

THE PROBLEM WITH NUCLEAR IS THE WASTE

“Waste not, want not!”

**By Graham Simpson, Professor Emeritus,
University of Saskatchewan, Nov. 2006.**

Uranium mines and mills and Waste Management Areas

“Based on available data concerning the effects (from both exposure to uranium and ionizing radiation) of releases of radionuclides from both uranium mines and mills, and waste management areas, it has been concluded that these releases are entering the environment in quantities or concentrations or under conditions that have or may have an immediate or long-term harmful effect on the environment or its biological diversity” (Environment Canada, July 2002.) (1)

Wow ! This sounds exactly the opposite of what the uranium mining industry claims about how it is ‘protecting’ the environment. So what do we really know about the wastes that come from the uranium chain from its mining to its uses in nuclear power generation and weapons manufacture? Let’s begin with a reality check of northern Saskatchewan where uranium and radium have been mined since the 1930's.

Radioactive tailings from the Gunnar and Beaverlodge mines and others in that area are still drifting into Lake Athabasca and NOTHING has been done to clean them up. The Federal and Saskatchewan Governments have reached tentative agreement on what to do but their estimated combined financial cost of \$24 million falls(2) far short of the TWO BILLION dollars that Federal Minister of Environment Anderson said was necessary. (3) A study around the Key Lake mine area (4) in 1997 concluded that uranium, radium-226, lead-210 and polonium-210 , all dangerous to the biosphere, were present in plants, soil, animals in amounts well above permissible limits for humans. The highest amounts were for Polonium-210 a breakdown product of the gas radon that enters the atmosphere from uranium mines and mills and can spread around the globe. An American scientist (5) estimated that from the 150 million tonnes of rock waste

produced by uranium mining at Elliott Lake, Ontario, up to 250,000 people will die from the effects of radon gas over the next 16,000 years ! There were already at that time (1992) more than 200 uranium miners dead from lung cancer. **(6)**

Radium-226 is the main radioactive substance in uranium mine wastes and it all goes back into the huge tailings areas where it can leach into the interconnected waterways of the north where almost every uranium mine is situated either under or adjacent to a lake. Radium is extremely radioactive; for example the McArthur River mine has an average uranium content in the ore of 21%. This brings 122 bequerels of radium-226 into the environment with each **gram** of ore. Radium and thorium are both dangerous alpha-radiation emitters and they persist for immensely long periods of time (Half lives of 1600 and 75,400 years respectively).

The JEB pit at McClean Lake mine where these wastes are being stored is enormous - roughly four football fields in diameter and half a kilometre deep ! By the year 2002 Canada had accumulated 197.2 million tonnes of uranium mine waste, mostly in Ontario because of the low grade of uranium ore. But in Saskatchewan the 22 million tonnes accumulated from 38 years of mining contain orders of magnitude more radioactivity due to the exceptionally high grades (20-40%) of uranium in the ore.

Uranium mining worldwide had been associated with lung cancer deaths in miners since the 1600's - the proof is there, but the Canadian Nuclear Safety Commission that is supposed to be the watch dog for the public has concluded it is not worth studying the epidemiology of cancer in uranium miners in Saskatchewan mines "because the risks are so low now in monitored mines that we cannot show effects from radiation" ! **(7)**

What about wastes from Nuclear Reactors?

What about the other end of the uranium chain such as Nuclear Reactors and their wastes?

By 2002 approximately 1.8 million highly radioactive fuel elements had accumulated at Canadian reactors making Canada the SECOND biggest producer (after Russia) of nuclear reactor waste! AECL spent over \$700 million (of Public money) on

researching the possibility of an underground cavern depository in the Canadian Shield for this waste. When the result was presented to the Seaborn Panel that took eight years to come to a decision, it was recommended by the panel that it NOT be chosen for a variety of reasons. When the Federal Government discovered that the costs could be as high as \$20 Billion (a low estimate) and take up to seventy years to dispose of the CURRENTLY ACCUMULATED wastes it panicked. It immediately passed an act saying that the producers of the waste have to pay ! Since Ontario Hydro (the majority owner of nuclear reactors in Canada) was already in debt to the tune of \$38 billion for building the nuclear reactors there was an instant request for a further 'study' of how to dispose of high-level nuclear waste. So, the Feds created the Nuclear Waste Management Organization representing all the nuclear owners in Canada that took several years to come up with its report (8) of what to do with nuclear waste. Remember, nuclear reactors have been around for over forty years and the costs of disposing of waste and decommissioning them was never included in the retail price for "cheap electricity from nuclear reactors" touted by the proponents of nuclear reactors. The new advice is to do three things, store the waste at reactors above ground, store it at a central site and at an underground repository but don't hurry there's plenty of time and we may even find some even better methods along the way!

