Gunnar Mine Rehabilitation Project

Open House

We're here for your input and feedback!

Grab a cup of coffee or a refreshment and let's talk about your thoughts, concerns, and opinions.

Please feel free to talk directly to any of the staff members, or fill out and leave a comment sheet.

Everyone is welcome to attend.
Please sign in!

Hosted by the Saskatchewan Research Council (SRC) and AECOM.

Why are you here and how can you contribute?

Public consultation and community engagement program is an essential component of the development of the closure and clean-up plan.

We want your input:

- Gain input on closure and clean-up ideas
- Help define project objectives
- Understand more about the site, including community use of the area

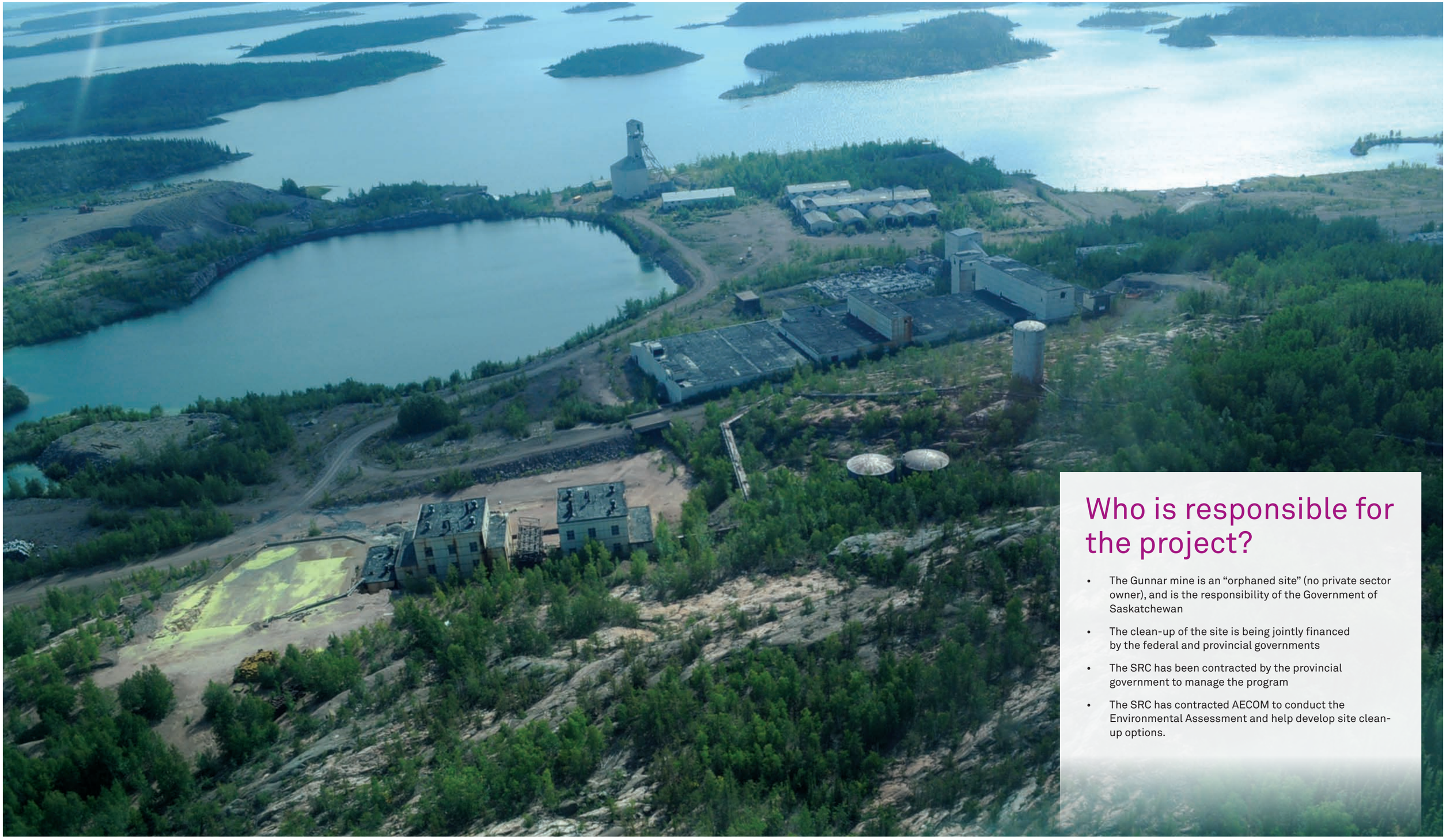
AECOM

CLEANS

SRC
smart science solutions

What is the Gunnar Remediation Project?

