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## A Yucca Mountain in the Heart of the Great Lakes?!

The “Bruce Nuclear Power Development” is located on the eastern shoreline of Lake Huron in Ontario, Canada. Its 9 reactors ranks it as one of the largest single nuclear plants in the world.(1) Bruce was originally owned and operated by the Canadian government utility Ontario Hydro. Hydro’s successor company, Ontario Power Generation (OPG), leases the Bruce reactors to Bruce Power, a partnership comprised of financially-desperate British Energy (82%), Cameco Corporation (15%), and the two main workers unions at Bruce.(2) The oldest Bruce reactor, Douglas Point, permanently closed down in 1984.(3) The 4 Bruce “A” CANDU pressurized heavy water reactors have been shut down since 1998 as part of a “Nuclear Asset Optimization Program,”(4) nukespeak for OPG’s effort to deal with utility-wide safety, maintenance, management, and financial problems. Bruce hopes to re-start 2 of its “A” reactors by the middle of next year.(5)

In addition to its concentration of reactors, Bruce is also the disposal site for all of Ontario’s commercial radioactive waste. 20 of Canada’s 22 commercial reactors are owned by OPG and located in Ontario: 8 at Bruce, plus 4 at Darlington and 8 at Pickering on the shoreline of Lake Ontario.(3) All of the “low” and “intermediate” level radioactive wastes from these 20 reactors are sent to Bruce for “processing.” The wastes are either incinerated into ash, compacted, baled, or stored “as is” in both above ground and below ground structures and containers. From the the mid-1960’s to the mid-70’s, “incineration” meant an open-air “pit in which combustible wastes were burned.” A replacement incinerator operated from 1976 to 2000 emitted levels of toxic dioxins and furans hundreds of times in excess of 1992 Canadian Council of Ministers of the Environment regulations. This was allowed even after 1992 because the guidelines only applied to new incinerators. Bruce planned to replace its old incinerator in 2002.(6)

Just as reactor operations deposit airborne tritium precipitation onto local farms, and discharge tritium into Lake Huron, tritium is leaking into the groundwater at Bruce’s waste dumps. Due to leakage at “Radioactive Waste Operations (RWO) Site 1,” OPG has decided to transfer those wastes into “RWO Site 2.” But Site 2 is also leaking tritium into the groundwater. In Dec., 1995, the already permissive “operating target” of 2,040 Bequerels/Liter at RWO Site 2 was violated (US Environmental Protection Agency drinking water standards limit tritium levels to 740 Bq/L; an Ontario government advisory committee recommended only allowing 20 Bq/L in drinking water). In response, the Atomic Energy Control Board (AECB, Canada’s regulatory agency, now called the Canadian Nuclear Safety Commission, CNSC) simply increased the permissible “operating target” by 500%, to 10,175 Bq/L! Despite this, the regulatory agency has predicted that tritium leakage will violate even this weakened regulation by next year.(6) The tritium plume has contaminated a swamp that straddles the boundary between Bruce and the Inverhuron Provincial Park, with its nearby drinking water well used by park visitors. As nearby “Lake Huron is the ultimate receptor of groundwater,”(7) such tritium contamination could eventually impact local communities’ drinking water supplies, not to mention those downstream in both the U.S. and Canada. Currently, there are over 50,000 cubic meters of “low” and “intermediate” waste at Bruce. An additional 7,000 cubic meters is “processed” every year.(8)

Now OPG is proposing to build a dry cask storage facility for high-level radioactive waste at Bruce that would be 100 times bigger than any such facility currently on the U.S. shorelines of the Great Lakes. Dwarfing the Palisades nuclear plant dry cask storage facility with its 18 outdoor silos on Lake Michigan in southwest Michigan, OPG plans to install nearly 2,000 dry storage casks to store 18,000 tons of high-level radioactive waste. That is the amount already sitting in the almost full cooling pools at the Bruce reactor buildings. It is projected that the Bruce site will generate an additional 18,000 tons of high-level waste in the next 15 years. The grand total of 36,000 tons would be equal to about half the amount targeted to be buried at Yucca Mountain, Nevada.(9)

In Dec., 1997 Hydro prepared an environmental assessment for its proposed Bruce dry cask facility. The assessment was successively approved by the AECB (now CNSC), the Canadian Environmental Assessment Agency, and finally the Canadian Minister of the Environment. Each agency concluded that the project was “not likely to cause significant adverse environmental effects.” However, the design of the Bruce “Western Waste Management Facility” was changed

very late in the construction licensing process by Hydro. Hydro had originally proposed a specially designed “Bruce Dry Storage Container,” then (after the period of public comment had ended) switched its choice to the “Pickering Dry Storage Container” design. The original design called for Bruce-specific dry casks to be stored in the “open air,” around 1,250 containers essentially sitting in a field on a concrete pad. But Hydro abruptly changed the design to “Pickering” dry casks. As Pickering containers hold less irradiated fuel, this increased the number of containers proposed to nearly 2,000. In a comparison performed by Hydro, the Bruce container was judged superior to the Pickering container in 8 of 11 categories. The Pickering container was judged superior in only one: “financial integrity” (i.e. it was cheaper). In addition, a storage building was added to the design, perhaps to compensate for the increased level of radiation expected to be emitted by storing Bruce waste in Pickering containers. AECB labeled the changes “major” and suggested public notification and opportunity for public comment was necessary. But Hydro pressured AECB and the license to build the waste facility was granted, based on a reference design which was no longer applicable, and without any public notice or opportunity for comment.

