KEEP B.C. NUCLEAR FREE

Stop Uranium Mining

By John Moelaert

Plans to mine uranium in B.C. were first revealed in 1977. Public opposition grew very quickly. In response the Government of B.C. in September, 1978, ordered the formation of the Royal Commission of Inquiry into Uranium Mining. Evidence presented to the commission made it increasingly clear that uranium exploration, mining and milling pose major health and environmental risks. On February 27, 1980, the government ordered the early termination of the commission and the start of a seven-year moratorium on uranium exploration and mining. The ban was not renewed when it expired in 1987. This pamphlet was produced to show why the uranium ban should be reimposed.

WHAT IS URANIUM?

Uranium is a radioactive metal. It is softer than iron and more common than silver and mercury. It is found in many parts of the world. Most of the world's uranium is found on land inhabited by native people. For example, Aboriginal land in Australia, Navajo land in New Mexico, Native Indian Habitat in Northern Saskatchewan and Namibia in Africa. Canada has about 20 per cent of the world's known uranium reserves. Uranium was first discovered in Germany in 1789. Until the early 1940's it was considered a worthless mineral. Uranium emits radioactivity and sequentially changes into other radioactive elements. After 14 such changes uranium becomes lead. Some of these changes take only a few minutes. Other take many thousands of years. The first conversion phase in this decay process changes uranium -238 into thorium-234. It takes 4.5 billion years (the estimated age of the earth) for half of a given amount of uranium-238 to change into thorium-234 and only 24 days for half of it to change into protactinum-234. The time it takes a radioactive substance to lose half its radioactivity is called a halflife. The two best known elements in this decay series are radium-226 and radon-222

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RADIATION RISKS

Uranium and all its decay products, except lead, emit ionizing radiation. This form of radiation produces waves or particles capable of changing the electrical charge of atoms and the structure of cells: the building blocks of all life.

When human cells are damaged by radiation, cancer or birth defects may result. Recent discoveries show that all exposure to radiation is potentially harmful. Generally, the greater the radiation dose and the longer the exposure, the bigger the biological risk is. Moreover, the effects of radiation are cumulative and may not manifest themselves as cancer until up to 25 years after exposure.

Radiation is often measured in units called rems (Roentgen Equivalent Man). Usually exposure is expressed in terms of mrems (milli-rems, one thousandth of a rem). When figures are added to this scientific term it becomes an easily understood means of comparing rates of exposure.

For example, the average Canadian is exposed to about 100 mrems a year from unavoidable sources such as cosmic radiation. Air travel exposes a person to about one mrem per hour. A chest x-ray is about 50 mrems, provided the x-ray equipment is working with maximum safety efficiency which is not always the case.

The so-called 'acceptable level' of exposure for nuclear workers in Canada has been set at 5,000 mrems, the equivalent of a chest x-ray every third day of the year! U.S. Army personnel who were exposed to far less radiation during atom bomb tests in Nevada, have since developed a leukemia rate four times the national average, according to the Journal of the American Medical Association.
Radiation cannot be detected by any of the human senses. Perhaps more important is the fact that modern science can create radiation, but it cannot eliminate it.

URANIUM IN B.C.

