

To Dr. Gordon Edwards

Please answer these questions BELOW with relevant research. Thanks.

1. Please share any expertise you might have in terms of safe disposal options for nuclear reactors — specifically, one located near Whiteshell on the Winnipeg River. They [Canadian nuclear authorities] said they would like to encase it in concrete, which apparently gives 300 years of safe storage.
2. Are there any other known physical options for safe disposal of nuclear waste? The concrete method just seems so simplistic. Is this just an easy way out, or if science actually has something better than this?

Any assistance or insight would be appreciated.

=====

Dr. Edwards' reply:

Thank you for your email regarding radioactive waste issues at the closed-down Whiteshell Nuclear Research Establishment near Pinawa, Manitoba, on the Winnipeg River. That site is currently undergoing extensive decommissioning activities involving a wide variety of radioactive waste materials.

See www.cnl.ca/en/home/environmental-stewardship/whiteshell/default.aspx

Questions regarding radioactive waste in Manitoba

In particular, the questions you have sent me from a First Nations source seem to be focussed on industry plans for the “in-situ decommissioning” of an old shut-down nuclear research reactor (called the WR-1 reactor) located at that federally-owned site, near the edge of Whiteshell Provincial Park.

By the “Atomic Energy Board” I presume the questioner is referring to the Canadian Nuclear Safety Commission (CNSC), which is Canada’s current nuclear regulatory agency. (The predecessor of the CNSC was the Atomic Energy Control Board, or AECB.)

See www.nuclearsafety.gc.ca/eng/resources/environmental-assessments/ongoing/manitoba/decommissioning-whiteshell-reactor-1.cfm

I have written two submissions on this topic for the Canadian Coalition for Nuclear Responsibility (CCNR). They were submitted to the CNSC in 2017 and 2018. These submissions are highly critical of current industry plans to “entomb” the WR-1 reactor entrails in concrete, and leave that concrete radioactive mausoleum near the shore of the Winnipeg River as a permanent radioactive waste dump – despite the fact that this site was never chosen to serve such a purpose, and despite the long-held view in the nuclear field that radioactive waste should never be left (abandoned) near circulating water.

See www.ccnr.org/CCNR_WR1_2017.pdf and www.ccnr.org/CCNR_WR1_Supp_2018.pdf.

The proponent of the concrete entombment of the Whiteshell reactor is Canadian Nuclear Laboratories (CNL), owned and run by a private consortium of multinational for-profit corporations. In their licence application to the CNSC they say that the concrete will safely contain the radioactivity for 300 years, despite the fact that most concrete structures have an expected lifetime of 50 years or less. In its own report, CNL gives a partial list (Table 7.2.1-1) of some of the many human-made radioactive materials that are in question. They do not mention the half-lives of these materials. The half-life of a radioactive substance is the time it takes for half of the material to disintegrate.

Of the 22 radionuclides indicated in Table 7.2.1-1, eleven of them have half-lives of over 100 years, nine of them have half-lives over 1,500 years, seven of them half half-lives over 15,000 years, four of them half half-lives over 100,000 years, and one of them has a half-life over 15 million years. In my own report for CCNR, I separated the half-lives into two columns — less than 100 years, and more than 100 years.

Here are the half-lives of the radionuclides mentioned in Table 7.2.1-1 :

Radionuclide	Half-Life
Hydrogen-3 (Tritium),	12.3 years
Carbon-14,	5 730 years
Chlorine-36,	301 000 years
Calcium-41,	102 000 years
Iron-55,	2.73 years
Nickel-59,	76 000 years
Nickel-63,	101 years
Cobalt-60,	5.26 years
Strontium-90,	28.8 years
Niobium-94	20 300 years
Zirconium-95,	64.0 days
Technetium-99,	120 000 years
Antimony-125,	2.76 years
Iodine-129,	15 700 000 years
Cesium-137,	30.2 years
Europium-152,	13.5 years
“Radon-226” (Radium-226),	1 600 years
Plutonium-239,	24 100 years
Plutonium-240,	6 560 years
Plutonium-241,	14.4 years
Americium-241,	432 years
Curium-244,	18.1 years

