nation, or government from allowing such activities by consent.

The problems respecting Aboriginal land claims and mining extend beyond the exploration and mining of uranium, as the court decisions note. Senior governments must respond appropriately.

**Recommendation #8:**
The province forthwith begin discussions with the federal government to ensure that the Supreme Court of Canada decisions respecting discussions and negotiations with First Nations are incorporated into proactive operating practice by the relevant officials of both governments.

**F. Consolidation of recommendations in this report**

1) That, on an interim basis, the provincial government enact a new policy or law stating that a prospector may not enter on First Nations land or privately owned land and prospect or stake out that land without the signed consent, freely given, of the owner(s) of that land.

2) That the province undertake a broad public review through a body such as a royal commission into the *Mining Act*. Issues should include mining and prospecting provisions in other jurisdictions; methods to make the *Act* relevant to today's society; its relationship with other legislation and policies including those related to environmental protection and to municipalities. Further, that this review be open, transparent, and accountable, and led by individuals who evoke public trust. And from the report of this body the province enact new laws and policies for the new century to better serve public and private interests in Ontario.

3) The provincial government contract for and fund several definitive independent professional studies of residents in places where uranium has been processed such as Port Hope, Blind River, and Chalk River, to determine the actual impacts of uranium on human health.

4) Since new nuclear power plants will not be in operation until 2018 at the soonest and a shortage of electricity is projected to occur by 2013, and because of their negative impacts, the province not proceed with plans for new nuclear power plants.

**"A few decades hence, we'll have wished that we'd moved to alternatives sooner, because at that point our children and grandchildren will have been left to contend with more radioactive hot spots, more illness, more gene damage, and the possibility of more nuclear disaster and debt."**
**From letter of Donna Dillman to Premier McGuinty, October 27, 2007, during her hunger strike.**

5) The province undertake a broad public review

that is transparent and accountable, and led by individuals who evoke public trust, through a body such as a royal commission into the alternatives to the use of uranium for medical purposes, particularly radioisotopes.

6) That the $40 billion allocated to new nuclear plants be reallocated to reducing energy use, expanding sustainable sources of energy, and instituting a transition fund for those employed in and living in the communities relying on nuclear power. And that Ontario's existing nuclear power plants be phased out as alternative energy sources become available.

7) The Ontario government enact a law declaring a moratorium on the prospecting and mining of uranium in Ontario in order to permit alternatives to be explored for the use of uranium as noted in recommendation 4 and so the province may indicate its good faith and proceed with dispatch to achieve reconciliation of claims to land rights with First Nations in areas where there are uranium ore deposits.

8) The province forthwith begin discussions with the federal government to ensure that the Supreme Court of Canada decisions respecting discussions and negotiations with First Nations are incorporated into proactive operating practice by the relevant officials of both governments.

***

References

These references cite material with a direct relationship to a particular submission so that the reader can verify where the information was sourced. Submissions may be found at www.uraniumcitizensinquiry.com Not every submission that contained similar information is referenced here.

Introduction: what the hearings did: Judith Matheson

A. The Impact of Claim-Staking and Exploration
General information about the *Mining Act:* Charles Ficner; Marilyn Crawford
a) Context. See H.V. Nelles, *The Politics of Development: Forests, Mines, and Hydro-Electric Power in Ontario, 1849 – 1941.* Toronto, Macmillan. 1974. Page 46.
b) Disputes. References to the cases cited: see Marilyn Crawford.

B. Impacts of Mining Uranium
a) Uranium daughters: Pembina Institute, "Uranium Mining," Fact Sheet No. 2, May 2007; Helen Caldicott, *Nuclear PowerIis Not the Answer.* The New Press, London and New York, 2006. Chapter 3.
b) Development of a uranium mine. Approval process: Mississippi Valley Conservation.
c) Waste rock and tailings. "Uranium Mining and Social Justice: Developing a new diplomacy", Queens University students; Bill Adamson, "Context for Mining Uranium in Saskatchewan (1)"
Radioactivity of tailings: questioning by the Kingston panel of Paul Robinson of Southwest Research and Information Centre, www.sric.org , see particularly, http://www.sric.org/uranium/1979_SRIC_URANIUM_PRIMER.pdf .
d) Health risks
Air contamination: Pembina Institute, "Clearing the Air about Nuclear Power", May 2007.

Health Risks: Helen Caldicott, *Nuclear Power Is Not the Answer*. The New Press, New York and London, 2006. Chapter 3.
Water contamination: Andrew Johncox; Kawartha Community Midwives.
Madawaska Mine: Michele Proulx, "The Uranium Mining Industry in the Bancroft Area".

C. The Uses of Mined Uranium
a) Processing ore: Brennain Lloyd, Northwatch, April 22, 2008; Andrew Johncox.
Blind River and Port Hope: James Harding, "ONTARIO: At the centre of Canada's Unsustainable Nuclear System".
Port Hope history and study: Port Hope Community Health Concerns Committee, Faye More.
b) Medical isotopes: Gordon Edwards, April 28, 2008; Gordon Edwards, Mining Watch, December 10, 2007
Australia cyclotrons: Brinoy Penn; and, a report from the Australian Senate at http://www.aph.gov.au/senate/committee/economics_ctte/completed_inquiries/1999-02/lucas/report/c05.htm .
c) Electricity, Safety: Georgui Kastchiev et al., *Residual Risk: An Account ofEevents in Nuclear Power Plants since the Chernobyl Accident in 1986*, commissioned by Rebecca Harms, Member, European Parliament, chapter 10
Electricity, Reliability: Doug Smith, citing Amory B. Lovins et al., Rocky Mountain Institute, "Forget Nuclear."
Electricity, Green House Gases: Pembina Institute, "Clearing the Air About Nuclear Power"

d) Weapons: *Bomb Scare, The History and Future of Nuclear Weapons*, Joseph Cirincone, Columbia University Press, 2007. Chapter 8;
Depleted uranium: Qais Ghanem, "Health Hazards of Uranium"; Steve Beckow.