In the late 1970's uranium prospectors were swarming all over B.C. Some called it a radioactive gold rush... In 1977 Rexspar Minerals and Chemicals Ltd. announced its intention to open B.C.'s first uraniummine at Birch Island (Appr. 120 km north of Kamloops). On Dec. 18 of that year some 800 people attended a stormy meeting at nearby Clearwater to debate the plan. Public opposition to uranium mining quickly spread across B.C. It was particularly strong in Kelowna, Rock Creek, Genelle and Atlin all of which are situated near major uranium deposits.
Uranium exploration that involves trenching and drilling holes and the removal of ore samples is mini-mining. Though not as dangerous as uranium mining and milling, exploration nevertheless poses serious problems. It can contaminate sources of drinking and irrigation water, especially if a drill hole crosses an aquifer. Once ground-water is thus polluted with radioactive and/or chemical contaminants, people using such water are at risk.
Approximately half of all the uranium found in B.C. lies 80 km southeast of Kelowna. It is known as the Blizzard Property. The claim is owned by several companies, none from B.C., and headed by Norcen Energy Resources of Calgary. According to Norcen the ore body contains about 11 million pounds of uranium with an average concentration of two pounds per ton and a maximum of 140 pounds per ton.
In 1979 it was worth more than half a billion dollars. At 1987 prices it's worth slightly less than half that.
MINING HISTORY
Contrary to claims by government and mining officials that public opposition to uranium mining is based on unfounded fears, public concern is, in fact, strongly supported by scientific evidence. The point is we don't have to guess what would happen in B.C. if uranium mining were allowed, because we already know what has happened elsewhere after uranium mining took place.
The first major uranium discovery in Canada was made in 1930 by Gilbert Labine near Great Bear Lake in the Northwest Territories. There was no market for the uranium, but there was for the radium that was intermixed with it. The mine closed in 1940. Two years later the U.S. government asked the Canadian government to secretly reopen the mine and start extracting the uranium. It was subsequently used in the production of the atomic bomb that was dropped on Hiroshima on August 6, 1945, killing some 100,000 people. The nuclear age had begun.
The mine site eventually became known as Port Radium. As the new arms race escalated, uranium mining soon mushroomed worldwide. By 1987 there were eight uranium mines in operation in Canada: five at Elliott Lake, Ont. and three in northern Saskatchewan.
To understand the deadly consequences of uranium mining, you must understand the process:
First the uranium-bearing ore. is taken to a mill where the ore is crushed and uranium oxide (yellowcake) is separated from the rest of the ore: the so-called tailings. Eighty-five per cent of the ore's radioactivity remains in these tailings which are dumped near the mine site. These tailings contain, very dangerous radioactive substances, produced in the uranium decay process.
Scientists say it takes about 10 halflives for any radioactive substance to reach safe levels. One of the decay products is a gas: radon-222. Although its halflife is only 3.8 days, it is continuously replenished by radium-226 and is known to cause the high incidence of lung cancer among miners. Radon is inevitably inhaled after which it breaks down into other radioactive substances capable of changing healthy cells into cancerous ones. Mining uranium and crushing it during the milling process greatly increase the release of radon into the atmosphere. Radium-226 is so toxic that as little as one millionth of a gram can cause

leukemia or bone cancer according to the U.S. Academy of Sciences. Radium-226 has a halflife of 1,622 years. It is continuously produced by thorium-230 which has a halflife of 80,000 years. During the entire B.C. Royal Commission hearings, not a single piece of evidence was produced to show that uranium tailings can be safely contained. The nuclear industry is simply incapable of preventing these radioactive contaminants from escaping from the mine site into the environment for the time necessary. In the case of thorium-230 the required isolation time is 800,000 years!

LETHAL LEGACY

During the few decades that uranium has been mined, many ruptures of tailing dams have occurred. Such tailing spills, cause radium and other contaminants to get into the environment. Radium works its way up into the food chain in increasing concentrations. It is common for radium levels to be 500 to 1,000 times higher in algae than in the surrounding water. Saskatchewan studies show that downstream from uranium tailing ponds radium levels were 1,500 times normal in the flesh of northern pike and 11,400 higher in its bones. The Serpent River near Elliott Lake, which used to be a favorite place for sports fishing, has been so polluted that fish can not be found up to 55 miles downstream from the tailing ponds.

NEGLIGENCE AND SECRECY

Negligence and secrecy go hand in hand in the nuclear industry. Whenever errors are made or laws are broken, nuclear officials duck behind a cloak of secrecy.

The high incidence of cancer among Canadian uranium miners was long known by government and industry officials, but the information was kept secret from the workers and their unions for years. A medical report submitted to the Ontario Workmen's Compensation Board in 1969 showed that 16 of 20 uranium miners' deaths were caused by cancer, more than three times what it should have been. Incredibly this information became only public knowledge during an international conference in France, five years later.