Anishinabek Nation and Iroquois Caucus Working Group

In Ontario, the heartland of Canada's nuclear industry, the Anishinabek Nations' Union of Ontario Indians (comprising 40 First Nations located throughout Ontario) joined forces in 2017 with the Iroquois Caucus to form a Radioactive Waste Working Group, which meets from time to time to assess radioactive waste matters in the province from a First Nations perspective and to coordinate activities. Chiefs involved in this Group issued a Joint Declaration on the transport and abandonment of radioactive wastes that encompasses five important principles for the responsible long-term management of radioactive waste of all kinds. The Assembly of First Nations passed a resolution along the same lines later that same year in Winnipeg.

See www.ccnr.org/Joint_Declaration_2017.pdf and www.ccnr.org/AFN_Resolution_2017.pdf

The 5 principles from the Joint Declaration of the Anishinabek Nation & Iroquois Caucus are:

- 1. **No Abandonment:** Radioactive waste materials are damaging to living things. Many of these materials remain dangerous for tens of thousands of years or even longer. They must be kept out of the food we eat, the water we drink, the air we breathe, and the land we live on for many generations to come. The forces of Mother Earth are powerful and unpredictable and no human-made structures can be counted on to resist those forces forever. Such dangerous materials cannot be abandoned and forgotten.*
- 2. **Monitored and Retrievable Storage:** Continuous guardianship of nuclear waste material is needed. This means long-term monitoring and retrievable storage. Information and resources must be passed on from one generation to the next so that our grandchildren's grandchildren will be able to detect any signs of leakage of radioactive waste materials and protect themselves. They need to know how to fix such leaks as soon as they happen.*
- 3. **Better Containment, More Packaging:** Cost and profit must never be the basis for long-term radioactive waste management. Paying a higher price for better containment today will help prevent much greater costs in the future when containment fails. Such failure will include irreparable environmental damage and radiation-induced diseases. The right kinds of packaging should be designed to make it easier to monitor, retrieve, and repackage insecure portions of the waste inventory as needed, for centuries to come.*
- 4. **Away from Major Water Bodies:** Rivers and lakes are the blood and the lungs of Mother Earth. When we contaminate our waterways, we are poisoning life itself. That is why radioactive waste must not be stored beside major water bodies for the long-term. Yet this is exactly what is being planned at five locations in Canada: Kincardine on Lake Huron, Port Hope near Lake Ontario, Pinawa beside the Winnipeg River, and Chalk River and Rolphton beside the Ottawa River.*
- 5. **No Imports or Exports:** The import and export of nuclear wastes over public roads and bridges should be forbidden except in truly exceptional cases after full consultation with all whose lands and waters are being put at risk. In particular, the planned shipment of highly radioactive liquid from Chalk River to South Carolina should not be allowed because it can be down-blended and solidified on site at Chalk River. Transport of nuclear waste should be strictly limited and decided on a case-by-case basis with full consultation with all those affected.*

See www.ccnr.org/TRM_Transport_Niagara.pdf

Last year a delegation of 5 chiefs from the affected First Nations in Ontario, accompanied by three others, went to the United Nations in New York City to communicate their positions on the subject of radioactive wastes. A video of this event, held on the occasion of the 17th Session of the UN Permanent Forum on indigenous issues, is posted on the web site of the United Nations and will be there for at least 3 years.

See <http://webtv.un.org/watch/radioactive-waste-and-canadas-first-nations-unpfi-side-event/5775372426001/>

Nature of the radioactive waste problem and alternative approaches

Ever since the dawn of the nuclear age in Canada, the federal government and the Canadian nuclear industry have promised that all dangerous radioactive byproducts created by the industry would be safely stored and kept out of the environment for countless thousands of years – a period of time that dwarfs the span of recorded human history.

