

Northeastern Ontario - On the Uranium Trail

Speaking Notes for Presentation by Brennain Lloyd on behalf of Northwatch Citizens' Inquiry into the Impacts of the Uranium Cycle

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Introducing Northwatch

- Northwatch is a coalition of community based environmental and social justice / social development organizations across northeastern Ontario. Founded in January of 1988, Northwatch has as a priority issues that are of a regional nature : energy use, generation and conservation; forest conservation and wild areas protection; waste management and water quality issues; mining; and militarization. In addition to acting on these issues as a representative body, Northwatch provides support to local citizens groups addressing these and other environmental concerns in their community
- celebrating 20 years of work as an anti-nuclear organization next Saturday at our annual general meeting on Manitoulin Island
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Northeastern Ontario's Uranium connection

- uranium mining began in the 1950s of uranium mining in the Elliott Lake Basin, leaves a legacy of 200 million tonnes of radioactive tailings in that area, radioactive tailings that are also acid-generating, Rio Algom and Denison's approach has been to flood and flee, to put water on those tailings and then be relieved of their responsibilities,
- uranium refinery in the Blind River area, history includes significant accidents, absence of community reporting, ongoing contamination with plans to increase it
- a history of reactor siting in our region.
- extensive exploration for uranium in the region, particularly in Algoma District, including the Elliot Lake area / Serpent River basin
- past proposals to move both low level and high level nuclear waste to northeastern Ontario; expect the next serious push to begin in September when the Nuclear Waste Management Organization launches its site search for a "willing host"
- much can and should be said about each of these connections and the many related concerns; for today's presentation will focus on the uranium refinery in Blind River, both because of its unique place in the nuclear chain and the journey uranium makes from ore to bomb, and because of significant expansions that are currently proposed or under way

Cameco's Uranium Refinery, Blind River

- Cameco operates and owns a controlling interest in the world's largest high-grade uranium mines and mills at McArthur River, Key Lake and Rabbit Lake, located in northern Saskatchewan. Through its wholly owned US subsidiaries, the company also obtains uranium production from operations at Smith Ranch-Highland in Wyoming and Crow Butte in Nebraska.
- Cameco is the world's largest, low-cost uranium supplier providing almost 20% of world

mine production.

- Cameco is a producer of nuclear electricity through a partnership arrangement with Bruce Power, which currently operates six nuclear reactors in Ontario.
- Cameco is 100% owner and operator of Canada's only uranium refining and conversion facilities, located in Ontario. These include the Blind River refinery, the world's largest, where uranium concentrates are processed into high-purity uranium trioxide (UO₃), an intermediate product used as feed at the company's Port Hope conversion plants.
- The Blind River refinery processes uranium concentrates from Cameco's mining operations, as well as from other Canadian and foreign producers.
- includes a uranium trioxide (UO₃) processing plant, water treatment plant, power plant, nitric acid recovery system and analytical lab services
- refinery produces UO₃, a high-purity intermediate product, shipped to Cameco's Port Hope conversion facility for further processing; also shipping UO₃ to Springfields, UK for toll conversion to UF₆ - utilizing unused production capacity
- licensed production capacity of 18,000 tonnes of uranium per year, currently seeking approval from the CNSC and the MOE for expanded production and increased releases, respectively
- receives drums of uranium ore concentrates from mines around the world including in Canada, Australia and the United States and "other countries"
- The facility began operating in 1983

The Uranium Chain

- uranium is mined in Saskatchewan (mines in Ontario closed in the mid-1990s) using both open-pit and hard-rock mining; ore concentration ranges from less than 1% to up to 20%
- The ore is crushed and ground in the mill to the consistency of fine sand from which the uranium is extracted chemically to produce the impure concentrate known as "yellowcake."
- After the uranium is extracted, the bulk of the ore remains as the mineral residue known as "tailings"; these are slightly radioactive, due to the presence of other naturally occurring radionuclides such as radium and thorium.
- Only one Canadian company, Cameco Corporation, refines and converts the uranium "yellowcake"
- Cameco was formed in 1988 by the merger of the federal Crown corporation Eldorado Nuclear, and the provincial Crown corporation Saskatchewan Mining Development Corporation (SMDC), the initial step toward the eventual privatization of the two governments' uranium interests.
- Cameco's uranium refinery is located in Blind River, Ontario, on the north shore of Lake Huron, close to the Elliot Lake area. It was built by Eldorado Nuclear in the early 1980s, to replace an older refinery that had operated at the Port Hope site. The Blind River refinery, which began operating in 1983, has capacity of 18,000 tU/year as UO₃, making it the largest uranium refinery in the western world.
- From Blind River, the UO₃ is transported by road to Port Hope, Ontario, where the bulk is converted to UF₆ in the "West UF₆" plant, which has a capacity of 10,500 tU/year.⁽⁵¹⁾ It began operation in 1984, replacing the older East UF₆ plant on the Port Hope site. The rest of the UO₃ is converted in the South UO₂ plant to the ceramic grade UO₂ which will be shipped to fabricators of the fuel bundles for use in CANDU reactors. The capacity of the UO₂ plant is 2,500 tUO₂/year.⁽⁵²⁾

