

yellowcake, may be transported by air or it may be transported by barge during the open water season to southern Canada.

The proposed operational mine life is approximately 17 years, with a 3 year pre-operational construction phase and a post-operational decommissioning period of approximately 5 years. However, the potential development of additional deposits in the proposed project area could extend the operating life of the project.

Project Components

a. Kiggavik Mine Site

Activities: The main base of the operations would be at the Kiggavik site, which is proposed to include open pit mining, power generation, ore processing, warehousing, administration and personnel accommodations. Mining and ore stockpiling at the Kiggavik site would begin as early as possible in the project schedule, while the mill start-up will be delayed until the first of the two tailings facilities is available. The three proposed open pits at Kiggavik would be mined using conventional drilling and blasting techniques, with ore and waste rock removal using mechanical excavators and trucks. Special waste would be segregated and temporarily stored during operation in a stockpile adjacent to the clean waste. During decommissioning, the special waste would be co-disposed with the tailings in the mined-out pits. Ore mined at Kiggavik and Sissons would be processed at the Kiggavik site and the uranium product extracted, commonly referred to as yellowcake, would be transported via truck to the Baker Lake port, barged to Churchill, and then sent by rail to southern Canada and/or the yellowcake could be transported directly via air to southern Canada.

Facilities (during operation): Three open pit mines (East Zone, Center Zone, Main Zone); explosives storage; waste rock and special waste management facilities; ore storage pads; haul roads; mill facility; water treatment facilities; water storage facility; tailings management facilities (*in-pit disposal concept*); hazardous material handling and storage facility; power house and fuel storage; aerodrome; warehouse; main maintenance shop; main administration complex; dry facilities and the accommodation complex.

b. Sissons Mine Site

Activities: The Sissons site would be located approximately 17 km southwest of the Kiggavik site. Two mines are currently planned at the Sissons site; the Andrew Lake open pit and the End Grid underground mine. Ore mined at Sissons would be hauled to the Kiggavik mill for processing. The Andrew Lake deposit occurs under the northern edge of Andrew Lake and at this time there are two proposed options for obtaining the ore. The first option is to dewater a portion of the lake by constructing a dyke across the lake. The second option proposed is to dewater all off Andrew Lake. The Andrew Lake open pit would be mined using similar techniques as for the Kiggavik open pit mines. For the End Grid underground mine, underhand drift-and-fill method would be used to access the ore. Mine wastes and special wastes would be managed at the Sissons site.

Facilities (during operation): Open pit mine (Andrew Lake); underground mine (End Grid); satellite explosives storage; waste rock and special waste management facilities;

water treatment plant; ore pad; backfill plant; fuel storage; satellite maintenance shop; satellite administration offices and dry facilities.

c. Baker Lake Dock Site and Storage Facility

Activities: The proposed location of dock site and storage facility are dependent on the road option selected for access to the Kiggavik site. A wharf would allow for the docking of two barges at a suitable location from the shore. Fuel would be offloaded to the tank farm via a pipeline constructed on the dock. The proposed Baker Lake storage facility would be used to store fuel, containers, supplies and other materials until they are brought to the Kiggavik site. In addition, yellowcake may be transported to the Baker Lake storage facility from the Kiggavik site and stored at the storage facility until shipped back with the returning barges. Supplies and fuel would be trucked to the Kiggavik site depending on the road option selected.

Facilities (during operation): Wharf; fuel storage/tank farm; storage facility, warehouse and laydown area; and satellite administration and community liaison office.

d. Road Transportation connecting Baker Lake to the Kiggavik area

A 90 – 100 km access road from Baker Lake to the Kiggavik area is proposed for the transportation of supplies and yellowcake. Currently, there is a winter trail that connects Baker Lake to the Kiggavik area; however construction and maintenance of a more substantial access road would be required. Several options for this access road are being considered and they include a winter road option and two all-weather road options.

i) Winter Road Option

Activities: The proposed winter access route would pass over approximately 50% ice while the remainder is overland. The road would be re-constructed every year by clearing the overland portions and flooding the over-ice portions. Trucks would travel in convoys for safety at a maximum speed of 30 km/h.

Facilities: Heated refuge stations along route.

ii) All-Weather Road Options

Activities: The project proposal includes two all-weather route options, a north route and a south route. The proposed north all-weather route follows alongside an existing ATV trail north of Baker Lake and crosses the Thelon River. Two possible methods of crossing the river have currently been identified: a bridge option and a cable-ferry/ice bridge option. The bridge option would allow the road to remain open year round.

