



MiningWatch Canada

Mines Alerte

Suite 508, 250 City Centre Avenue, Ottawa, Ontario, Canada K1R 6K7
tel. (613) 569-3439 — fax: (613) 569-5138 — info@miningwatch.ca — www.miningwatch.ca

Uranium Mining in Canada – Past and Present

***Background notes for a presentation to the Indigenous World Uranium Summit
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Jamie Kneen, MiningWatch Canada

Historic Mines – underground mines, tailings unconfined at older mines (dumped on land and/or in lakes) and in dry or underwater dams (natural lakes or valleys) at newer mines (1950s and later):¹

- Port Radium (Eldorado mine), Northwest Territories
 - Pitchblende was discovered at Great Bear Lake in the Northwest Territories in 1930. In 1943, in order to gain control of all sources of uranium in their respective countries, the governments of Canada, the United Kingdom and the United States banned all private exploration for, and development of, radioactive materials. The federal government established a Crown corporation, Eldorado Mining and Refining Limited, to oversee Canadian uranium interests. This company expropriated the uranium mine at Port Radium and was given a monopoly in all uranium prospecting and developing activities.² The Port Radium site was decommissioned in 1984. Clean-up and reclamation work recently undertaken.
- Rayrock mine, Northwest Territories
 - Staked in 1948; development underway by Rayrock Mines Limited in 1955. Production commenced in 1957 and ceased due to lack of economic reserves in 1959. A small townsite built by the company was in operation during this period. The mine employed 135 men in 1958 and the townsite had 20 families as residents. The Rayrock site was abandoned in 1959.³ Indian and Northern Affairs Canada began the decommissioning and rehabilitation of the Rayrock site including capping of the tailings in 1996. Environmental monitoring of long-term performance of the decommissioned site began in 1998.
- Bancroft, Ontario

¹ Details of tailings amounts, disposal, and chemical and radiological characterization are mostly not included here.

² http://interactive.usask.ca/ski/mining/search/mineral_types/energy/uranium/history_uranium.html

³ Inventory of Radioactive Waste in Canada LLRWMO-GN-TR-99-037. Low-Level Radioactive Waste Management Office, November 1999 <http://www.llrwmo.org/en/programs/ongoing/inventory.pdf>

- Madawaska Mine/Faraday Mine Discovered and originally staked in 1949 by A.H. Shore of Bancroft. Underground development started in 1954 by Faraday Uranium Mines Ltd. Production started 1957 and lasted until 1964 when contracts to sell uranium expired. Mining operations were resumed in 1975 by Madawaska Mines Ltd.; the 444m shaft was deepened to 473m. Production began in 1976 and lasted until 1982. Other workings underground include a 50m shaft and three adits. 2,544,716 tons of ore were produced, averaging .1074% U₃O₈.⁴ AEC West Ltd. has completed decommissioning activities at the Madawaska site.
- Operations at the Dyno and Bicroft sites ceased in the early 1960s. AEC West is completing rehabilitation activities at the Dyno Mine; Barrick Properties has been carrying out decommissioning activities at the Bicroft Mine.
- Agnew Lake (north of Espanola, Ontario)
 - The mine was operated by Kerr Addison Mines Ltd. between 1977 and early 1983 and produced a total of 855,000 kg of U₃O₈ from approximately 2.8 million tonnes of ore. The underground mine was developed to over 980 m in depth.⁵ The site was turned over to the province in the early 1990s.
- Elliot Lake, Ontario
 - Uranium discovered in 1953
 - The Lacnor Mine operated from 1957 to 1960, producing 2.7 million tonnes of waste. (Rio Algom)
 - The Nordic Mine operated from 1957 to 1968 and produced 12 million tonnes of waste. (Rio Algom)
 - The Panel Mine and Mill produced uranium from 1958 to 1961, and then again from 1979 to 1990. It produced 16 million tonnes of waste. (Rio Algom)
 - The Pronto Mine and Mill processed 2.1 million tonnes of uranium ore between 1955 and 1960, when the mill was converted to process copper. Copper processing continued until 1970. The Pronto Mill produced 4 million tonnes of waste. (Rio Algom)
 - The Quirke Mine (1 and 2) and Mill operated from 1956 to 1961, and then from 1968 to 1990. It produced 46 million tonnes of tailings and waste rock. (Rio Algom)
 - The Spanish-American mill operated from 1958 to 1959 and dumped 400,000 tonnes of waste in Oliver Lake. (Rio Algom)
 - The Milliken and Stanleigh mines and mills produced 20 million tonnes of waste and tailings. The Milliken mill operated from 1958 to 1964, and the Stanleigh mill operated from 1957 to 1960, and again from 1983 to 1996. (Rio Algom)
 - Denison Mines Limited operated in Elliot Lake from 1957 to March 1992, producing about 70 million tonnes of waste at the Stanrock (inactive since 1964), Can-Met, and Denison (inactive since 1992) mines.
 - By 1976 all 55 miles of the Serpent River system were badly contaminated with acid generating, highly radioactive wastes. An official Ontario report noted that there were no living fish in the entire river located downstream from the mining wastes.
 - In 1978 alone, more than 30 tailing dam failures were reported.
 - In August 1993, two million litres of contaminated water spilled from a tailings site at Rio Algom's Stanleigh mine as a result of a power failure. Rio Algom was charged by the Atomic Energy Control Board with one count of failure to provide appropriate training for its employees, and one count of failure to prevent the spill under "reasonably foreseeable