Many people, scientists and non-scientists alike, regard the long term management of radioactive waste as one of the major unsolved problems of the human race. Many ideas have been proposed, but all have proven to have serious pitfalls or drawbacks. Dumping in the oceans, now forbidden by international law. Burial in the antarctic ice fields, likewise forbidden. Shooting it into outer space, regarded as far too dangerous due to rocket failures and explosions.

See *LONG TERM MANAGEMENT METHODS RECEIVING INTERNATIONAL ATTENTION (NWMO)*
www.ccnr.org/GE_NWMO_ITK_Questions.pdf

High-Level Radioactive Waste – Geological Disposal

For example, the long-term management of irradiated nuclear fuel, called “high-level nuclear waste”, is still an open question as there is as yet no licensed and operating repository to store such waste anywhere in the world. The nuclear industry has long advocating burying this waste in a “deep geological repository”, and eventually abandoning it there. But there have been eight attempts in the USA to situate such a repository, and all eight attempts have failed.

In 1978, the Ontario Royal Commission on Electric Power Planning published a report (*A Race Against Time*) that recommended a ban on new nuclear reactors unless such a high-level waste repository solution is found by 1985. That same year, Quebec banned any new reactors in the province. At the same time, the governments of Canada and Ontario launched a \$700 million research project that lasted 15 years to demonstrate the concept of deep geological disposal of high-level waste. The Underground Research Laboratory was built near Lac du Bonnet in Manitoba (not far from Pinawa) to “validate” the concept of geological disposal, but no radioactive materials were allowed to be emplaced in that experimental repository, and Manitoba

subsequently passed a law forbidding the import of high-level radioactive wastes into the province for the purpose of permanent disposal.

See <https://web2.gov.mb.ca/laws/statutes/ccsm/r010e.php>

Following a ten-year environmental assessment process with public hearings in five provinces conducted by an independent panel, the government of Canada told the waste-producing utilities in Ontario, Quebec and New Brunswick, to establish an industry-owned agency, the Nuclear Waste Management Agency (NWMO), to find a “willing host community” somewhere in Canada that would be prepared to accept all of Canada’s high-level nuclear waste for eventual deep geological disposal.

That search is still ongoing, with only five out of the eleven original candidate communities still in the running. Each of the remaining five communities, all in Ontario, typically with a population less than 1000, receive \$300,000 per year just for participating. The estimated cost of the ultimate disposal of irradiated nuclear fuel underground in Canada is estimated to be about \$26 billion dollars. Many believe the true cost is likely to be double or triple that amount, and some (including myself) are skeptical that the plan will succeed, given the failures that have already occurred elsewhere.

Low-Level and Intermediate-Level Radioactive Wastes

Even after the intensely radioactive high-level waste (the irradiated nuclear fuel) has been removed from the reactor, the entire core area of the facility (where the fuel was housed) and the primary cooling system (the pipes, pumps, condensers, and other equipment used to circulate the coolant through the core to prevent the fuel from overheating and “melting down” at a very high temperature) has also become radioactive waste.

Moreover there are gloves, mops, filters, fueling machines, cranes and other materials which have become so radioactively contaminated that they too must be stored as radioactive waste and must not be recycled for commercial use for fear of introducing radioactive wastes into the marketplace. All such wastes are called “low-level and intermediate-level wastes” in order to distinguish them from the much more intensely radioactive irradiated fuel.

In Ontario there are 22 electricity-producing nuclear reactors (18 of which are still operating). Ontario Power Generation is hoping to get approval from the government of Canada to put all of the low-level and intermediate-level radioactive waste from all of its 22 reactors into a deep underground storage facility less than a mile from Lake Huron. Inspired by the idea of a geologic repository for high-level waste, this underground repository (700 metres deep) is intended to host a bewildering variety of

radioactive wastes in many different kinds of physical and chemical forms. When filled the repository would be sealed and abandoned, following a lengthy period of consolidation and monitoring.