- fabrication of fuel elements is the final step in the production of nuclear fuels. Two Canadian companies fabricate fuel elements, Canadian General Electric Incorporated (CGE) and Zircotec Precision Industries Incorporated. CGE has two plants: one in Toronto where the pellets are made and the other in Peterborough, Ontario, where the fuel bundles are assembled. The plant capacities are 1,050 tU/year and 1,000 tU/year respectively.⁽⁶²⁾ The Zircotec plant in Port Hope, Ontario, produces both fuel pellets and assembled fuel bundles.
- For the uranium enrichment market (non-CANDU reactors around the world), the UO₃ is converted into uranium hexafluoride gas (UF₆) and then exported (Canada has no uranium enrichment facilities); for the CANDU market, the UO₃ is further reduced to uranium dioxide (UO₂). This black powder is then pressed into cylindrical form and sintered, creating a ceramic UO₂ fuel pellet, a little over a centimetre in both diameter and length. At CANDU-fuel manufacturing plants like Zircotec Precision Industries Inc. in Port Hope, Ontario, and General Electric Canada in Peterborough, Ontario, these pellets are inserted into metal tubes (Zircaloy) about half-a-metre in length. These tubes are then capped and welded shut, and thirty-seven of them are assembled into a standard CANDU fuel bundle, weighing approximately 20 kg.

Blind River Uranium Refinery

- in the first four years of operation (1983 -1987), uranium concentrations increased in vegetation in 5 of 6 test locations; including at all test locations within 1,200 metres of the refinery site; concentrations in trembling aspen foliage increased from 0.02 parts per million (ppm) to 2.73 ppm; levels were detected in all edible plants sampled, with concentrations as high as 0.67 in bunchberries; natural background concentrations are in the range of 0.005-0.06¹
- in May 1990, the refinery “accidentally” emitted 178 kg of uranium dust into the atmosphere when maintenance workers failed to close a valve which allowed the uranium dust to bypass the dust collectors and travel directly out the stack for a 26 hour period; the Atomic Energy Control Board (now the CNSC) called the event “extremely abnormal” and revoked Cameco’s license for one week
- overall uranium emissions have remained in the 12-15 kg/year range over the last several years, Cameco has noted to the CNSC that “while the total over the last few years has increased slightly because the number of operating days has increased, there has been continued focus and success in reduction of emissions on an operating unit basis”.²
- lung count dose rates have, overall, increased during the last licensing period and average and maximum whole body and skin dose results for employees at the refinery show troubling trends; for example, average whole body does was higher in 2005 than it was in either 2002 or 2004 and average skin dose was higher than it was in 2002 or 2004; maximum skin dose was almost double in 2005 than it was in 2002
- uranium in soil concentrations at the Refinery’s perimeter “averaged less than 4 ppm of

¹“Uranium Levels High Within Metres of Plant”, Sault Star, Spring 1990

²Record of Proceedings, Including Reasons for Decision, Cameco Corporation Application for the Renewal of the Nuclear Fuel Facility Operating Licence for Cameco Corporation’s Refinery in Blind River, Ontario Hearing Dates October 5 and December 13, 2006

- uranium”; this is more than double background level, and is the average;
- weekly average uranium emission rate from the Refinery’s incinerator stack was exceeded twice in the spring of 2002 and the daily DCEV uranium emission rate was exceeded once in December 2002.³
- refinery is licensed by the Canadian Nuclear Safety Commissions; license was renewed in March 1, 2007 for a five year period, ending February 29, 2012
- in addition to the “routine” licensing exercises conducted by the Canadian Nuclear Safety Commission, there are three expansion-related exercises underway or recently completed, two by the Canadian Nuclear Safety Commission and one by the Ontario Ministry of the Environment