D. Alternatives to Uranium
Energy alternatives: Amory Lovins et al., Rocky Mountain Institute, "Forget Nuclear".

**

Thanks.

Thanks to all presenters, and others who filed briefs in the inquiry; to the panel members and the important role they played; to the organizers of the sessions; to those who have participated in the many events surrounding these matters in the last twenty months; to those who provided support; to John Sewell for assistance in writing this report.

**

Appendices:
1. Municipal support
2. A note on the hearings
3. Presenters
4. Panel recommendations
5. Key events: removed

***

**1. Municipal support**

To date, twenty municipal Councils, responsible for governing about one million people, have passed motions petitioning the province for a moratorium against uranium mining and/or for substantive changes to the Mining Act:

Cities of Ottawa, Kingston and Peterborough; Counties of Lanark, Frontenac and Haliburton; Towns of Carleton Place and Perth; Townships of Lanark Highlands, North

Frontenac, Central Frontenac, South Frontenac, Tay Valley, Beckwith, Mississippi Mills, Drummond/North Elmsley, Dysart et al., Algonquin Highlands, Minden Hills, and Highlands East. Update January 2009: add City of Kawartha Lakes and Peterborough County.

**2. A Note on the hearings**

The Community Coalition Against Uranium Mining (CCAMU) is a grassroots organization formed in response to the proposed exploration for and development of a uranium mine north of Sharbot Lake and upriver of Ottawa. CCAMU held The Citizen's Inquiry into the Impact of the Uranium Cycle from claim-staking and exploration to mining, through to enrichment, power generation, weapons potential and to spent fuel rod disposal.

Members of the public were invited to make their views known at forums with both afternoon and evening sessions, held as follows:

Tuesday, April 1, St. Andrew Anglican Church, Sharbot Lake,
Tuesday, April 8, Queen Street United, Kingston
Tuesday, April 15, Sadleir House, Peterborough
Tuesday, April 22, Rideau Park United Church, Ottawa.

Presentations made in person at the inquiry sessions included written material, oral presentations with slides, audio and video formats, poems, plays, skits and songs. Participants were invited to share their experiences, thoughts, concerns, knowledge and expertise on issues and facts related to the uranium cycle.

**"The quality of presentations was very good, heartfelt and sincere. In particular the poetry and songs that were presented were very well done and moving. There was a common theme, that is: respect the environment and prevent mining activities that would threaten that environment for future generations."**

**Fraser McVie**
**Panel Member.**

There were a total of 230 written submissions, and 157 presentations, the latter limited to ten minutes. The role of panel members was to hear presentations from those appearing before the Inquiry and to do so objectively. Panel members had an opportunity to ask questions of clarification of the presenters, during a 30 minute period at the end of each afternoon and evening session. Panel members prepared oral and written comments, including observations, a summary of the content of presentations, and their own recommendations.

**Panel members:**

**Marion Dewar**: Ottawa mayor from 1978 - 1985, MP from 1986 - 1988; former Chair of Oxfam Canada and the Ottawa-Carleton Police Services Board; 2002 recipient of the Order of Canada. Marion has been politically active and volunteers her time for many community pursuits.

**"The fact that the Citizens Inquiry attracted a significant number of people to Sharbot Lake in the daytime on a weekday is clear indication that the current situation has touched a nerve. I feel it is significant so people are prepared to take time out their lives to try and influence the outcome."**

**Janet Gutowski,**
**Panel Member.**

**Janet Gutowski**: Mayor of Central Frontenac, with nine years experience as a councillor - six in the City of Thorold and three in the Township of Central Frontenac; an advocate for sound planning and sustainable economic development, has been active in supporting the work of lake associations and community groups.

**Fraser McVie**: retired from senior positions in the Canadian justice system; helped develop modern and humane approaches to corrections based on rehabilitation and treatment; extensive experience in international projects and peacekeeping, including work as an expert with UN Interim Mission in Kosovo.

**Rev. Laurie McKnight-Walker**: served in the United Church ministry for 24 years; four years Queen St. United Church, other ministry mostly in rural communities in Ontario where agriculture/lumber/nuclear industry/military were the key economic realities; served on several community boards in Kingston -Community Chaplaincy, Social Issues Networking Group and Hospice Palliative Kingston.

**Lorraine Rekmans**: born in Elliot Lake, ON; of Ojibwa-French descent; member of the Serpent River First Nation; co-editor of *This Is My Homeland*, a book that captures the experiences of the Serpent River First Nation; a witness at the World Uranium Hearing at Salzburg, Austria.

**"Ms. Thau-Eleff performed her poem at the morning session, and again in the afternoon. On both occasions there was sustained applause. Her performance was an eloquent expression of the very deep emotion that the drilling plans have stirred. It is a level of emotion difficult to convey adequately in the words of an inquiry report."**

**Cameron Smith**
**Panel Member.**

**Cameron Smith**: writer of the *Toronto Star*'s environmental column for 12 years; former managing editor of the *Globe and Mail*; a two-time winner of a National Newspaper award; best-selling author of *The Lewis Family, An Unfinished Journey*; has worked as a hardrock miner and as a lawyer.

**Jamie Swift**: has worked independently, writing books, magazine and newspaper articles and reviews for over 25 years; has been a regular contributor to CBC-Radio's Ideas; a lecturer at Queen's University School of Business.