This proposal has elicited a storm of protest and the final decision has been delayed for years. Over 100 Great Lakes Mayors and top elected officials have joined forces in calling on the Canadian government to reject OPG's proposed nuclear waste repository. The Saugeen Ojibway First Nation has not yet given its approval and OPG has promised that it will not proceed against the wishes of that First Nation. Environment Minister Catherine McKenna has withheld any federal government decision, pro or con, for the OPG project, until the Saugeen FN declares itself on this matter.

See <http://stopthegreatlakesnucleardump.com>

Much of the motivation for such protests has to do with dramatic failures of underground repositories for low-level and intermediate-level wastes in the USA and Germany that have occurred in recent years. The German government has formally admitted that the emplacement of similar radioactive wastes in the deep underground Asse-2 facility, an abandoned salt mine, has been an unmitigated disaster. They have now ordered the radioactive waste to be removed from the facility and brought back to the surface, an onerous task that is expected to take at least 30 years and cost at least two billion dollars. It has emerged that radioactive materials were leaking from the Asse-2 facility for over ten years before the industry alerted officials to the problem, presumably because to admit the waste was leaking would be bad public relations and would constitute a major embarrassment to Germany's nuclear industry.

Another deep underground repository for low- and intermediate-level wastes at Morsleben, in Germany, also appears to be failing, as the entire repository seems to be sagging and collapsing. So far the government has not decided what to do in the case of Morsleben, but Germany admits it seems to be another case of very questionable practices when it comes to the long-term confinement of radioactive waste.

The only deep geological repository for radioactive wastes in North America is located near Carlsbad New Mexico. It is called the Waste Isolation Pilot Project (WIPP). In 2013, scientists and engineers from OPG, NWMO, and CNSC, all praised the WIPP facility in sworn testimony as an example of state-of-the-art safe storage of low and intermediate level radioactive waste in a deep underground repository. Then, in February 2014, one sealed drum of radioactive waste stored in a deep underground chamber at WIPP exploded and turned into a flame-thrower, spreading plutonium-bearing radioactive dust throughout the underground shafts and chambers. The dust rose 700 metres vertically upwards to the surface where it contaminated 22 workers, then drifted downwind to lightly contaminate the town of Carlsbad. The facility had to

be closed for over two years and required over a billion dollars of decontamination efforts before it could be "opened for business" again.

Decommissioning of Nuclear Reactors

There is at present no federal government policy on the decommissioning of defunct nuclear reactors, nor is there any proposed repository or other facility to receive the large volumes of radioactive rubble from such decommissioning activities. The proposed deep geological repository for high-level radioactive wastes currently planned by NWMO specifically excludes decommissioning wastes, as well as all other low and intermediate level wastes. The OPG deep underground facility for low and intermediate level wastes at Kincardine on the shore of Lake Huron also excludes decommissioning wastes, as well as any radioactive wastes from other provinces.

So what is one to do with the decommissioning wastes?

When it comes to the long-term management of radioactive structural materials and radioactively contaminated equipment left over from old, shut-down nuclear reactors, Atomic Energy of Canada Limited (AECL) has always in the past advocated the dismantling of such facilities, with all radioactive materials carefully packaged and labelled and eventually shipped off-site to be placed in some specially designed radioactive waste storage facility. The reactor site itself would be completely decontaminated and returned to "green field" status, meaning that it would be able to be safely and freely used for any other purpose whatsoever. Conceptually, the site would be returned to pristine condition, as if the nuclear reactor had never been there.