In 1972 a top secret meeting was held in Paris between the governments of Canada, France, South Africa and Rio Tinto Zinc, the world's largest uranium mining corporation which operates three uranium mines in Ontario under the Rio Algom name. They conspired to artificially increase the price of uranium by forming a secret cartel. By doing so Canada broke its own Anti-Combines Legislation. The plot worked and the price of uranium shot up from $4/lb. in 1971 to $50/lb. by 1978 (the year of frantic uranium exploration in B.C.!)

NUCLEAR WEAPONS

Nuclear extermination is the diabolical recipe of mad science at its worst and uranium is the key ingredient! A single Trident submarine with its 24 missiles, each with 14 nuclear warheads, can destroy 336 major cities virtually anywhere in the world (There are only about 200 major cities in the Soviet Union as there are in the U.S.).

Missiles with pinpoint accuracy can deliver nuclear bombs at speeds of up to 32,000 km/hr.

The nuclear arms race is a race neither side can possibly win, but both can easily lose. It's killing people now through radioactive poisoning and the spending of billions of dollars, that could feed and educate the millions of poor and hungry among us.

On November 21, 1984 at the United Nations 111 countries voted in favor of a nuclear weapons freeze. Only 12, including Canada and the U.S., voted against it.

NUCLEAR POWER

The nuclear power industry was created as a public relations move to give a better name to nuclear technology which until then had only been, used to create weapons of mass destruction.

Both nuclear power and nuclear weapons are based on the same principle: the splitting of uranium atoms to create energy which manifests itself as heat.

In nuclear power plants this heat is used to change water into steam which then turns turbines and generates electricity. Although the technology of controlled nuclear fission is very complex, the principle is very simple: it's a fancy way of boiling water. Since most of the heat produced cannot be used, it's also a very wasteful technology. Somewhat like cutting butter with a chainsaw.
Nuclear power plants create various highly radioactive materials of which plutonium is the best known. It was named after the Greek god Pluto, the god of the dead! And deadly it is: plutonium is 20,000 times more lethal than cobra venom.
It remains deadly for about 250,000 years and science still does not know how to store it safely for such a long time. As little as a millionth of a gram is enough to give a human being lung cancer (which is 95 per cent fatal). The average nuclear reactor produces 500 pounds of plutonium a year.
There are 19 reactors at seven nuclear power plants in Canada which together produce less than two per cent of the energy consumed.

GROWING OPPOSITION

There have been very few times in B.C.'s history when public opposition grew as fast as it did on the uranium issue.
In less than a year public opposition to uranium exploration and mining had grown so strong that the B.C. government was forced to appoint a royal commission and ban uranium mining until the commission had completed its work. Only months earlier the government had said it would do neither.
By late 1978, about nine months after the memorable public meeting at Clearwater mentioned earlier, more than 100 organizations had gone on record opposing uranium mining in B.C. Some were small environmental groups, others were major organizations such as the B.C. Medical Association, the B.C. Teachers Federation, the Registered Nurses Association of B.C., the United Church and even the mining unions.
On February 27, 1980, former premier, Bill Bennett, who earlier had trumpeted uranium mining as a boon to the B.C. economy and personally promoted its sale in places as far away as South Korea, announced a seven-year moratorium on uranium mining and exploration. At the same time he terminated the Royal Commission before it had a chance to complete its work.
By 1987 the province had a new premier and a new government, neither of which had learned from the past experience. They refused to renew the seven-year uranium moratorium which expired on February 27 of that year. In the meantime opposition had grown and by this time even Kelowna's Social Credit MLA, Cliff Serwa and various municipal governments had joined. Resolutions opposing the lifting of the moratorium were passed by various city councils, including those in Grand Forks, Penticton, Summerland, Kelowna and Vernon. All regional districts in the Okanagan also passed similar resolutions.
It is interesting to note that during the 1986 B.C. election campaign Premier Bill Vander Zalm said in Grand Forks since there is "a perceived danger" in uranium mining, he would like to see a vote taken on such mining in the affected areas. No doubt so would the people, but the new uranium regulations, released 4 1/2 months later, contain no provisions for either public hearings or referenda.