**Radiate**

**I do NOT want**
**My children splashing their feet in uranium laced water**
**I do NOT want tainted carrots pulled from the earth,**
**Miles downstream from your toxic open pit mine**
**Wild rice scattered on a toxic shoreline....**

**I do NOT want Bonnie Raitt to keep booking one more concert,**
**One more benefit,**
**Her blue eyes filling with tears of rage**
**For twenty-nine years, she has sung against nuclear energy,**
**Sung against the poison, the devastation, the practices of companies like Frontenac Ventures....**

**I want children who can eat and drink from our land,**
**Who don't have to suffer from**
**birth defects**
**liver failure**
**lung cancer**
**From the uranium, from the tailings,**
**From the water, from the air**

**I do not want you to tear up the trees,**
**Dig up the land,**
**Drill into the earth.**
**It is not your right to**
**Terrorize the holy ground of our Algonquin brothers and sisters**
**It is NOT *your* land to drill....**

**It's time we all started respecting our mothers.**
**It is Mother Earth who provides us water,**
**And it is women's work to protect it.**

**Native culture lets the women speak.**
**So I am here to say, it is the government's job to listen.**
**It is every woman's job to protect the water.**
**So here I lie, prostrate on the riverbank,**
**Tears dropping into the watershed,**
**Telling you, I am here to protect the water.**
**And I'm**
**not**
**going**
**anywhere."**

**Performed by Maya Thau-Eleff**

**3. Presenters**

**Sharbot Lake:**
Jocelyne Steeves, Pamela Giroux, Larry McDermott (Shabot Obaadjiwan First Nation and Plenty Canada), Helen Crowe, Joel Klassen (Christian Peacemaker Team), Carmi Gallant, Helen Forsey, Elizabeth Nielsen, Ph.D., Dave Neilsen, Gerry Ackerman, Shabot Obaadjiwan Chief Doreen Davies, Earl Badour Sr. (Shabot Obaadjiwan First Nation), Emily Conger (A2A-Algonquin to Adirondacks Conservation Association), Howard Robinson (Mississippi Valley Field Naturalists & Buckshot Lake Cottage Association), Bob Miller, Sulyn Cedar, Steve Kotze, Andy Fisher, Willa Murray, Frank Morrison, Marilyn Crawford, Don Hanam, Maren Molthan (Peacework Band), Ardoch Algonquin Acting co-chief Mireille LaPointe, John Drozdowski, Winnifred Spuehler, Oskar Graf (Blue Skies Cultural Community Center), John Kittle (CCAMU), Martina Field, Steve Rymal, Mary Stinson, Larry Lightstone, Ken Fisher, Terry Tufts, Dwain Scudder.

**Kingston:** The Three Sisters, Ellen Hamilton, Jan Laurey and Michelle Girouard, Bert Horwood, Joan Rose, Ross Sutherland, Sandra Willard, George Biros, Marilyn Crawford, David Morrison, Bridget Doherty, Eric Walton, Wolfe Erhlichman, Ivan Stoiljkovic, Maya Thau-Elef, Coreen Covet, Peter & Ann Burbidge, Courtney Kirkby on behalf of Stefan Seum's, Jeff Colden,

Jo/Anne Antoine, Molly Wallace, Mike Nickerson, Ardoch Algonquin Acting co-chief Mireille LaPointe, Susan DeLisle, Tim Sietz, Karen Raddon, Jean Gower, Charles Ficner, Andy Hill, Kate Maddigan, Kathryn Langley, Jan Laurie, Jerry Stein, William Payne, Peter Dundas, David Gill, Anne Joss, Art Lay, Tara Bowen, Rob Matheson.

**Peterborough:**
Mark Winfield, Christine Artill (FUME), Robin Simpson (FUME), Mike Nickerson (The Sustainability Project), Siren Sounding the Alarm, Heather Ross (Environment Haliberton), Bruce Cox (Executive Director of Greenpeace Canada) Professor Paula Sherman (Co-Chief of the Ardoch Algonquin First Nation), Julie Caron, John Miller (Families Against Radiation Exposure), Rachel Edge (Trent U Mural Group), Doug Smith (Green Party of Ontario), Kathryn Langley (SAGE), Dan Rudka, Linda Harvey (CCAMU), Raging Grannies, Kawartha World Issues Centre, Marion Burton (Occupational & Environmental Health Coalition), Corinne Mintz, Carol Winter (SAGE, Ploughshares), Steve Sharpe (NDP), Angel Hamilton, Marianne Pedretti, Michael Ketemer, Andrew Johncox, Faye More, Tom Lawson (for himself and on behalf of his daughter Molly Malloy), Pat Lawson, Peter Tabuns (MPP, NDP Environmental Critic), John Etches (SAGE), Susan Howlett (Kawartha Community Midwives), Roy Brady (SAGE), Richard Tyssen, Greg Roy, James Wilkes, Frank Morrison, Erin Parker.

**Ottawa:**
Mirielle Lapointe on behalf of jailed Algonquin Elder, Robert Lovelace, Roger Peters )The Pembina Institute), Dr. Gordon Edwards (CCNR), Bruce H. Moore, (Director of the International Land Coalition (ILC)), Dr. Chris Busby, Ph.D., Stephan Hazell (The Sierra Club Canada) Rosemary Taylor (OCAMU), Linda Harvey (Physicians for Global Survival), Bob Stevenson, Lisa Gue (David Suzuki Foundation), Kelly O'Grady (First Six Years), Paul Dewar, (NDP MP Ottawa Centre), Gloria Morrison, Brennain Lloyd (Northwatch), David Shackleton, Charles Ficner, Joan Kuyek (Mining Watch Canada), Ed Burt, Andrew MacDonald, Meg Illman-White (United Church of Canada), Kim Scott, Paul Gibson, Jane Gibson, Derek North, Peggy Land (OCAMU), Linda Kinsella, Ivona Vujica (Paradigm Shift Environmental Alliance), Eyah-Arnold Saulteaux, Qais Ghanem, Kevin Kinsella, Michael Patenaude (West Quebec Community Coalition Against Mining Uranium, Richard Cuyler, Karen Markle (National Farmers Union of Ontario, Local 1), William Terence Tufts, David Gill (OCAMU), Jeremy Wright, Ken Billing (ACTcity), Frank Morrison, Michele Bourque.

The complete list of submissions can be found at www.uraniumcitizensinquiry.com

**4. Panel recommendations**

After due consideration, the panel members made recommendations on the basis of the forums held and submissions they received. These were consolidated into the following recommendations, which are reflected in somewhat more concise form in the report flowing from the hearings.

