

A RESPONSE TO THE UDP REPORT - HIGH LEVEL NUCLEAR WASTE

It all began with the Manhattan Project in 1945. Scientists learned how to trigger nuclear fission, and make nuclear bombs. The USA Air Force dropped a nuclear bomb on Hiroshima and Nagasaki in August of 1945, and massacred 220,500 people.

Then the new slogan became, "Atoms for Peace," with the byword of "Electricity--too cheap to meter." But it never happened. There was a rush in the 1970's and 1980's to build nuclear reactors---20 in Canada, 104 in the USA, 430 worldwide. The costs were enormous. Canada developed a debt of \$78 billion, with \$28 billion in "stranded debt", for which Ontario households still pay an extra fee on each monthly electric bill. Without debate in Parliament, the Federal Government has granted a series of subsidies now totaling \$18 billion dollars. These reactors have never proven economical or self-sustaining, always needing federal subsidies to survive. The myth of cheap electricity was illusory.

Moreover, nuclear fission produces terribly dangerous by-products—some 211 in number. From fission, and the changing configuration of atoms and molecules, these wastes emerge, some of them chemicals not even found in the natural world—all of them deadly dangerous either chemically or from radioactivity. A handful of such waste held at arms length, will kill a person in one minute. Such wastes must be handled robotically and cooled for seven years in pools of water, then stored in steel casks for many years, remaining deadly dangerous for thousands of years.

The USA has built up a stockpile of 70,000 metric tonnes of used fuel rods, enough to cover a football field over 21 feet deep. Canada has stored 38,408 tonnes of nuclear waste. After 65 years, scientists still do not know what to do with it, and have not developed a satisfactory disposal system

The USA has spent \$13.6 billion dollars over 20 years to develop a special shaft to house waste in Yucca Mountain, Nevada. Because of geological faults, earthquakes, water migration in rocks, and protests from Nevada, it has proved to be unsatisfactory. President Obama has now suspended the massive funding, so for the present the USA is back to square one, and beginning research once more.

Canadian scientists have been working on the vexing problem of nuclear waste for decades. Some six major research studies have been done, but still no satisfactory solution. (See Appendix)

Over a period of 15 years, Atomic Energy of Canada, Ltd. (AECL) carried out a massive research and developed an elaborate plan for deep rock burial of nuclear waste. Costing \$700 million dollars, it published "The Environmental Impact Statement on the Geologic Disposal Concept." Part of this research involved the Whiteshell Research Laboratory and experimental deep rock shaft at Pinawa, Manitoba. After 15 years the shaft was shut down and the project cancelled because it was constantly flooding with underground water.

In 1957, the geologists, P. Fritz and S.K. Frappe published a significant book entitled, *Saline Waters and Crystalline Rocks*. It revealed that under the Pre-Cambrian rock in Canada, and other parts of the world, there is a large layer of salt water under extreme pressure. The continuous flooding of deep rock gold mines across Canada reveals this phenomena. Deep rock burial is not as dry and safe as it sounds! In spite of this geological knowledge, the nuclear industry keeps repeating the deep rock burial scheme as a solution. It ignores this geological study and hopes that it will go away!

In 1994, AECL produced its detailed plan and blueprint for deep rock disposal. For several years a Scientific Review Committee studied the plan and issued a Report indicating that some 90 problems still needed to be addressed.

Then the Seaborn Commission studied the AECL plan. It interviewed specialists, held consultations across Canada for eight years, spending \$7 million dollars. The Commission found the Plan unacceptable.

The Federal Government contravened the Seaborn recommendation to establish an arms-length, independent, multi-specialized organization to address this issue. Instead, the government turned the whole problem over to the mine owners and vested interests to form a Nuclear Waste Management Organization (NWMO). It added the quickie principle of "the polluter pays" in order to get the predicament off the government's back.

Since then, the NWMO has been carrying out studies, printing booklets, taking surveys, and now initiating a "process for citing" in a deep rock depository. It has made no new discoveries or breakthroughs about how to solve this vexing problem. It has added a fancy new phrase to the mix called "Adaptive Phased Management." This is still the original plan, but now broken down into three different stages stretching over long periods of time. It continues the "same old, same old" refrain—"Let's do deep

rock burial." The concept remains unproven because science can not accurately prove long term predictions.

The NWMO has declared Saskatchewan a potential dumping site for nuclear fuel waste that comes mainly from Ontario, on the grounds that uranium is mined in Saskatchewan. Strange logic!

Radioactive substances disintegrate into sub-particles so their potency is measured by how many years it takes for half of the original amount to disappear; called a 'half-life.' For these wastes the half-life of radium-226 is 1600 years; plutonium-239 is 24,400 years; thorium-230 is 77,000 years; cesium-135 is 2,300,000 years; iodine-129 some 15,700,000 years; uranium-238 some 4000 million years. After another half-life time span a quarter of the original amount will still be radioactive. In reality, many of these substances will remain deadly for longer than geological history!

In the face of these horrendous facts, the Report of the Uranium Development Partnership (2009) says very little. It makes bland reference to the safety of workers and members of the public (pp. 4(h), 13(A), 37(h)). Later it mentions the dangers of long lived isotopes and fission products (p.70)

Finally, it does admit to the danger: "Given its radioactivity, used fuel and other high-level wastes remain hazardous to humans and the environment and need to be safely and securely contained and isolated for periods of up to hundreds of thousands of years." (p. 74)

The writers of this Report take no responsibility for the legacy for Saskatchewan and Canada which will be inevitably left to future generations. They assume the NWMO will take care of it with deep rock burial! No mention of underlying pressurized brine. No mention of the cracks and fissures in rock following drilling and blasting. No mention of microbes and water migration in rock. No evidence that the system will really work!

In his book *Small Is Beautiful*, written some 36 years ago, E. F. Schumacher struggled with the problem of nuclear wastes and wrote: " No degree of prosperity could justify the accumulation of large amounts of toxic substance which nobody knows how to make it 'safe' and which remain an incalculable danger to the whole of creation for historical or even geological ages. To do such a thing is a transgression against life itself, a transgression infinitely more serious than any crime perpetrated by man. The idea that a civilization could sustain itself on the basis of such a transgression is an ethical, spiritual and

- 1987 The Brundtland Report - by Gro Harlem Brundtland, Chairperson, "United Nations World Commission on Environmental Development: Our Common Future," (Oxford University Press, 1987)
- 1998 Seaborn Panel Report, by the Seaborn Environmental Assessment Panel.
- found that geologic disposal should be studied further.
 - should not now be accepted as Canada's policy
 - not publicly acceptable, and safety concept is not established.