Alarmed by the sudden design changes that had been rubberstamped despite never having been quantitatively analyzed, concerned citizens near Bruce turned to the Canadian courts in May, 1999. A volunteer community group, the Inverhuron and District Ratepayers Association (IRDA) sought further information on the design changes, and called for an independent Environmental Assessment by a full panel of experts under the Canadian Environmental Assessment Act. The courts, however, declared they were not “an academy of science” and were not qualified to rule on the issue. IRDA appealed to the Supreme Court of Canada, which reviewed the case but declined to hear it. Adding insult to injury, the Canadian courts not only ruled against IRDA, but also fined it \$100,000! IRDA had already incurred significant legal costs.(10)

Similarly, the Chippewas of Nawash First Nation submitted extensive comments to the Canadian Environmental Assessment Agency in November 1998, expressing tribal opposition to the proposed dry cask facility as a threat to their treaty rights to fish the waters of Lake Huron near Bruce.(11) The Canadian authorities disregarded the tribe’s concerns.

Perhaps because they were so busily engaged in the intense fight against the Yucca Mountain dump (to name but one struggle), nuclear watchdogs in the U.S. knew little, if anything, about developments at Bruce. This has changed in recent months as Canadian nuclear watchdogs have reached out for help in fighting waste expansion at Bruce. After all, radiation does not respect national borders, and the U.S. shoreline in Michigan is only 50 miles across Lake Huron from Bruce.

On Sept. 13, 2002 representatives from NIRS, Coalition for a Nuclear-Free Great Lakes in Michigan, and Great Lakes United in New York State traveled from as far away as 570 miles to join Canadian allies from IRDA, Coalition for Nuclear Responsibility, Campaign for Nuclear Phaseout, and Citizens for Renewable Energy at a CNSC hearing in Ottawa. The U.S. intervenors’ protested at having been kept in the dark by the Canadian government despite clear cross-border impacts, and their warnings -- that such a large-scale, high-profile facility and concentration of nuclear risk would be a radioactive bull’s eye in the heart of the Great Lakes and a terrorist’s dream come true -- were carried widely by Ontario newspapers and the Canadian Broadcasting Corporation (see, for example, the Toronto Sun’s September 14 “Nuke plant called terror target”). Despite this, CNSC publicly announced its approval of OPG’s application for coverage of its proposed dry cask facility under the Canadian Nuclear Liability Act -- the final legal hurdle before casks can be loaded at Bruce -- on October 23.(12) OPG was obviously very confident of CNSC’s approval, for it had already held its ribbon-cutting ceremony at the proposed dry cask facility on Oct. 9, two weeks earlier!(13) Loading of the first dry casks at Bruce is now imminent.

This grassroots groundswell or resistance has alerted elected U.S. officials to take action. On Oct. 17, U.S. Senators Debbie Stabenow and Carl Levin (Democrats from Michigan) wrote a letter to U.S. Secretary of State Colin Powell expressing their concern about the Bruce dry cask proposal. Writing “the Bruce complex would store more than 17 times the amount of radioactive waste at one site than is stored in the entire state of Michigan,” and that “in the wake of the events of September 11, 2001 [and] given the importance of the Great Lakes to tens of millions of Canadian and U.S. citizens for drinking water, fisheries, tourism, recreation, and other industrial and economic uses,” they called upon Powell to press the Canadian government on the matter.

Dismissing their concerns, the U.S. State Dept. responded on Oct. 29 that “each dry storage canister will have 24-inch thick concrete walls with steel inner and outer liners and a welded cap” and that “combined with other security

measures...will provide security for the material stored within” the Bruce dry cask facility.(14) In fact, the steel liners are only one inch thick altogether, and the concrete only 20 inches thick.(15) A 1998 U.S. Army test at Aberdeen Proving Ground in Maryland clearly showed that a TOW anti-tank missile, all-too-available on the international black market, can obliterate the concrete shielding surrounding dry casks; a second missile could then punch a hole right through the inner metal canister containing the high-level radioactive waste, releasing radiation into the environment.(16) Holes in security at Bruce were highlighted when, two weeks after the terrorist attacks of Sept. 11, 2001 a man whose boat had capsized on Lake Huron was able to squeeze through a gate, enter a building, and use the telephone to call for help without being detected.(17)