**1) To the Ontario Government:**

a) Consider establishing an immediate task force to:

i) undertake a review of the concerns and issues of the aboriginal peoples, local citizens and municipalities in South Eastern Ontario,

ii) mediate an approach to address the immediate and longer term concerns which may, in the short run, be an opportunity to stop or minimize exploration risks while the larger issues are examined.

iii) In particular, the environmental and safety concerns raised must be answered in a transparent and complete manner.

This recommendation is fully consistent with the stated goals and objectives of the Ontario Government as stated on the Ministry of Northern Development and Mines web site.

b) Immediately announce a process of amendments to the Ontario Mining Act that would address the clear lack of environmental oversight and surface owner rights in the current legislation. Amendments should include:

a) the elimination of free access;

b) before a claim is accepted for registration, there must be free, prior, and informed consent from affected individuals and communities;

c) exploration, development, and mining interests be required to observe water source protection plans;

d) areas designated as environmentally provincially significant be exempt from exploration and mining, just as they are from any other form of development;

e) exploration and mining be required to conform with municipal official plans and bylaws;

f) exploration, development or mining companies (or individuals) be required to ensure in advance that all sites will be restored to clean and safe conditions after activities have ceased.

g) permits be required at each stage of mining exploration and development before activities are undertaken;

c) Revise the Mining Act and the Ontario Environmental Protection Act to require regular monitoring and testing to determine whether uranium tailings are contaminating groundwater and air;

d) Seek a speedy reconciliation with the First Nations regarding exploration and mining in their territory.

As a prelude to any such reconciliation, the Ontario Government should:

a) stipulate that it will require Frontenac Ventures to abide by the recommendations offered here for amending The Mining Act, until such time as these recommendations are incorporated into the Act;

b) Impose a moratorium on drilling for uranium in North and Central Frontenac;

c) Require an environmental assessment to be undertaken should Frontenac Ventures proceed with plans to drill for uranium in North and Central Frontenac.

d) Revise the Ontario Provincial Policy Statement to incorporate the precautionary principle.

e) Revoke the amendment that releases mining exploration and development from having to undergo environmental assessments.

f) Revise The Ontario Clean Water Act to extend the Act's provisions to private wells; and to adjust the manner of calculating the score for assessing water quality risk so that it more accurately reflects contamination in highly vulnerable areas.

**"Participants in the citizens inquiry believe that a critique of and challenge to the existing policies regarding the mining of Canadian land, should not result in criminal charges being laid against individuals acting in good conscience. Our hope is that these important discussions can occur outside of the legal system and through open and democratic debate, respecting the voices of those who disagree with current government policies. Collectively, there was a sense of shared outrage both by the native speakers in attendance as well as from non-native (settler) speakers, that native people in particular who have protested exploration for uranium on their land have been singled out for punishment by the legal system."**

**Laurie McKnight Walker,**
**Panel member**

e) The Ontario government must revisit all land use planning processes to ensure they are consistent with current Supreme Court decisions that call for consultation with Aboriginal peoples. All land use planning processes in Ontario must consider environmental, social, economic and cultural impacts.

f) The Ontario government must devise a more comprehensive land use planning process that is able to provide a suitable balance among Aboriginal rights and concerns, public preferences, competing uses and anticipated implications within an overall context of sustainable development and ecological sustainability. The primary purpose of land use planning processes must be to support the conservation and wise management of Ontario's natural resources.

g) The Ontario government must ensure that environmental protection is the cornerstone of all provincial land use planning decisions and processes. Revenue generation must be weighed in accordance with all other social, environmental and cultural impacts.

h) The Ontario government must not infringe Aboriginal and treaty rights in all land use planning decisions.

i) There should be consultation with other ministries and municipalities before exploration for uranium.

**2) To the Federal Government:**

a) Require the reporting of contents in uranium tailings impound areas under the National Pollutant Release Inventory.

b) Health Canada must undertake epidemiological research to assess the health of people living in and near communities with nuclear facilities (refineries, mines, tailings repositories, processing plants, reactors, sulphuric acid plants and including exposures to depleted uranium in military applications), to determine impacts resultant from exposure to radioactive contaminants.

c) Health Canada must conduct baseline health research to establish the health of a community considered to be the location of any new nuclear facility as part of an environmental impact assessment.

d) Because radon gas is a known carcinogen and was responsible for more than 1,500 lung cancer deaths in 2001, Health Canada must undertake to establish limits of human exposure to radioactive materials including radon gas and establish personal registries to begin tracking all exposures from all sources to ensure Canadians do not receive doses in excess of national exposure limits.

**"The Inquiry heard of many cases of poor health caused by the uranium cycle. Therefore it is crucial that the public good must be taken into consideration rather than industry profit."**
**Marion Dewar, Panel Member**

Note: Health Canada has taken a number of steps to protect Canadians from the potential dangers of radon gas. These include evaluating measurement techniques, conducting research into effects of radon exposure and developing guidelines.

Health Canada's guideline for exposure to radon has always been based on the best available scientific evidence of health risk. In 1988, a guideline of 800 becquerels per cubic metre was established in Canada. After considering new evidence about radon

and the risk of lung cancer, Health Canada worked in partnership with the provinces and territories to develop a proposed new guideline of 200 becquerels per cubic metre, which is four times more stringent than the previous one.

e) there should be an official inquiry/consultation having authority with both sides presented; governments should hold inquiries, consultations or forums (potentially with power to subpoena witnesses) to have a more complete picture.

**3) To the Ontario and Federal Governments:**

a) Collaborate on appropriate joint actions necessary to ensure complete environmental protection in relation to all aspects of the exploration and mining of uranium including the early stages of prospecting on public and private lands.

b) Undertake health studies of communities in areas where uranium mining, milling and processing, nuclear processing and facilities are located.

c) The onus should be on government and industry to prove safety and take responsibility and liability for any uranium exploration/mining or nuclear production activity, before such activity is undertaken or expanded in keeping with the Precautionary Principle. This involves multiple ministries and agencies at both levels of government.

d) Governments must respect resolutions developed by First Nations with regards to their traditional territories, in accordance with the respect afforded Aboriginal and treaty rights in Section 35 of the Constitution of Canada.