⁴ <http://www.mindat.org/loc-542.html> Ref.: Geol. Survey of Canada, Misc Report 39; Rocks & Min.:59:206-210

⁵ Ontario Geological Survey Open File Report 6185: Report of Activities, 2005 Resident Geologist Program, Kirkland Lake Regional Resident Geologist Report: Sudbury District, 2006
<http://www.mndm.gov.on.ca/mndm/mines/ims/pub/roa/roapdfs/ofr6185.pdf>

circumstances”. The radiologically and chemically contaminated water spilled into McCabe Lake.

- Uranium City, Saskatchewan
 - Uranium deposits were first found at Goldfields in the Beaverlodge area north of Lake Athabasca in 1935-36. In 1944 Eldorado staked mineral claims in the region. In 1946 the Atomic Energy Control Act was passed in the House of Commons to regulate all operations of the industry. Regulation was administered from Ottawa by the Atomic Energy Control Board. By March 1951 and after further exploration in the area, sufficient ore deposits had been identified to warrant a mine and mill. Production commenced in May 1953 and exploration activity increased, resulting in further finds and the establishment of as many as 12 uranium mines and three mills in the Beaverlodge area by 1958. Eldorado operated the Beaverlodge mine and mill continuously for 29 years, closing in 1982.
 - In 1952 the town of Uranium City was established in the area of Beaverlodge. Buildings from Goldfields were moved to the site.
 - In 1955, Gunnar Mines Limited, a private uranium mining company, began production in the Beaverlodge area.
 - In 1957, Lorado Uranium Mines Limited, a private company, began production in the Beaverlodge area. Numerous small mines like Nisto operated in the Beaverlodge area, using Eldorado and Lorado milling facilities.
 - In 1960, Lorado Uranium Mines Limited closed.
 - In 1964, Gunnar Mines Limited closed due to depletion of ore body. Eldorado was the only uranium production company in Saskatchewan.
 - Between 1953 and 1982 Eldorado mines in the Beaverlodge area produced some 45 million lbs of uranium concentrate (U_3O_8). Production of ore and yellowcake peaked in 1959/60 and 1967/8.
 - The Beaverlodge operation was decommissioned in 1985 and is monitored by Cameco.

“Modern” mines: All are in northern Saskatchewan. Open pit and underground operations, some using freezing and remote control mining techniques; tailings in surface dams and mined-out pits using “hydraulic containment” to control groundwater contamination:⁶

- Cluff Lake (Areva):
 - Discovered in 1971
 - Mining began in 1980
 - Deposits include: OP underground mine (1983-85), Dominique-Janine open pit mine (1989-90) and extension (1994-97), Janine North open pit mine (1990-91), Dominique Peter and Dominique Janine West mines (1998-1999), and West Dominique Janine underground mine (1994-2002)⁷
 - Mill initially separated radioactive components of tailings for storage in concrete barrels, which leaked.
 - On March 24, 1998, the AECB (Atomic Energy Control Board) denied a two year licence renewal. Instead, AECB approved an extension to the licence expiring March 31, 1998 for nine months, subject to several conditions. This decision reflects a number of deficiencies identified by AECB at the Cluff Lake site:
 - the recent detection of increased radium levels in a lake located next to the tailings management facility,

⁶ Ore reserves and details of processing and tailings disposal are not included here.