See for example AECL-6332, "Decommissioning of CANDU Nuclear Power Stations", by G. N. Unsworth, <https://www.ipen.br/biblioteca/rel/R42114.pdf>

The Age of Nuclear Power is Winding Down, but the Age of Nuclear Waste is Just Beginning

But in recent years, things have changed. Due to dwindling prospects for sales of new nuclear power reactors, the Stephen Harper government sold the CANDU nuclear reactor division of AECL to the highly controversial and scandal-ridden company SNC-Lavalin in 2011 for a mere \$15 million. SNC has subsequently been awarded billions of dollars in contracts to refurbish old CANDU reactors in Ontario and overseas, without having been saddled with any of the voluminous and costly radioactive waste liabilities that remain the property and the sole responsibility of AECL and the Canadian taxpayer. The Auditor General of Canada has estimated the federal government's radioactive waste and decommissioning liabilities at \$7.9 billion.

The Harper government subsequently – in 2015, just prior to the election of Justin Trudeau’s government – put SNC-Lavalin and four other profit-oriented multinational corporations based in other countries (the USA and the UK) in charge of all federally-owned radioactive waste, nuclear reactors, and nuclear research facilities (i.e. Chalk River in Ontario and Whiteshell in Manitoba), with a mandate to “reduce” the federal radioactive waste liabilities as quickly and cheaply as possible. That consortium of multinationals, operating under the name “Canadian Nuclear Laboratories (CNL), has been receiving close to a billion dollars a year from the federal taxpayer, all of it funneled through the coffers of the crown corporation AECL, whose staff has been slashed from about 3600 to only 40 individuals. The original consortium members were SNC-Lavalin, CH2M, Fluor, W.S. Atkins, and Rolls-Royce.

See cnea.co/members.html

Two years earlier, in 2013, SNC had been barred for 10 years from bidding on any projects financed by the World Bank because of well-documented fraudulent and unethical conduct overseas. This criminal behaviour by SNC-Lavalin was known to the government at the time. Recently, the Honourable Jody Wilson-Raybould, Canada’s first indigenous person to be appointed as Canada’s Attorney General, and the first woman to hold that post, resigned from cabinet in a swirl of controversy surrounding criminal charges that have been laid against SNC-Lavalin for alleged corrupt activities in Libya. Criminal charges are also pending for SNC-Lavalin, involving tens of millions of dollars in bribes related to the building of the McGill Superhospital in Montreal.

The consortium that owns and operates CNL is now made up of four multinationals, as SNC-Lavalin in 2017 acquired (purchased) one of the other players – W.S. Atkins based in the UK. It turns out that SNC-Lavalin is not the only scandal-ridden company involved in the consortium. In fact, all four consortium partners have been found guilty of unethical and/or criminal activities in the field of radioactive waste management in other countries.

The current “quick and dirty” plan by the consortium to “entomb” the Whiteshell reactor in concrete and abandon the radioactive remains beside the Winnipeg River is completely at odds with all previous promises from AECL. A letter signed by several retired AECL scientists and engineers from the Whiteshell Nuclear Research Establishment expressed great concern over this in-situ abandonment scheme as upsetting and scientifically unjustified.

See www.ccnr.org/Letter_Retired_Engineers_&_Scientists_2017.pdf

It is also worth noting that the International Atomic Energy Agency (IAEA), with headquarters in Vienna, has clearly declared that the entombment of a defunct reactor

is NOT an acceptable strategy except in extreme circumstances. The following paragraphed is copied from the IAEA in-line glossary of nuclear industry terms:

"Entombment. The encasing of part or all of a facility in a structure of long lived material for the purposes of decommissioning. Entombment is not considered an acceptable strategy for decommissioning a facility following planned permanent shutdown. Entombment may be considered acceptable only under exceptional circumstances (e.g. following a severe accident). In this case, the entombment structure is maintained and surveillance is continued until the radioactive inventory decays to a level permitting termination of the licence and unrestricted release of the structure."