Note: Treaties are international agreements between nations and are the most basic and fundamental rules of law in Canada. These agreements pre-date all other legislation and jurisdictions established during and after confederation.

**The precautionary principle was adopted at the Earth Summit in Rio de Janeiro in 1992 and stated:**
**"In order to protect the environment, the precautionary principle shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."**
**Cameron Smith, Panel Member**

e) Federal, provincial and Aboriginal governments must work in concert to resolve outstanding land claim issues in advance of any development or land use decisions.

f) Given that uranium production is the beginning of a process that ultimately leads to the production of nuclear weaponry, federal and provincial governments must develop

a public discourse forum for Canadians to input on Canada's nuclear energy future and provide direction to political leadership.

Note: The very nature of the nuclear industry makes it unique in that it is part of the nuclear weapons chain. As a result, mining uranium is unique in this regard when compared to other minerals developed in Canada. Canadians must be afforded the opportunity to input on Canada's future direction. Prime Minister Stephen Harper is currently lobbying internationally for Canada to participate in uranium enrichment despite a ban for new enrichment facilities that was agreed to under the Nuclear Non-Proliferation Treaty (1970). Canada is currently considered a non-nuclear weapons state; however, this status could change once Canada begins enriching uranium. Canadians must be afforded the opportunity to decide their future.

**Appendix 5: Key events -** removed

**Appendix 6: Health Risks, Safety and Weapons**

From a submission by Dr. Bill Adamson, Saskatchewan

> In March 2006, Dr. Geoffrey Howe, epidemiologist, updated and revised the Eldorado Miners Cohort study and found that among 17,660 early workers, that some 5372 cancer deaths were reported from 1955 to 1999, plus another 2335 cancer cases, plus 618 recent cancer deaths, with three quarters of the miners still living. In other words, the lung cancers among the uranium miners were 30% higher than that of the general population.
>
> An epidemiological study of 21,346 miners at several mine sites in the region of Elliott Lake and Bancroft in the Province of Ontario from 1932 till 1967 concluded that uranium miners were at three times the risk of lung cancer than the average citizen. It also concluded that lower doses of radiation were more hazardous that higher doses. (Kusiak, Ritchie, Miller, Springer, and Chovil—1993,1989,1981).
>
> Then in 2002 a further study was proposed to include a modern cohort of 12,000 workers from 1975 to 1996 to be called the Saskatchewan Uranium Miners' Study. Over the years mining regulations had been greatly improved to protect workers from radiation—ventilation, robotic measures, ore slurry in steel pipes, dosimeters, air control, limits to work hours, and mandatory low exposure doses. Nevertheless, the statistics were available to learn what was actually happening to our miners. However, this Part II portion of the Study was to be proceeded by a Feasibility Study. {However} the CNSC (Canadian Nuclear Safety

Commission—formerly the AECB or Atomic Energy Control Board) blocked the Study.

From a submission by Linda Harvey, M.D. on behalf of Physicians for Global Survival:

> Scientific evidence over the last 50 years shows that radioisotopes released in uranium mine tailings are some of the most toxic elements known to man. Microgram quantities inhaled into the lung guarantee an increased incidence of lung cancer. Exposure to low dose ionizing radiation via internal emitters not only causes cancer, but also has serious teratogenic and mutagenic effects on the populations exposed. It is a tragedy that Canadian health and regulating agencies have not done population studies in places like Elliot Lake and Port Hope. With the recent lowering of allowable radon gas standards, these studies are even more timely and vitally important to public health.

**Safety**

From a submission MEMORANDUM, by Dr. Gordon Edwards, Montreal:
{An accident occurred}

> "… in 1952 at Chalk River involving the NRX reactor (20 MW, much smaller than the NRU reactor) which was accompanied by explosions, evacuation, a million liters of radioactively contaminated water, and a totally destroyed reactor core. Hundreds of people (including future U.S. President Jimmy Carter) were involved in radioactive decontamination and cleanup work for months afterwards.
>
> There was also an accident at the NRU reactor in 1958 involving a 3-foot long portion of one fuel element, which caught fire and burned, spreading radioactivity throughout the NRU reactor building. This accident led to months of decontamination work involving hundreds of military recruits trucked in from Camp Petawawa and sent in to the reactor building wearing protective suits and respirators. One man, Corporal McCormand, forgot to attach the charcoal filter to his respirator on one occasion and ended up with throat cancer for which he got compensation (a pension). Another man, Corporal Paulson, had skin contamination during disrobing and suffered over a hundred operations for cancers all over his body, also caused by radiation exposure, for which he also received a pension."

From a submission, WHY NUCLEAR IS NOT HEALTHY FOR HUMAN OR OTHER LIFE, by Jim Harding, PhD. (prepared for 'Medicine and Survival", Physicians for Global Survival, Lake Couchiching, ON, March 28, 2008