- The Gunnar Mine and Mill was closed in 1964 with very little clean-up – the pit was flooded, shaft covered with concrete, and mine site abandoned.
- There are a number of safety and environmental issues that need to be addressed.
- Project goal is to reduce the potential for public health and safety issues and reduce risk to the environment.
- The SRC and AECOM are developing a clean-up and closure plan, which must be accepted by government regulators and local communities prior to implementation.



Who is responsible for the project?

- The Gunnar mine is an “orphaned site” (no private sector owner), and is the responsibility of the Government of Saskatchewan
- The clean-up of the site is being jointly financed by the federal and provincial governments
- The SRC has been contracted by the provincial government to manage the program
- The SRC has contracted AECOM to conduct the Environmental Assessment and help develop site clean-up options.

Gunnar Mine Site Industrial History

Mining History

- The former Gunnar uranium mine operated from 1953 to 1964
- A total of 8.3 million tons of rock were mined
- Initially started as open pit mine
- A 600 m deep vertical shaft was sunk
- Underground mining started in 1957
- Underground operations were connected to open pit through large hole in side of pit wall

Post-Mining History

- Site abandoned, materials taken from site
- Commercial fish plant operated at site
- Recognized as a contaminated site
- Many environmental studies have been conducted at the site

Environmental Assessment (EA)

- EA is required by both the federal government and the province of Saskatchewan
- EA is a planning tool that will help determine the preferred clean-up option
- Must be completed and accepted by the government before site clean-up can occur
- Guidelines have been developed, with public input, for the project. These guide the EA process and the development of the environmental impact statement (EIS)

Components of the EA

Humans	human health and socio-economic studies
Physical	gamma radiation, radon gas
Land	soils, vegetation, wildlife
Air	wind-blown tailings, dust
Water	fish, surface water, and groundwater
TK	Traditional Knowledge
TLU	Traditional Land Use

Project Schedule

2009	2010				2011		2012		2013	2014-2015	2016	Beyond 2016
	Mar	May		Oct/Nov	Mar/Apr				Summer			

- Field programs/ options work
- Options workshop
- Open houses
- Open houses
- SRC submits EIS to government
- SRC submits revised EIS to government
- Ongoing consultation
- Anticipated EIS approval
- Estimated start of clean-up activities onsite
- Estimated completion of clean-up activities
- Ongoing monitoring and adaptive management

Field reports → Write draft EIS → Government review/comment → Government reporting & public review → Regulatory Approvals & Procurement → Onsite clean-up activities → Monitoring and adaptive management

Traditional Knowledge

- Traditional Knowledge/Traditional Land Use (TK/TLU) program is currently being conducted.

  The program seeks to understand the TK/TLU of the Athabasca Denesuline, Métis and local non-Aboriginal residents, as it relates to the Gunnar mine and the clean-up project.

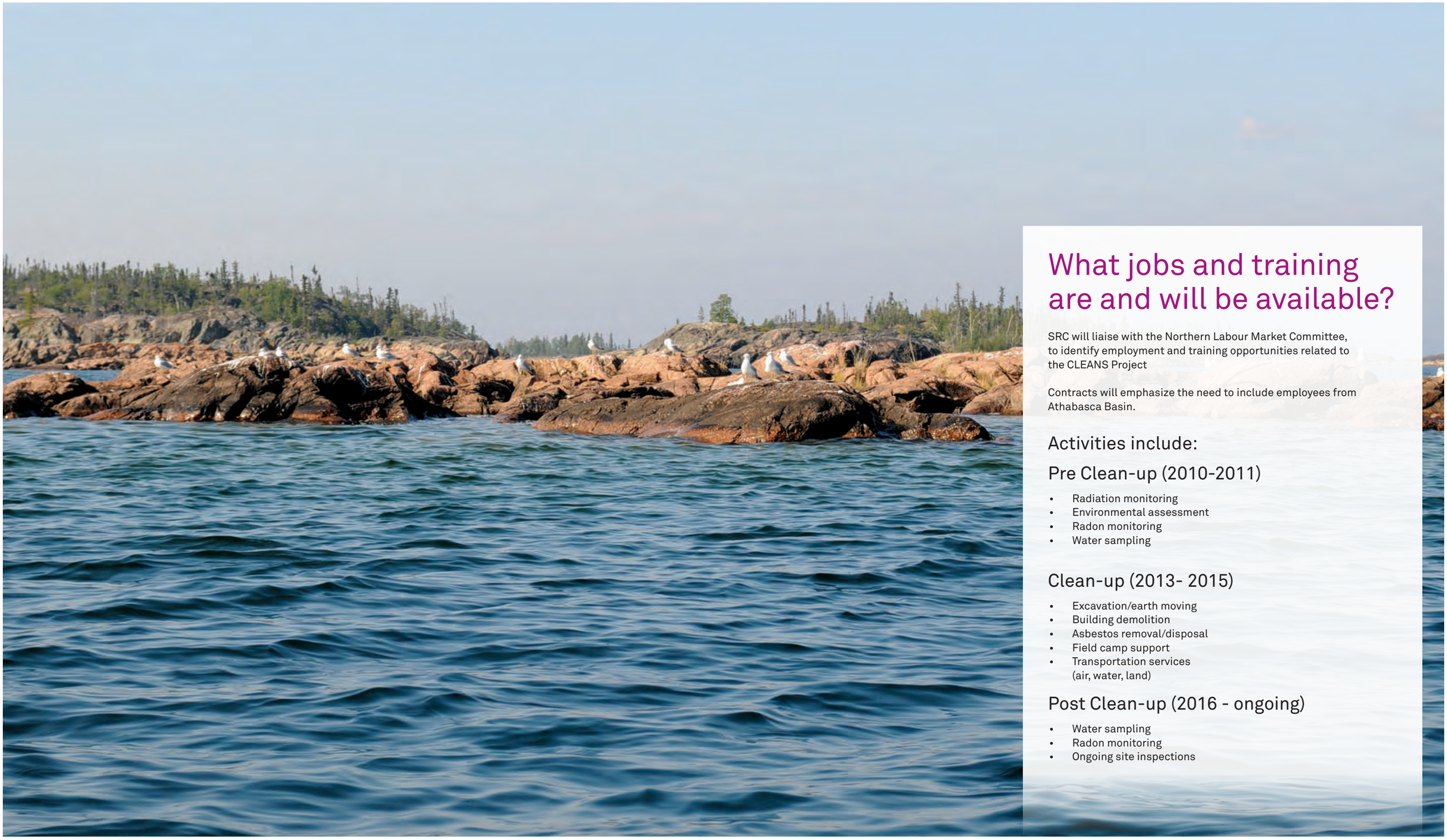
- The regional Athabasca Lands Office through the Prince Albert Grand Council (PAGC) is responsible for completing the TK/TLU program.