The IAEA position stated above is completely in accord with all previous Canadian thinking on decommissioning of nuclear reactors. For example, on page 4 of a glossy 7-page OPG insert that was published in the National Post, under a banner headline entitled "Decommissioning in Canada's Near Future", we read:

". . . entombment is only used under exceptional circumstances, usually when there has been a severe accident. It involves building a concrete structure to encase the plant, preventing the possibility of any radioactive leaks. The Entombment strategy removes the need of ever having to transport the radioactive materials away from the plant, but the site can never be regenerated."

See https://www.opg.com/generating-power/nuclear/nuclear-waste-management/documents/Nuclear_Renaissance_brochure.pdf

Health Dangers of Radioactivity

Radioactive materials are made of unstable atoms. These unstable atoms continually disintegrate, or explode, giving off dangerous subatomic projectiles in the form of "atomic radiation". Such invisible emissions are totally undetectable by our five senses, and they are harmful to living things. Since radioactivity cannot be shut off, these waste materials must be kept out of the environment of living things for as long as they pose a hazard. As it turns out, that corresponds to many thousands of years.

Cancer, leukemia, and damage to reproductive cells (eggs and sperm) are among the harmful biological effects that may be caused by chronic exposure to radioactive materials, whether externally (from contaminated soil or buildings) or internally (by eating contaminated food, drinking contaminated water, or breathing contaminated air).

Chronic exposure to atomic radiation will also compromise the immune system by adversely affecting the most radio-sensitive blood cells, thereby making the individual

more vulnerable to infectious diseases of all kinds. In addition there is evidence of increased cardiovascular disease (heart attacks and strokes) associated with chronic exposure to radioactivity.

Here is a link to background document on the subject of health effects caused by radioactive exposure that I wrote for the Pikwakanagan Algonquin First Nation whose traditional unceded territory includes the AECL/CNL Chalk River site on the Ottawa River in Ontario, just about 250 km upstream from the nation's capital.

See http://ccnr.org/Pikwakanagan_3.pdf

Rolling Stewardship

At present, there is no solution to the problem of sequestering long-lived radioactive waste in a permanently satisfactory way — one that would allow for the safe walk-away abandonment of the dangerous material. Such is the case for all long-lived human-made radioactive waste, whether it is high-level waste (irradiated nuclear fuel), low-level and intermediate-level waste (from nuclear reactor operations), or decommissioning waste (from defunct nuclear reactors).

Therefore, placing such wastes beyond human control will leave future generations powerless to deal with the consequences of eventual leakage and radioactive contamination of food, water, soil and air. While nuclear proponents want to limit their own financial liability by claiming that the problem has been addressed once and for all, the long-term protection of the health and safety of people and the environment is a never-ending concern and must take priority.

Accordingly, the Canadian Coalition for Nuclear Responsibility (CCNR) advocates an entirely different approach called Rolling Stewardship – an intergenerational waste management concept whereby each successive generation passes on the relevant knowledge and provides the necessary tools and resources to the next generation, so that these human-made radioactive wastes are never placed beyond human control and are never left completely unattended.

See www.ccnr.org/Rolling_Stewardship.pdf and www.ccnr.org/CCNR_Undertaking_final.pdf

We have no way to eliminate radioactive waste materials altogether, or to render them harmless, but we do know how to package them in leak-proof containers that will prevent them from getting out into the environment of living things for decades, perhaps even for centuries. But not forever.

Therefore ongoing routine monitoring is needed, to alert society to any failures of containment. For this reason, our descendants need to be fully informed about the nature of the radioactive waste and empowered to improve upon our own clumsy

attempts to deal it. They need to be able to monitor the waste and retrieve it when necessary. If leakage occurs, they need to be able to detect the problem and take corrective action in a timely manner – perhaps by repairing the original containers or by repackaging the waste in new, greatly improved containers. For this to be a possibility, the waste must be segregated into categories, carefully documented, and stored neatly in a recoverable form.