⁷ <http://www.ir.gov.sk.ca/dbsearch/MinDepositQuery/default.aspx?ID=2153>

- the recent twofold increase in workers' radiation exposure,
- the insufficiency of the tailings management facility's capacity (by the end of 1996, there was capacity for a production of one more year, while mining is scheduled to continue for ten years),
- Cogema's inadequate project management capabilities at Cluff Lake.⁸
- Closed 2002

- Key Lake (Cameco/Areva):
 - Discovered in 1975
 - Mining began in 1983
 - Open pit mines and mill
 - Gaertner ore body mined out in 1987
 - In September, 2004, the Canadian Nuclear Safety Commission approved the renewal of the mining operating licence for the Key Lake Operation although the tailings disposal in the Deilmann open pit suffers from periodic sloughing of the pit sidewalls. One million cubic metres of sand have already slumped into the tailings, and another half a million cubic metres may follow. This sloughing not only decreases the capacity of the tailings disposal facility, it moreover distorts the performance of the facility in the long term which is based on the impermeability of the tailings.
 - Still operating as mill for McArthur River ore; Deilmann pit to receive tailings

- Rabbit Lake/Collins Bay (Cameco):
 - Discovered in 1968
 - Mining started in 1975
 - Deposits include mined-out original Rabbit Lake open pit and Collins Bay A-, B- and D-zone pits as well as Eagle Point underground (incline access) mine
 - In 1989, 2 million litres of radioactive water spilled into Wollaston Lake; the company was charged and eventually pled guilty, attracting a \$5000 federal and a \$55,000 provincial fine.
 - Eagle Point still in operation
 - Mill to process half of Cigar Lake ore

- McArthur River (Cameco/Areva):
 - Discovered in 1988
 - Mining began in 1999
 - Ore is frozen and removed by raise boring and boxhole boring remote mining methods and slurried to surface for milling
 - On April 7, 2003, Cameco suspended production due to underground flood; resumed operation on July 2, 2003.

- McClean Lake (Areva):
 - Discovered in 1979
 - Mining began in 1995
 - JEB open pit, McClean North & South underground mines, Sue C open pit
 - Open pit and underground mines

- Cigar Lake (Cameco/Areva/Idemitsu/KEPCO)
 - Discovered in 1981
 - Jet boring remote mining method proposed
 - Underground flooded October 23, 2006 – production development delayed at least 2 years

⁸ AECB News Release 98-07 http://www.aecb-ccea.gc.ca/news_rel/9807_e.htm

- Midwest (Denison/Areva/OURD):
 - Underground test mine – not yet developed

Exploration – a long way from mine development even in previously explored areas; 3-5 years at the earliest

- Athabasca Basin (northern Saskatchewan) – unconformity-type deposits
- Thelon Basin (Northwest Territories/Nunavut) – similar to Athabasca Basin
- Southern British Columbia – uranium-rich sedimentary strata like Wyoming's
- Labrador and western Newfoundland – lower-grade but substantial deposits

Commissions of Inquiry and Environmental Assessments (EAs)

- Bayda Commission, a.k.a. Cluff Lake Board of Inquiry (Province of Saskatchewan, 1977-1978)
- Kitts-Michelin Uranium Project (Province of Newfoundland, 1979)
- Key Lake Board of Inquiry (Province of Saskatchewan, 1979)
- Bates Commission, a.k.a. Royal Commission of Inquiry into Health and Environmental Protection in Uranium Mining in British Columbia (1980)
- Nova Scotia Uranium Inquiry under Mr. Justice McCleave (1985)
- Kiggavik Environmental Assessment Panel (federal, 1989-90)
- Environmental Assessment Panel: Rabbit Lake Uranium Mining (federal, 1993): expansion of the Rabbit Lake mine to include Eagle Point underground mine and A- and D-Zone open pit operations.
- Joint Federal-Provincial Panel on Uranium Mining Developments in Northern Saskatchewan (1991-1997): Environmental Assessment of McArthur River, Cigar Lake, Deilmann Pit (Key Lake), McClean Lake and Midwest Projects.