The enormous sums of global capital diverted to the so-called 'peaceful use of atomic energy' originated in every country that originally produced nuclear weapons with public money, i.e., USA, Britain, France, Russia. The technology spread to other countries with Canada playing a key role in supplying the first uranium for an atomic bomb and much of the weaponry for the USA, France and Britain. The trade in uranium still goes on with Canada having played a major role in a cartel to fix the price of uranium and the design of the CANDU reactor that produced plutonium, the ingredient of the really BIG atomic bombs. AECL has received billions of dollars of public money granted by the Federal Govt through Cabinet grants **that have never been subject to debate in Parliament** . But wait, what about the decommissioning of the fast-wearing-out reactors and their highly radioactive building and non-fuel wastes? Well, the Chalk River experimental (small) reactor wastes produced from AECL research (150,000 cubic metres of stuff!) are estimated to cost \$530 million if they can get permission to put them

in a cave near the Ottawa River (9). Guess what a BIG reactor might cost? Well the Hanford reactor (10) just south of the Canadian border in Washington State has 2000 metric tonnes of HIGHLY radioactive material and 61 MILLION tonnes of liquid wastes spread over 1,100 sites in an area of 560 square miles . The estimates range up to \$140 billion dollars to clean up the mess! Tiny little Britain already has 2.3 million cubic metres of nuclear waste stored around the country and it is only now facing the decommissioning of its first reactor. They are faced with costs up to \$200 billion. Given the 450 or so reactors globally just imagine the bill for cleanup and who will pay for it. Usually Jo Smith the public!

But these pale beside Russia's bigger problems (11). They have 610 million cubic metres of radioactive waste, which makes the 1.7 million tonnes of uranium-mine wastes in our Great Bear Lake seem insignificant. But of course none of these wastes are insignificant in terms of the viability of the global biosphere. Britain, Japan, France and particularly Russia have also dumped radioactive wastes into the oceans so that the entire biosphere is being loaded with extremely persistent radioactive contaminants, many with half lives in the tens and hundreds of thousands of years!

The crime of the nuclear proponents is the cover-up of two things. Firstly, the enormous capital diversions that will be necessary just to clean up accumulated wastes from the full uranium chain but also the costs of decommissioning mines and reactors. Secondly, the long-term dangers to the biosphere from the release of ionizing radioactive substances that will pose a threat for generations to come just so that the current generation can light their homes and run industry to produce more and more consumer goods. The devil is in the detail and most people don't want to hear the detail because advocates such as the Canadian Nuclear Association, AECL, CAMECO and AREVA spend millions of dollars on false claims that "nuclear is clean" and "nuclear is the only option against global warming" Propaganda and brain-washing lull the public into sleep!

It is time, folks, to shut down the complete uranium chain, from mining through nuclear power generation to weapons manufacture!

Some sources of information:

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- (2) Saskatchewan Environmental Society. 2006. March/April Issue, Newsletter. p.6.
- (3) CBC Documentary, Uranium Mining in Saskatchewan, David Common.
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139 pp. plus appendix. For Environment Canada.
- (5) Goldman, B. January 1992. as quoted by Parker, J. Star-Phoenix . Anti-nuke speaker sparks raucous debate.
- (6) Updated analysis of the Eldorado Uranium Miners Cohort : Part 1 of the Uranium Miners Cohort Study. Dr. Geoffrey R. Howe, March 16, 2006
- (7) News Release: CNSC, June 18th, 2004.
- (8) Nuclear Waste Management Organization. 'Choosing a way forward. The future management of Canada's used nuclear fuel. Final Study. 450 pp. Nov. 2005.
- (9) Bueckert, D. Nuclear cleanup plan would store waste in caves near Ottawa River. Globe and Mail. June 3, 2006.
- (10) Simons, P. Legacy that's too hot to handle. Manchester Guardian Weekly. Jan. 29, 1989.
- (11) Blackhurst, C, Cavenagh, A. Russia fears atom plant catastrophe. Documents highlight threat to the West. The Observer, London, England. Nov.6.1994.