Rolling Stewardship is not intended as a mere caretaker operation, but as an active, fully involved societal effort to continually improve security by retrieving, recharacterizing and repackaging the waste in ever more protective ways, until such time as a genuine solution to the radioactive waste dilemma is found – perhaps in the guise of a new hitherto non-existent technology that can destroy the waste, or render it harmless, or remove it permanently from the Earth.

The Official Plan for WR-1 – An Alternative to Entombment

Entombment is a radical departure from past practice. The consortium seeks permission to dump the radioactive components of WR-1 into the sub-basement, then flood the subterranean workings with a liquid mixture of sand and cement, ultimately abandoning the congealed mass as a permanent radioactive waste dump right beside the Winnipeg River.

CCNR maintains that incorporating the radioactive remains of the WR-1 reactor in an enormous subterranean concrete blob that will eventually crumble and allow migration of radionuclides into the groundwater and the Winnipeg River is unacceptable. If and when things go badly wrong, how are future generations expected to redress the situation?

Not only is entombment completely at odds with OPG and IAEA warnings that such an approach is not acceptable, but it also flatly contradicts the current AECL decommissioning plan that was fully reviewed, approved, and licensed in 2002. The approved AECL plan calls for a return of the WR-1 property to green field status. The radioactive structure is to be carefully dismantled, and all radioactive waste materials are to be neatly packaged and labelled in robust leak-proof containers, to be eventually removed from the Whiteshell site and emplaced in a suitable off-site radioactive waste repository designed to safely store those materials indefinitely (i.e. for eternity).

In its 2017 Environmental Impact Statement (EIS), the consortium – operating under the name Canadian Nuclear Laboratories (CNL) – argues that since there is as yet no designated radioactive waste repository to receive decommissioning waste, the official 2002 plan has to be scrapped. This is not necessarily so. The radioactive remains of

the WR-1 reactor can be packaged as prescribed and stored on site until such a repository is ready, which may not be in the foreseeable future, if ever. It is an ideal situation for employing the principle of Rolling Stewardship. Manitoba citizens, including First Nations people with no links to the nuclear industry, could be employed, educated, and trained in the necessary techniques to monitor the waste and safeguard it in an ongoing intergenerational way.

By contrast, the SNC-Lavalin (et al.) entombment plan has not yet been reviewed, approved or licensed. It is evidently designed more for the convenience of the consortium than for the security of future generations. Nevertheless, the CNSC approvals process has already begun, based on the 2017 EIS. On what basis and with what rationale will the already approved AECL plan be set aside? Clearly, the CNL proposal would make Rolling Stewardship virtually impossible.

The Canadian Nuclear Safety Commission (CNSC)

The CNSC is widely regarded as a captured regulator, playing a supportive role to the nuclear industry. As stated in the Final Report of the government-appointed Expert Panel on Impact Assessment (section 3.1.1):

"A frequently cited concern was the perceived lack of independence and neutrality because of the close relationship the and have with the industries they regulate. There were concerns that these Responsible Authorities promote the projects they are tasked with regulating. The apprehension of bias or conflict of interest, whether real or not, was the single most often cited concern by participants with regard to the and as Responsible Authorities. The term "regulatory capture" was often used when participants described their perceptions of these two entities."

www.canada.ca/en/services/environment/conservation/assessments/environmental-reviews/environmental-assessment-processes/building-common-ground.html

It is a sobering fact that, in the entire 19-year history of the agency, CNSC Commissioners have never once refused to grant a licence when requested to do so by one of its licensees.

See www.ccnr.org/CNSC_licence_refusals_2017.pdf.

In 2008, when CNSC Chairwoman Linda Keen tried to enforce a safety-related regulatory requirement related to the NRU nuclear reactor at Chalk River, she was fired by the Harper government. The episode was tinged with inappropriate pressures, similar to those recently applied to Jody Wilson-Raybould when she was Attorney-General of Canada, leading to her resignation from cabinet. SNC-Lavalin reportedly

played a role in inciting the government of the day to fire Linda Keen as head of the CNSC, a so-called “independent agency”.