Dr. Gordon Edwards of the Canadian Coalition for Nuclear Responsibility worries about what would happen if a fully-fueled jetliner were to crash into Bruce’s proposed 2,000 dry casks. Would the casks be knocked over like bowling pins, and the irradiated fuel bundles damaged? Would deadly radioisotopes then be vaporized and released in the high-temperature, long-duration fire that would ensue? Dr. Edwards also points out that, under OPG’s design, the cask caps would not be welded on until the casks are transported a distance of a kilometer from the pools, along roads with steep ditches, to the dry cask facility, a safety/security vulnerability that the U.S. State Dept. letter does not address.(18)

Canada’s new Nuclear Fuel Waste Act comes into force on Nov. 15. It establishes a Waste Management Organization, comprised solely of nuclear industry representatives, to decide by 2005 whether to leave high-level radioactive waste where it is, permanently bury it in the Canadian Shield, or “temporarily” centralize it.(19) Given OPG’s decades-old practice of sending all its “low” and “intermediate” level wastes to Bruce, some fear that political momentum and cost cutting considerations could favor centralizing all of Canada’s high-level wastes for “interim” storage at Bruce.

Urge CNSC to require a full, independent Environmental Assessment and to conduct public hearings on both sides of the border concerning the re-start of Bruce A units 3 and 4. Send comments by Nov. 27 to: Guy Riverin, Environmental Assessment Specialist, PFTS Division - CCNS, Ottawa, Ontario K1P 5S9, Canada; fax 613-995-5086; e-mail [ceaainfo@cnsccsn.gc.ca](mailto:ceaainfo@cnsccsn.gc.ca). Urge your U.S. Senators, Representative and the Bush Administration to oppose any move by the Canadian government to centralize high-level radioactive waste storage on the shores of the Great Lakes, 20% of the planet’s surface fresh water!

(1) “Worldwide Commercial Nuclear Power Plants 2001” wall map, Nuclear News, American Nuclear Society, La Grange Park, IL, USA.

(2) BE is the UK's largest electricity generator, with 11 nuclear reactors in Britain, currently being kept afloat by a billion dollar British government loan. See “British Energy seeks to defer rate payments,” Financial Times, 2 November 2002. Cameco is the world's largest uranium fuel supplier, headquartered in Saskatoon, Saskatchewan, Canada. See <http://www.brucepower.com/company/index.html>

(3) “Great Lakes Nuclear Hot Spots” wall map, Nuclear Awareness News, winter 1990/91, Nuclear Awareness Project, Ontario, Canada.

(4) “Screening Report on Environmental Assessment of the Proposed Restart of Units 3 and 4 of Bruce A Nuclear Generating Station, Kincardine, Ontario,” Canadian Nuclear Safety Commission, October, 2002, pg. 3.

(5) “Bruce reactors will return to service on time, Ontario says,” Toronto Star, Sept. 7, 2002; also [http://www.friendsofbruce.ca/NoticeBoard/Bruce\\_A\\_Restart.html](http://www.friendsofbruce.ca/NoticeBoard/Bruce_A_Restart.html)

(6) Atomic Energy Control Board of Canada memos dated Aug. 27, 1996 (BMD 96-148, p. 1) and 2000-03-07 (BMD 00-44, pgs. 2-5). See “Facility Description” sections. See also “Bruce site leaks nuclear waste,” Toronto Star, July 5, 2000.

(7) CNSC Screening Report, p. 27.

(8) “Managing Ontario Power Generation Low and Intermediate Level Radioactive Wastes,” Bruce Nuclear Power Development Audio Visual brochure 3762, June 1999.

(9) <http://www.friendsofbruce.ca/IRs/Powell-Senators-regulations-IR14-2002.html>

- (10) [http://www.friendsofbruce.ca/IRs/Paper\\_Trail\\_IR\\_10.html](http://www.friendsofbruce.ca/IRs/Paper_Trail_IR_10.html)
- (11) <http://ccnr.org/nawash.html>
- (12) [http://www.nuclearsafety.gc.ca/eng/media/press/news\\_release.cfm?news\\_release\\_id=47](http://www.nuclearsafety.gc.ca/eng/media/press/news_release.cfm?news_release_id=47)
- (13) [http://www.opg.com/info/news/NewsOct09\\_2002.asp](http://www.opg.com/info/news/NewsOct09_2002.asp)
- (14) Paul V. Kelly, Assistant Secretary, Legislative Affairs, U.S. Dept. of State to Sen. Stabenow, Oct. 29, 2002.
- (15) Personal communication to author from Normand de la Chevrotiere, IDRA, Nov. 1, 2002.
- (16) International Fuel Container video of Aberdeen test; see <http://www.nirs.org/dontwasteamerica/SLD-1-TOW.htm>
- (17) [http://www.citizen.org/cmep/energy\\_enviro\\_nuclear/nuclear\\_waste/hi-level/yucca/articles.cfm?ID=8470](http://www.citizen.org/cmep/energy_enviro_nuclear/nuclear_waste/hi-level/yucca/articles.cfm?ID=8470)
- (18) Personal communication to author, Oct. 30, 2002.
- (19) “Canada looks to solve nuclear question,” Owen Sound Sun Times, October 30, 2002. See “New Canadian nuclear waste management group starts work - 10/30/02” under “Latest News” at <http://www.friendsofbruce.ca/>