The proposed south all-weather route would begin on the south shore of Baker Lake and continue west to the Kiggavik site. The south all-weather route appears to avoid major river crossings and reduce disturbance to the community of Baker Lake.

Regardless of the all-weather route option selected, the road would be based on a fill-only approach, which means that a fill base of suitable thickness is laid down to protect the permafrost.

Facilities: Borrow sources along the route(s); heated refuge stations; 435 metre long bridge with 5 spans (north route only) with four piers in the river.

e. Mobilization and Shipping

Activities: The required fuel, reagents and supplies for the Kiggavik project may be brought in via marine shipping and/or via rail. Fuel and supplies would be brought via ocean-going vessels or via rail to Churchill, Manitoba. Tug-barge vessels or ferries would then be used to transport the supplies and fuel from Churchill to the Baker Lake storage facility. From Baker Lake, trucks would then bring the supplies and fuel to the Kiggavik site using the proposed winter road or the all-weather road. Chesterfield Inlet would also be investigated as a potential transfer site to possibly replace, or supplement the transfer of supplies at Churchill.

In addition, two possibilities have been proposed for the transportation of the yellowcake from Kiggavik to southern Canada. 1) Direct air transport from Kiggavik to Churchill, or to Points North, Saskatchewan. The yellowcake would then be transported via rail (Churchill) or truck (Points North) to southern Canada. 2) Truck transport to Baker Lake and shipped with returning barges to Churchill. The yellowcake would then be transported via rail to its final destination.

The proposed marine transportation for the project has two primary segments that need to be considered. The first is the marine shipment via ocean-going vessel through Hudson Strait and Hudson Bay to Churchill (or Chesterfield Inlet). The second is marine shipment via tug-barge from Churchill (or Chesterfield Inlet) to Baker Lake.

Facilities: Existing facilities at Churchill (or Chesterfield Inlet); tug – barge fleet; Baker Lake dock and storage facility (see above); and access road from Baker Lake to Kiggavik (see above).

f. Air Transportation

Activities: A 2000 metre airstrip is proposed for the Kiggavik site to facilitate the transportation of employees, perishable goods and potentially yellowcake. The airstrip would have capacity to land Hercules aircraft (or similar) and Boeing 737-200 type planes. Part of the workforce required would be brought in on a 7 to 14 day work schedule from the Kivalliq region communities. Approximately 5 trips per week would be required to fly out the yellowcake containers.

Facilities: Single storey shelter/air terminal; airstrip; all associated navigational aids and infrastructure.

g. Site Haul Road between Kiggavik and Sissons

Activities: An approximately 20 kilometre haul road would be constructed between the Sissons deposit and the Kiggavik site. Ore haulage trucks with a maximum gross weight of 250 tonnes would be used on this road to haul ore from Sissons to the Kiggavik site.

2) Anticipated ecosystemic and socio-economic impacts of the project

The assessment of the potential for ecosystemic and socio-economic impacts caused by the proposed project components and activities in the above section and extending through all the project phases should refer to the environmental and socio-economic factors listed below. The scoping of potential impacts caused by the project components, activities and undertakings to environmental and socio-economic factors shall take into account the appropriate temporal boundaries and spatial boundaries and is expected to draw upon relevant information from scientific sources and traditional knowledge.

- a. Climate** (including climate change) **and Meteorology**
- b. Air Quality**
- c. Noise and Vibration**
- d. Geology**
- e. Hydrology** (including water quantity) **and hydrogeology**
- f. Groundwater and Surface Water Quality**
- g. Terrestrial Environment**, including
 - i) Terrestrial ecology
 - ii) Geomorphology and soils
- h. Permafrost and Ground Stability**
- i. Vegetation**
- j. Freshwater Aquatic Environment**, including
 - i) Aquatic ecology
 - ii) Sediment quality
 - iii) Aquatic biota including fish as defined in the *Fisheries Act*
 - iv) Habitat
- k. Marine Environment**, including
 - i) Marine ecology
 - ii) Marine water and sediment quality
 - iii) Marine biota including fish
- l. Marine Wildlife and Marine Habitat**
- m. Terrestrial Wildlife and Wildlife Habitat**
- n. Birds**, including
 - i) Raptors
 - ii) Migratory birds
 - iii) Seabirds
- o. Socio-Economic Factors**, including
 - i) Population demographics
 - ii) Education and training
 - iii) Livelihood and food security
 - iv) Employment
 - v) Economic development and self-reliance
 - vi) Community infrastructure and public services