See www.cbc.ca/news/canada/nuclear-safety-watchdog-head-fired-for-lack-of-leadership-minister-1.748815

The CNSC reports to the Minister of Natural Resources (NRCan), a federal cabinet member whose job it is to support and promote the expansion of the nuclear industry. Witness for example the NRCan Road Map for deploying Small Modular Reactors in Canada, released in November 2018. The Road Map details federal government plans to subsidize the private development of an entire new fleet of nuclear reactors that could be deployed to accelerate resource depletion in the North and also to be sited in remote small communities including indigenous communities. The Whiteshell and Chalk River properties would be made available to private industry as “testing grounds” for these Small Modular Nuclear Reactors (SMNRs). The Ontario First Nations Chiefs in Assembly passed a resolution opposing the initiative. Is the CNSC going to go against the avowed policy of the Minister to which it reports by not licensing these SMNRs?

See www.ccnr.org/COO_resolution_SMRs_2018.pdf and www.ccnr.org/Ottawa_SMR_plans_2018.pdf.

Lack of a Federal Government Policy on Decommissioning Waste

There is no federal government policy regarding decommissioning waste or indeed any radioactive waste produced by nuclear reactors, except in the case of irradiated nuclear fuel (which is covered in the Nuclear Fuel Waste Act). The “Radioactive Waste Policy Framework” on the NRCan web site consist of exactly 143 words, equivalent to four tweets, and is entirely vacant on the subject of decommissioning.

See www.nrcan.gc.ca/energy/uranium-nuclear/7725

CCNR has written to Prime Minister Justin Trudeau asking him to initiate a wide-ranging public consultation process with First Nations and other Canadian citizens in order to develop a policy on the long-term management of radioactive wastes that we can all be proud of.

At that time CCNR, given the existing policy vacuum on radioactive waste, asked the government to halt the ongoing environmental assessment for three projects, all of them conceived by the CNL consortium : entombing the WR-1 reactor on the Winnipeg River, entombing the NPD reactor on the Ottawa River, and creating an enormous five-to-seven-storey high “megadump” at Chalk River, right on the surface, covering 70 hectares of land surface, less than one kilometre from the Ottawa River.

The proposed Chalk River megadump would hold up to one million cubic metres of mixed radioactive waste from Chalk River, Whiteshell, and other sites. It has recently

come to light that CNL is planning over 2000 shipments of radioactive waste from Whiteshell to Chalk River – shipments that would be passing through Northern Ontario close to the Great Lakes (especially Lake Superior and Lake Huron) and through the traditional territories of many First Nations communities.

CNL admits that the contents of the proposed Chalk River megadump will remain radioactive for over 100,000 years. The waters of the Ottawa River flow downstream from Chalk River, through the capital city of Canada and then on down to Montreal, where it joins the mighty St. Lawrence River. The Ottawa River provides drinking water to millions of people. Over 130 municipalities in Quebec – including each of the 82 municipalities of the Montreal Metropolitan Community (MMC) – have passed strongly-worded council resolutions opposing the proposed megadump.

CCNR believes that, for our government to proceed with such irreversible projects that can affect the health and safety of future generations for thousands of years to come, without benefit of a federal policy on radioactive waste that is firmly rooted in a societal consensus and based on extensive consultation with First Nations and other Canadians – in order to arrive at a scientifically and ethically acceptable approach to the management of long-lived radioactive waste materials – amounts to an abdication of responsibility.

There has been no satisfactory response from Ottawa to the CCNR letter.

See www.ccnr.org/Trudeau_pack_5_e.pdf.

If I can be of further assistance do not hesitate to contact me. I will be happy to answer any questions.

Best wishes,

Gordon Edwards, PhD, President,
Canadian Coalition for Nuclear Responsibility,
Scientific Advisor to Physicians for Global Survival.

www.ccnr.org