> "For years the nuclear industry and government regulators have denied any deleterious effects from on-going low-level releases of radiation at nuclear facilities. However, as early as 1990 British research suggested that children of workers at the Sellafield (Windscale) nuclear reprocessing plant were twice as likely to get leukemia. Industry spokesmen adamantly denied this greater risk. However in 2002 research done by the Children's Cancer Research Unit at the University of Newcastle again raised the warning. Using comprehensive data from 1957-91 researchers found a *fifteen times higher risk of both leukemia and non-Hodgkin lymphoma among worker's children born at Seascale*, near the Sellafield plant. Children of Sellafield workers living outside Seascale and further from the plant had two times the risk for both illnesses.
>
> A similar trend is shown from French research. A 1997 study at Comte University of children frequenting the beaches near, or living within a 35 KM radius of the huge Areva nuclear plant at La Hague found leukemia rates above the national average. Industry officials predictably disputed this. Then in 2001 a study by the National Institute of Health and Medical research found more leukemia for people 25 years and younger living within 35 KM of the La Hague plant. *Children aged 5 to 9 living within 10 KM of the plant had a leukemia rate six times the national average*.
>
> The trend of such findings continues with German research. A 2007 study done for Germany's Federal Office for Radiation Protection, by the Institute for Medical Biostatistics, Epidemiology and Informatics at the University of Mainz, analyzed all 1,592 childhood cancer cases reported to the German Cancer Registry from 1980-2003. It found children under 5 living within 5 KM of any of the 16 nuclear plants had twice the risk of leukemia and a higher than average risk of other cancers. The researchers said "Our study confirmed that in Germany a connection has been observed between the distance of a domicile to the nearest nuclear plant…and the risk of developing cancer, such as leukemia, before the fifth birthday." …
>
> …Industry officials will continue to pick away at the methods and statistics, similar to the tobacco industry when it disputed any link between its product and lung cancer. However, a meta-study of 17 studies assessing proximity to 136 nuclear facilities in seven countries, including Canada, should put an end to nuclear industry disclaimers. This study, headed by statistician Peter Baker and published in the July 2007 *European Journal of Cancer Care*, found 14% to 21%

more leukemia in children nine and under. These children were 24% more likely to die of leukemia than those not living in the vicinity of a nuclear facility. These results are as available to nuclear industry spokesmen as to anyone else, as they were reported in a 2007 issue of *MacLean's*. …

…The most parsimonious explanation for the continual findings of higher leukemia and other cancers among children and others living near nuclear facilities, remains the radioactive emissions. The convergence of these findings in study after study should be more than enough to apply the *Precautionary Principle,* and not to expand nuclear power. But we know when money, power, weapons and ideology are so involved that *truth is cheap and sometimes even for sale*. And, as we see throughout human history, clinging righteously to self-serving myths stands in the way of enlightenment."

**Weapons**

From a submission: HEALTH HAZARDS OF URANIUM, by Oais GHANEM, MD

"Childhood leukemia has risen 600% in the areas [of Iraq] where DU was used. Stillbirths, births or abortion of fetuses with monstrous abnormalities, and other cancers in children born since [the Gulf War in] 1991 have also been found." Children in Afganistan are "born with no eyes, no limbs, tumors protruding from their mouths ... [and with] deformed genitalia." When a child is born in Iraq, according to Beyond Treason, the parents no longer ask, "Is it a girl or a boy?" They ask, "Is it normal?" Mid-wives are purported to have said they no longer look forward to births as.... "We don't know what's going to come out."

DU has a half life of 4.5 billion years, the same as the age of the Earth itself. It is a problem which, far from lessening over time, will likely increase by orders of magnitude as the DU particles travel around the globe.
DU travels globally on the winds. Within 7-9 days of the "Shock and Awe" campaign, very fine particles of DU were captured by filters 2400 miles away in Britain.

According to Dr. Leuren Moret, DU is everywhere. She advises that researchers have found the "smog of war" from Gulf War I in glaciers and ice sheets globally a year later. Large annual dust storms originating in North Africa, the Middle East, and Central Asia quickly spread the radioactive contamination around the world, and weathering of old depleted uranium munitions on battlefields and other areas will provide new sources of radioactive contamination in future years.

DU cannot be cleaned up. As Dr. Rokke reminds us, DU lasts for eternity and cannot be cleaned up. Dr. Moret calls it "the Trojan Horse of nuclear war, … the weapon that keeps killing. … There is no way to turn it off, and there is no way to clean it up."

There is no known treatment for DU contamination. According to Dr. Moret, "there are no known methods of treatment. Dr. Rokke concurs: DU is "going to cause all [kinds of] health problems and there is no medical care and treatment. You can't reverse radiation exposure damage to the body." Unlike in the first Gulf War, when 300 tons of DU were fired off in the Kuwaiti and Iraqi desert, in the second Gulf War nearly 10 times as much DU was largely exploded and burned in urban areas, putting the dust right in the path of millions of civilians.

And in case we are under the delusion that this is something that is happening far away: "Nearly 700,000 American Gulf War Veterans returned to the US from a war that lasted just a few weeks. Today more than 240,000 of those soldiers are on permanent medical disability = 30%; Over 11,000 are dead = 1.5%. In a US Government study on post-Gulf War babies born to 251 veterans, 67% of the babies were reported to have serious illnesses or serious birth defects, born without eyes, ears, had missing organs, fused fingers, thyroid or other malfunctions."

From a submission: WHY WE MUST NOT GO TO WAR WITH IRAN, Dr. Rosalie Bertell's comment from Steve Beckow and Cited in Dr. Moret, DEPLETED URANIUM: THE TROJAN HORSE OF NUCLEAR WAR< ibid.

"Our collective gene pool of life, evolving for hundreds of millions of years has been seriously damaged in less than the past fifty. The time remaining to reverse this culture of 'lemming death' is on the wane. In the future, what will you tell our grandchildren about what you did in the prime of your life to turn around this death process?"

**Appendix 7: A selection of titles to submissions to the Citizens Inquiry into the Impacts of the Uranium Cycle**

**Uranium & Daughter Products**

- Advanced Biochemical and Biophysical Aspects of Uranium Contamination by Chris Busby and Ewald Schnug
- The Problem with Nuclear is the Radiation by Bill Adamson
- Comparing the Nuclear Path with Lead Poisoning by Scott Leyland

• Nuclear and its Alternatives by Peter Johnston
• Eastern Ontario Rural Communities at Risk! by John Kittle
• The Radioactive Legacy of the Nuclear Age submitted by Gordon Edwards
• Why Nuclear Is Not Healthy for Human or Other Life by Jim Harding, Ph.D.
• Canada's Crisis with Medical Isotopes: Are we looking in the wrong place for a solution? by Briony Penn
• Toxic Trespass by Mike Nickerson
• What Uranium is Being Used For by Gordon Edwards
• Paul Robinson explains why 85 per cent of the radioactivity in the ore remains in the tailings, submitted by Marilyn Crawford
• Health Hazards of Uranium by Qais Ghanem, MD
• A Submission by Faye More on behalf of The Port Hope Community Health Concerns Committee
• A Submission from Tom Lawson
• Speaker's Notes for the Nunavut Planning Commission by Gordon Edwards Ph.D.
• Comments on the EIS for the Midwest Project by Gordon Edwards Ph.D.
• The Greens: European Free Alliance: click on Residual Risk and any others of interest, submitted by Mycle Schneider