- Community meetings were held in early May to explain the project, seek input on, and confirm the TK/TLU approach and methods.

Socio-economics

- Socio-economic studies are also being conducted, to help determine the positive and adverse effects of the project on people and community well-being.

- Information will be collected through phone interviews, existing information, and through project consultation events.



What jobs and training are and will be available?

SRC will liaise with the Northern Labour Market Committee, to identify employment and training opportunities related to the CLEANS Project

Contracts will emphasize the need to include employees from Athabasca Basin.

Activities include:

Pre Clean-up (2010-2011)

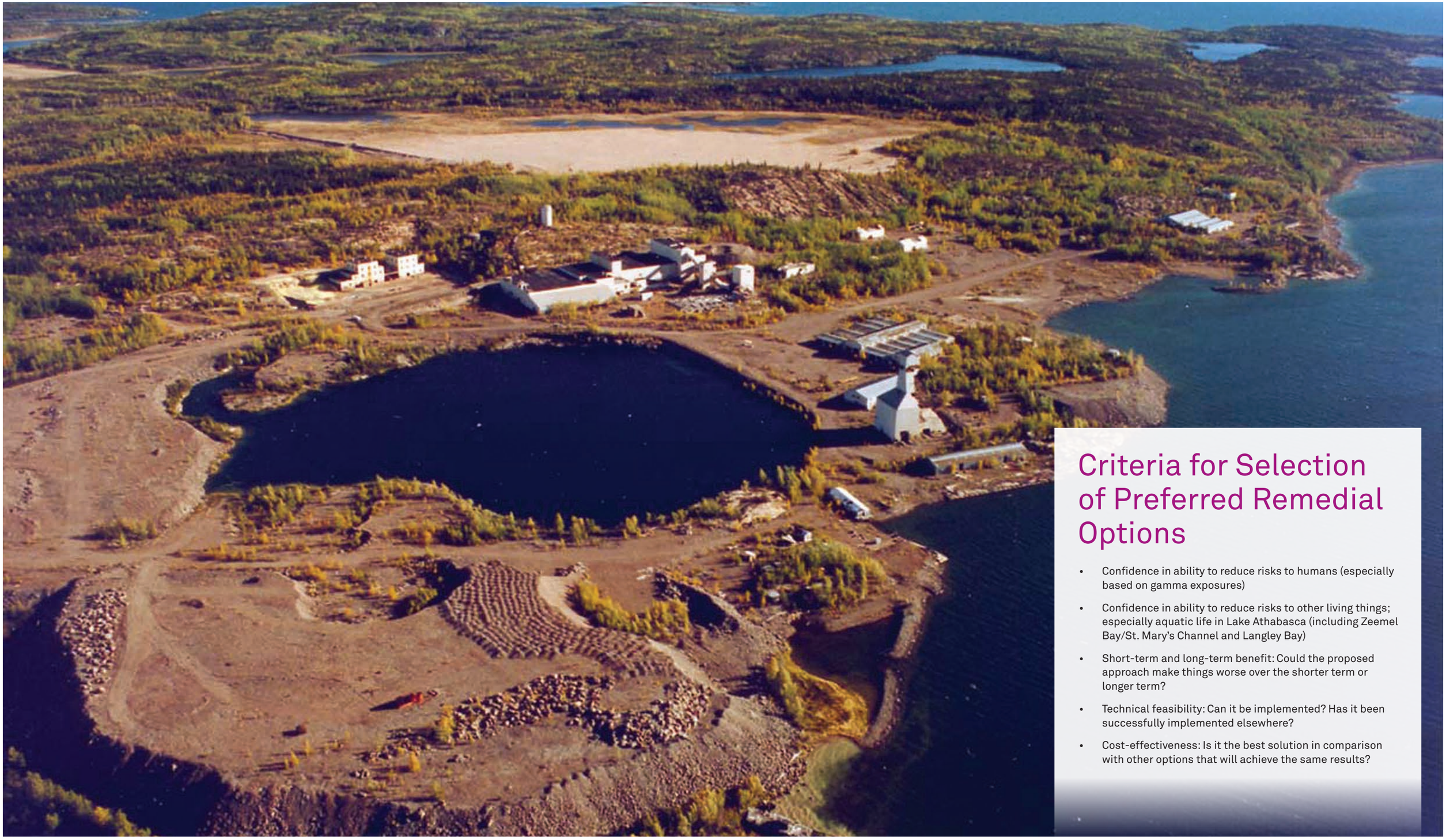
- Radiation monitoring
- Environmental assessment
- Radon monitoring
- Water sampling