- vii) Contracting and business opportunities
- viii) Land use
- ix) Benefits, royalty and taxation
- x) Governance and leadership
- p. Human Health and Well-being** (including worker health and safety)
- q. Non-traditional Land and Resource Use**, including
 - i) Protected areas
 - ii) Visual and aesthetic resources
- r. Cultural, Archaeological and Palaeontological Resources**
- s. Cumulative Effects**, including
 - i) Impacts to caribou, caribou migration and calving grounds, and related socio-economic impacts to Baker Lake and other communities
 - ii) Marine traffic (barges/ships) in the region
- t. Transboundary Effects** (including transportation of yellowcake)

3) Anticipated effects of the environment on the project

The scope of the assessment will include the potential anticipated effects of the arctic environment on the project throughout the project's life. The scope of factors will include:

- a. Climate** (including climate change) **and Meteorology**
- b. Permafrost**
- c. Unstable slopes**
- d. Ice scour**
- e. Subsidence**
- f. Flooding**
- g. Extreme weather events**
- h. Seismic activity**

4) Steps which the proponent proposes to take including any contingency plans, to avoid and mitigate adverse impacts

The scope of the assessment will include any contingency plans to avoid and mitigate adverse impacts caused by the proposed project components and activities and these plans should extend through all the project phases. The contingency plans shall take into account the appropriate temporal boundaries and spatial boundaries and is expected to draw upon relevant information from scientific sources and traditional knowledge.

- a. Risk Management**, including
 - i) Emergency response
 - ii) Hazardous materials management
 - iii) Accidents and malfunctions,
 - iv) Regulations
 - v) Mitigation measures

5) Steps which the proponent proposes to take to optimize benefits of the project, with specific consideration being given to expressed community and regional preferences as to benefits

The scope of the assessment will include steps which the proponent proposes to take to optimize benefits of the project, including but not limited to:

- a. **Compensation and Benefits**
- b. **Health Benefits**
- c. **Human Health and Well-being** (including worker health and safety)
- d. **Employment**
- e. **Education and Training**
- f. **Land Use**
- g. **Contracting and Business Opportunities**
- h. **Any pertinent details from the Inuit Impact Benefits Agreement**

6) **Steps which the proponent proposes to take to compensate interests adversely affected by the project**

The scope of the assessment will include the steps which the proponent proposes to take to compensate interest adversely affected by the project including pertinent details from the Inuit Impact Benefits Agreement negotiations.

7) **The monitoring program the proponent proposes to establish with respect to ecosystemic and socio-economic impacts**

The scope of the assessment will include the monitoring programs that will be established to mitigate the potential for ecosystemic and socio-economic impacts caused by the proposed project components and activities. The scope of factors will include:

- a. **Monitoring Programs** (environmental and socio-economic components)
- b. **Post-Project Analysis (PPA)**

8) **The interests in lands and waters which the proponent has secured or seeks to secure**

The scope of the development under review will include any interests in lands and waters which the proponent has secured or seeks to secure based on the proposed physical works and activities or undertakings that constitute the Kiggavik project proposal.

- a. **Nunavut Planning Commission** Conformity Determination under the Keewatin Regional Land Use Plan
- b. **Nunavut Impact Review Board** Project Certificate
- c. **Nunavut Water Board** Type 'A' Water Licence
- d. **Indian and Northern Affairs Canada** Class 'A' Land Use Permit
- e. **Kivalliq Inuit Association** Production Licence
- f. **Canadian Nuclear Safety Commission** Licence to Prepare and Construct a Uranium Mine and Mill
- g. **Canadian Nuclear Safety Commission** Licence to Operate
- h. **Canadian Nuclear Safety Commission** Licence to Decommission
- i. **Canadian Nuclear Safety Commission** Licence to Abandon (i.e. release from CNSC licence)
- j. **Fisheries and Oceans Canada** Fisheries Authorization
- k. **Transport Canada** Navigable Water Permit

9) Options for implementing the proposal

The scope of the assessment will include **Project Alternatives** (such as alternatives to individual components/activities, alternate timing and development options).

10) Any other relevant matters

The scope of the assessment will include any other matters that the NIRB considers relevant, including:

- a. Technological innovations previously untested in the Arctic** including new technology for mine design, and operation and tailings containment
- b. Uranium and Uranium Mining** (including uranium legacy and lack of available information on uranium and the need for training)
- c. Traditional Knowledge**
- d. Statement of Consultation Principles and Practices**
- e. Significant Effects Analysis**
- f. Sustainability Analysis**