**Mining & Processing**
• Why do members of the ICUCEC oppose the Midwest Project? by Bill Adamson
• Clearing the Air: Nuclear Power's Dirty Secret submitted by Roger Peters
• Radiation Doses for Uranium Mine and Mill Workers in Saskatchewan by Bill Adamson
• A Submission from the Canadian Association of Physicians for the Environment
• The Problem with Nuclear is the Radiation by Bill Adamson
• The World Uranium Hearing Submitted by Lorraine Rekmans
• Mined U: Financing of New Uranium Mines, submitted by Donna Dillman
• Uranium No a song by Coreen Covert
• Canadian Resource Sirens Sound the Alarm on the Impacts of the Uranium Cycle
• Recommendations from Environmental Haliburton! submitted by Heather Ross
• An Attempt to Make Points Not Previously Noted by Roy Brady
• Below the Surface by Bruce H. Moore on behalf of the International Land Coalition
• Canada's Crisis with Medical Isotopes: Are we looking in the wrong place for a solution? by Briony Penn
• Ontario's Mining Legislation Problems and Practical Solutions by Charles Ficner
• THE FORK IN THE ROAD by Jeremy Wright
• Facts about the Ontario Mining Act: The System of Free Entry by Marilyn Crawford
• Free Entry & The Mining Act by Marilyn Crawford
• Additional Considerations for Source Water Protection by Howard Robinson

• Thesis on History of Mining in Bancroft by Michele Groulx
• Do No Harm by Peter & Ann Burbidge
• Uranium Mining and Social Justice: Developing a New Diplomacy, submitted by Dana Kaluzny
• Paul Robinson explains why 85 per cent of the radioactivity in the ore remains in the tailings, submitted by Marilyn Crawford
• A Submission from Vera Bothé
• Uranium Mining, Your Ministry's Vision, and the Free-Entry System: A letter to the Minister for the Environment from Kate Maddigan
• Uranium Mining, the Free-Entry System, and Declaration Order MNDM-3/3: A letter to Premier Dalton McGuinty from Kate Maddigan
• Staff Report on Uranium Mining: Mississippi-Rideau Source Protection Committee
• Additional Considerations for Source Water Protection by Howard Robinson
• Uranium: Pros and Cons by Bert Horwood

**Waste**
• Why do members of the ICUCEC oppose the Midwest Project? by Bill Adamson
• The Risk of Radioactivity: An Intervention Regarding the EIS of the Midwest Project by Bill Adamson
• The Problem with Nuclear is the Radiation by Bill Adamson
• Tailings Impoundment Areas by Bill Adamson
• Nuclear Power by Hugh Perry
• Nuclear Waste Transporation & Storage by Donna Cuzze
• Wax: Documents submitted by William Nelson
• The World Uranium Hearing Submitted by Lorraine Rekmans
• OPEN LETTER TO ALBERTANS from Saskatchewan Neighbour, Jim Harding
• The Impact of Uranium Mine Tailings by William Nelson
• The Radioactive Legacy of the Nuclear Age submitted by Gordon Edwards
• What is being done about the waste from our nuclear plants? a submission from Donna Dillman
• What Has Happened to Canada? by Frank Morrison
• Nuclear: The "In" Issue by Jeff Colden
• A Submission from "The First Six Years" by Kelly O'Grady
• URANIUM SPEAKS by Peggy Land
• Canada's Crisis with Medical Isotopes: Are we looking in the wrong place for a solution? by Briony Penn
• Interesting Facts submitted by Eleanor Archer
• STRATEGY for Today by Pat Lawson
• NUCLEAR POWER SPEEDING UP GLOBAL WARMING by Ziggy Kleinau
• A Submission by Phillip Penna
• A Submission by Michelle Landry

• Uranium Exploration/Mining and the Nuclear Industry by Marion Moore
• A Submission by Andrew Johncox
• Paul Robinson explains why 85 per cent of the radioactivity in the ore remains in the tailings, submitted by Marilyn Crawford
• Economy and Catastrophe by Michael Ketemer
• A Submission by Faye More on behalf of The Port Hope Community Health Concerns Committee
• A Submission from Carol Winter
• A Submission from Tom Lawson
• The Nuclear Lobby by David Millar
• Thesis on History of Mining in Bancroft by Michele Groulx
• Uranium Mining and Social Justice: Developing a New Diplomacy, submitted by Dana Kaluzny
• Speaker's Notes for the Nunavut Planning Commission by Gordon Edwards Ph.D.
• Let's Phase OUt Nuclear Power in Quebec by Gordon Edwards Ph.D.
• What Has Happened to Canada? by Frank Morrison
• A Submission from Helen Derry and her Grade Six Class
• Comparison among different decommissioning funds methodologies for nuclear installations submitted by Mycle Schneider on behalf of the European Commission Directorate-General Energy and Transport

**Health & Safety Risks**
• Non-Nuclear Testimony by Bill Curry
• The Risk of Radioactivity: An Intervention Regarding the EIS of the Midwest Project by Bill Adamson
• Clearing the Air: Nuclear Power's Dirty Secret submitted by Roger Peters
• Renewable is Doable submitted by Roger Peters
• Radiation Doses for Uranium Mine and Mill Workers in Saskatchewan by Bill Adamson
• Uranium: Social Responsibility by Karen Richardson
• A Submission from the Canadian Association of Physicians for the Environment
• The Problem with Nuclear is the Radiation by Bill Adamson
• Comparing the Nuclear Path with Lead Poisoning by Scott Leyland
• Tailings Impoundment Areas by Bill Adamson
• Speaker's Notes for the Nunavut Planning Commission by Gordon Edwards Ph.D.
• Comments on the EIS for the Midwest Project by Gordon Edwards Ph.D.
• A Uranium Refinery for Saskatchewan? prepared by Bill Adamson
• A Submission from Kristina Calhoun
• The World Uranium Hearing Submitted by Lorraine Rekmans
• Memorandum from Gordon Edwards
• Uranium: Risks, The Mining Act, and Employment Opportunities by Elizabeth