INQUIRY & MORATORIUM

A 1978 proposal, supported by some 50 B.C. organizations, called for a public judicial inquiry to determine WHETHER uranium should be mined.
Instead the government instructed a pro-nuclear commission to determine HOW uranium should be mined! In spite of this obvious bias, the evidence submitted soon showed in embarrassing detail that mining companies were unable to mine uranium safely. In a sense the whole nuclear industry was on trial. It was a key factor in the premature cancellation of the Royal Commission.
The announcement was made February 27, 1980, barely 48 hours before a huge anti-uranium rally was scheduled to take place during the opening ceremonies of the B.C. Legislature.

Incredibly, the three members of the aborted commission then pleaded with the government for extra time to write their report on the basis of incomplete information. The time was granted. As a result of the termination of the public hearings expert witnesses were denied the opportunity to personally present evidence. The scheduled hearings on Social Impact, Ethical Considerations and Jurisdiction, Regulations and Enforcement were never held. Phases on environmental impact and public and worker health were not completed.
The commission's report was issued on October 30, 1980. Of its approximately 1,000 pages, 80 per cent comprises tables and appendices... With the filing of the report, the commission ceased to exist. It cost B.C. taxpayers $2.3 million.

INADEQUATE CONTROLS

The B.C. government's new uranium regulations went into effect on the expiry of the moratorium. The government described them as "stringent," but they are grossly inadequate.
For example:
1. Radium-226 isn't even mentioned, let alone regulated;
2. Public hearings are not called for;
3. Not a word about uranium mining and milling;
4. The industry is expected to report its own Infractions;
5. Radioactive contamination is not supposed to exceed 10 per cent above "average background level" but nothing is said how this can be accomplished and if it isn't, how it can be corrected;
6. Of the 50 pages, just under nine full pages are regulations, the rest are mostly claim numbers and forms. Some pages have only one word on them! It's a nice way to get bulk, but it does nothing for substance.
For uranium mining, the B.C. government relies on its Mine Development Review Process and the Atomic Energy Control Board. It is chilling to note that neither has specific uranium mining regulations. Regulations have been drafted, but they have not yet been approved by the federal government. By May, 1987 this still had not happened. Incredible as it sounds, the fact is that after more than 40 years of uranium mining in Canada, there are still no regulations covering this hazardous enterprise and no one appears to be willing to predict when this will change. When regulations will finally be approved will they be adequate? Almost certainly not, because the technology simply doesn't exist to mine uranium safely.

THE BOTTOM LINE

Neither this province nor indeed the rest of Canada needs B.C. uranium. In fact, more than 85 per cent of Canadian uranium is exported.
Even if one is sufficiently callous to disregard the health and environmental risks of uranium mining, one has to recognize that even economically it makes no sense. Using Norcen's own figures, it would take a maximum of 10 years to mine the Blizzard claim. The annual payroll would only be $2.6 million.
The Okanagan's two principal industries are tourism and fruit with an annual worth of more than $200 million. Why jeopardize these vital industries which can conceivably continue indefinitely, for a $2.6 million payroll that will last only a few short years? There is no market for radioactive fruit and dead fish don't draw tourists.
Finally, it is possible to insure almost anything in this world, but no insurance company will cover losses due to radioactive contamination (it's in small print in your homeowner's policy under Losses Excluded!) If insurance companies refuse to take the risk (including the government's own ICBC), should you?
So, the bottom line is you! If you arm yourself with the facts, write the premier, letters to the editor, join or start an anti-uranium group such as the Canadian Coalition for Nuclear Responsibility AND if there are enough of us, we will keep B.C. nuclear free.

The majority of the people of B.C. oppose uranium mining and won this battle in 1979. We can, we must win again. After all that's what democracy means: government that serves the public interest and uranium exploration, mining and milling are definitely NOT in the public interest.

ABOUT THE AUTHOR...

John Moelaert first became interested in nuclear issues as a journalist in 1961. Since then his articles on the subject have been published across Canada, in the U.S. and as far away as Japan.

He was a participant in the Royal Commission of Inquiry into Uranium Mining and wrote the report Uranium Mining is NOT in the Public Interest.

He has worked as a resource person on uranium for eleven organizations and the Government of the Northwest Territories.