Environmental Assessment Issues

McLean Lake Court Case

- On July 22, 1999, ICUC applied to the Federal Court, Trial Division to review the AECB's decision to licence the grant an operating licence for the JEB Uranium Tailings Facility at the McLean Lake uranium mine without a full environmental assessment.
- On September 23, 2002, Federal Court Judge Campbell ruled that a Judicial Review was necessary for the AECB decision. The operating licence for the JEB nuclear waste facility is quashed; the mine continues to operate without a licence.
- On Nov. 7, 2002, the Federal Court of Appeal granted a stay of the Federal Court decision, allowing the mine to operate legally.
- On June 4, 2004, the Federal Court of Appeals overturned the Federal Court decision.
- On March 24, 2005, the Supreme Court of Canada dismissed ICUCEC's request to appeal the Federal Court of Appeal decision ***and awarded costs against ICUCEC***.

Rabbit Lake/Collins Bay A-zone Decommissioning

- On October 24, 2003, the Canadian Nuclear Safety Commission (CNSC) announced its decision to renew the operating licence for Cameco Corporation's Rabbit Lake uranium mine in northern Saskatchewan. As part of this licence, the company will be allowed to breach the dike that separates the mined-out Collins Bay A-Zone pit from Wollaston Lake itself. MiningWatch Canada was among the intervenors who demanded an environmental assessment of this decommissioning plan.

In fact, no environmental or public consultation information was brought before the Commissioners, although this did not seem to bother them.

- In a public meeting in spring 2003, people in the community of Wollaston Lake told the company in no uncertain terms they did not want the dike breached at all. The CNSC determined that breaching the dike is not “decommissioning” but rather part of the “ongoing site rehabilitation” and therefore no EA is required, much less meaningful consultation with the affected Athabasca Denesūliné First Nations and accommodation of their interests on Crown lands.

Joint Federal-Provincial Panel on Uranium Mining Developments in Northern Saskatchewan

- Serious weaknesses in Panel process led to two Panel members and several intervenors withdrawing:
 - Dr. Annalee Yassi, University of Manitoba occupational and environmental health professor, resigned from the panel on August 15, 1996.
 - John Dantouze, vice-chief with the Prince Albert Grand Council, and only aboriginal member of the panel, resigned from the panel on October 1, 1996.
 - The Inter-Church Uranium Committee (ICUC) withdrew from the participation in the review process.
 - The mayors of four Northern Saskatchewan communities announced on October 1, 1996, that they would not allow the scheduled public hearings to be held in their communities.

Cluff Lake Decommissioning

- On April 15, 2004, Environment Minister David Anderson announced that the decommissioning of the Cluff Lake Uranium Mine and Mill facility does not require further assessment by a review panel or mediator under the Canadian Environmental Assessment Act. The Minister referred the project, proposed by COGEMA Resources Inc., back to the federal responsible authority, the CNSC, for appropriate action.

Kiggavik Project

- In a March 26, 1990, municipal plebiscite the Baker Lake community voted 90.2% against the proposal.
- The EIS was deemed deficient by the Panel; on July 5, 1990 the proponent asked for “indefinite delay” in proceedings.⁹

Kitts-Michelin Project

- Brinex (British Newfoundland Exploration) discovered uranium in 1977 and planned an open pit mine at Michelin and an underground mine at Kitts. Brinex submitted a revised EIS in 1979 and the provincial government held public hearings; the Labrador Inuit Association and local people (Inuit and settlers) from Makkovik and Postville expressed strong opposition to the proposal and on May 29, 1980, Premier Brian Peckford announced a moratorium on uranium mining in the Province of Newfoundland, saying the proponent had failed to satisfy the government “it can and will safely and permanently dispose of the waste materials (tailings)” and that its social impact studies were “woefully inadequate”.¹⁰

Nova Scotia – A moratorium on uranium exploration, declared in 1984, expired on January 1, 1995.

British Columbia – In 1980, premier Bill Bennett bowed to public pressure and introduced a seven-year moratorium on uranium mining and exploration. It was not renewed.

⁹ *The Gulliver UG (Uranigesellschaft) Dossier*, <http://www.sea-us.org.au/gulliver/ug.html>

¹⁰ *The Gulliver File: Mines, people and land: a global battleground*. Roger Moody. Minewatch, London, 1992.