Nielsen
• People were killed by Three Mile Island and other nuclear disasters submitted by Donna Dillman, with permission from Harvey Wasserman
• Mined U: Financing of New Uranium Mines, submitted by Donna Dillman
• Eastern Ontario at Risk! by John Kittle
• A Submission from Joan Rose
• Why Nuclear Doesn't Make Sense by Bridget Doherty
• Tritium Drinking Water Standard by Siegfried (Ziggy) Kleinau
• Uranium: Pros and Cons by Bert Horwood
• A Submission from Pamela Giroux
• My Concerns about the Nuclear Cycle by Shirley Farlinger
• The Age of Aquarius by Darlene Buckingham
• If we don't do the impossible, we shall be faced with the unthinkable by Tim Seitz
• Depleted Uranium a poem by Qais Ghanem, MD
• Literature and the Politics of Uranium by Molly Wallace
• Why Nuclear Is Not Healthy for Human or Other Life by Jim Harding, Ph.D.
• Recommendations from Environmental Haliburton! submitted by Heather Ross
• Not In OUR Backyard: Class-action in the Anti-Nuclear Age by Douglas smith
• A Submission by Marianne Pedretti
• The Experience of a Former Nuclear Energy Worker by Dan Rudka
• BC Moratorium by Cathy Walker
• The Petri Dish by Linda Harvey M.D.
• Prevention is the Only Cure by Susan Howlett on behalf of the Kawartha Community Midwives
• URANIUM: Too Hazardous for the Hazardous Waste Depot by Ursula Pflug
• Chemical Reform by Marion Burton on behalf of the Occupational & Environmental Health Coalition
• A Submission from "The First Six Years" by Kelly O'Grady
• URANIUM SPEAKS by Peggy Land
• A Submission by Michele Bourque
• Why We Must Not Go to War with Iran by Steve Beckow
• Donna Dillman's Letters to Premier McGuinty during her 68 day Hunger Strike
• The Danger of Complacency by Mike Nickerson
• The Problem of Denial by Mike Nickerson
• Organizational Self-preservation by Mike Nickerson
• Canada's Crisis with Medical Isotopes: Are we looking in the wrong place for a solution? by Briony Penn
• Toxic Trespass by Mike Nickerson
• Northeastern Ontario - On the Uranium Trail by Brennain Lloyd on behalf of Northwatch
• Energy Choices for Ontario by Molly Mulloy

• Water & Informed Consent by Ivona Vujica
• Quakers' (Friends') Submission from Colin Stuart
• A Submission by Jane Gibson
• Interesting Facts submitted by Eleanor Archer
• A Submission by Meg Illman-White
• A Submission by Bob Stevenson
• The Role of Integrated Environmental Impact Assessment for Mining Projects in Canadian Aboriginal Communities: A Systematic Literature Review of Current Trends and Challenges by James Wilkes
• Peasant Rights by Karen Markle on behalf of the National Farmers Union
• STRATEGY for Today by Pat Lawson
• Making YOU Pay for the Next Chernobyls in Advance!! submitted by Donna Dillman with Permission from Harvey Wasserman
• The Aspects of My Life That Uranium Mining Will Affect by Corinne Mintz
• Faith and Focus Can Move Mountains by Derek North
• A Submission by Jaylyn Wong
• THE FORK IN THE ROAD by Jeremy Wright
• A Submission by Phillip Penna
• A Submission by Michelle Landry
• A Submission by Linda Harvey, M.D. on behalf of Physicians for Global Survival
• 10 Strikes against Nuclear Power by Carmi Gallant
• A Submission by Andrew Johncox
• False Statements and the Interconnectedness of Uranium Fuel Cycle Issues by John Etches
• Economy and Catastrophe by Michael Ketemer
• A Submission from Michael Patenaude
• Health Hazards of Uranium by Qais Ghanem, MD
• A Submission by Faye More on behalf of The Port Hope Community Health Concerns Committee
• When is anyone going to listen? by Cathy Duchene
• A Submission from Carol Winter
• Good Things Grow in Ontario cartoon by Dave Jehu
• RISK: Nuclear Standards applied to Cameco in Port Hope by Pat Lawson
• A Submission from Tom Lawson
• A Submission from Mireille LaPointe
• Additional Considerations for Source Water Protection by Howard Robinson
• The Nuclear Lobby by David Millar
• Safety Concerns with MAPLE and ACR reactors not the same by Dr. Gordon Edwards
• Do No Harm by Peter & Ann Burbidge
• Uranium Mining and Social Justice: Developing a New Diplomacy, submitted by

Dana Kaluzny

- Hallelujah, a Song by Jeff Woods [right-click and save to your computer]
- Why We Need Nuclear Power by John K Riley
- A Submission from Leslie Thurston
- Nuclear Disaster by H. Holloway
- Let's Phase OUt Nuclear Power in Quebec by Gordon Edwards Ph.D.
- Staff Report on Uranium Mining: Mississippi-Rideau Source Protection Committee
- A Submission from Uranium Free Kootenay Boundary by Laura Savinkoff
- Additional Considerations for Source Water Protection by Howard Robinson
- The genius doctor who diagnosed Nuke Power's deadly disease submitted by Donna Dillman, with permission from Harvey Wasserman
- Letter Concerning Nuclear to Bancroft This Week from Stu Vickars
- The Greens: European Free Alliance: click on Residual Risk and any others of interest, submitted by Mycle Schneider
- A Submission from Helen Derry and her Grade Six Class
- The Lessons from Port Hope by John Miller