Expansion of Incinerator and Import of Wastes from Port Hope

- The screening report states, in describing the scope of the project, that *“To meet future Canada wide standards and provincial emission requirements, Cameco proposes to upgrade the hazardous waste incinerator at Blind River with improved technology for incineration control, new pollution abatement equipment, and on-line monitoring equipment. The upgraded incinerator will handle contaminated combustible waste from both Cameco’s Blind River and Port Hope Operations. As part of the upgrade, Cameco Blind River is looking to install an oil injection system to supplement the natural gas consumption and to allow for the incineration of contaminated used oil from both operations and subsequent uranium recovery from ash. Materials, including used oil, will be shipped from Port Hope to Blind River for incineration by road transport. No new wastes will be generated with this project.”*
- The screening report indicates that exposure levels / emissions will increase, despite the modifications to upgrade the pollution control equipment. Increases are expected as a result of increased production (subject of a separate environmental assessment) and the addition of Port Hope wastes to those Blind River wastes that are currently being incinerated.

Expanded Production

- Cameco is currently undergoing an environmental assessment of a proposal to increase their licensed production capacity from 18,000 tonnes/year to 24,000 tonnes/year
- CNSC released the draft screening report on April 18th, for a comment period ending May 16th (excerpt below)

During operation of the project with the production increase, nitrogen dioxide (NO2) and uranium concentrations are predicted to have a measurable increase above existing levels along the property fence line. However, immediately beyond the fence line, where human receptors are present, the predicted NO2 and uranium in air concentrations would be below applicable criteria.

³Northwatch’s preliminary comments to the CNSC on Cameco Corporation Application for the Renewal of the Operating Licence for the Blind River Uranium Refining Facility, November 2006

Small quantities of radioactivity and radiation would be released during operation of the Refinery. The incremental doses associated with the production increase would be very small, significantly below the CNSC regulatory limit, and therefore not significant.

Amendment to Basic Comprehensive Certificate of Approval (Air)

- Cameco Corporation is proposing an amendment to their Basic Comprehensive Certificate of Approval (Air) which includes the addition of new or historically unapproved sources for all emissions from Cameco Corporation, Blind River Refinery of uranium ore.
- A notice of the proposed amendment was posted on Ontario's Environmental Bill of Rights electronic registry indicated that the public had thirty days to comment on the proposed amendment.
- the Sault Ste. Marie area office of the Ministry of the Environment forwarded a copy of the application to the North Bay area office of the Ministry of the Environment and we reviewed the document at that location.
- It appears that the Ministry of the Environment has allowed consultants for Cameco Corporation to set the limits for uranium emissions to air; this is not an acceptable practice on the part of the Ministry of the Environment and does not result in a reliable or credible limit or standard
- The proposal does not appear to include a total loading or total release limit
- The documents provided by the Company and their consultants were incomplete in the information provided; for example, the "EMISSION SUMMARY AND DISPERSION MODELLING REPORT " included the following deficiencies:
- The discussion of the incinerator modifications in Section 1.1 does not include any discussion or acknowledgement of the waste shipments from Port Hope to Blind River which will include radioactive waste and uranium contaminated oil
- The close proximity of the Mississaugi First Nation is not even mentioned in the description of the facility and its location in Section 5, let alone discussed (it is identified on the "Site Location Plan" map
- In the assessment the quality of the data (upon which the application relies) in Section 4.4 the consultants reports states that "Emissions of CO, Nox, SPM, HCl, HF and Sox from the Incinerator Stack were based on the manufacturer's guarantee"; a manufacturers guarantee is not a sufficient basis for granting a certificate of approval (we will resist making reference to the many "as seen on TV" manufacturers guarantees of similar value)
- Also in Section 4.4 the consultants reports states that "these emissions are deemed to have an "Average" data quality rating"; average may suffice if we are evaluating incomes or grade school academic achievement, but it is does not suffice when we are evaluating the quality of data upon which a decision will be made that allows an operator to release contaminants into the air, particularly when one of those contaminants in uranium

Concluding Remarks