Clean-up (2013- 2015)

- Excavation/earth moving
- Building demolition
- Asbestos removal/disposal
- Field camp support
- Transportation services (air, water, land)

Post Clean-up (2016 - ongoing)

- Water sampling
- Radon monitoring
- Ongoing site inspections



Criteria for Selection of Preferred Remedial Options

- Confidence in ability to reduce risks to humans (especially based on gamma exposures)
- Confidence in ability to reduce risks to other living things; especially aquatic life in Lake Athabasca (including Zeemel Bay/St. Mary's Channel and Langley Bay)
- Short-term and long-term benefit: Could the proposed approach make things worse over the shorter term or longer term?
- Technical feasibility: Can it be implemented? Has it been successfully implemented elsewhere?
- Cost-effectiveness: Is it the best solution in comparison with other options that will achieve the same results?

The Mine Pit

Clean-up Options

Leave as water body

Preferred option

- Could be part of water management program, will require public safety features

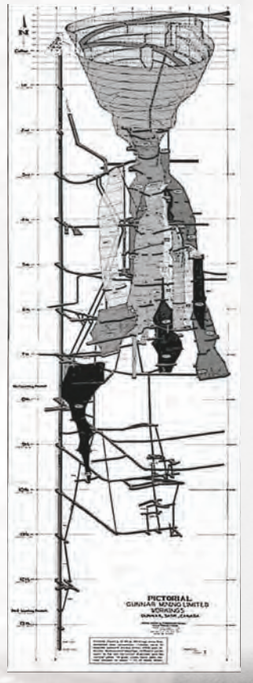
Use as disposal site for tailings, demolition materials, and/or waste rock

Alternate option

- Moving tailings is a challenge, space in pit will not hold all tailings
- Waste rock can be managed without moving, but space is available in pit.
  Pit would require partial drainage, and water treatment

Technical challenges

- Water is contaminated in pit
- Pit not classified as “fish habitat” by Fisheries and Oceans Canada
- Large hole in wall of pit to underground mine, little is known about this



Buildings and Structures

Clean-up Options

Place materials in engineered landfill on waste rock

Preferred option

- Combines secure cover needs for landfill and waste rock
- Engineered cover required
- Hazardous materials to be transported off-site to appropriate facility except for asbestos, which is safe to wrap and bury on-site

Place materials in one to three new engineered landfills at mill site area

Alternate option

- Any drainage would go into flooded pit
- Engineered landfill would cover part of the mill complex/acid plant footprint
- Engineered cover required
- Hazardous materials to be transported off-site to appropriate facility except for asbestos, which is safe to wrap and bury on site

Technical challenges

- Special precautions and training required for demolition based on physical occupational hazards and hazardous materials management
- Site is remote. Mobilization of equipment by barge or winter road
- Some mill site road base and foundations were built on minimally contaminated (gamma radiation) waste rock

Waste Rock Pile

Clean-up Options

Leave in place

Preferred option

- Must be covered with clean material to control human health risks from gamma radiation
- Very steep banks should be cut back to reduce fall hazards
- Seeps from base of pile to be managed

Reuse as cover material

Alternate option

- Not feasible for much of the pile as gamma radiation levels too high
- Some of pile might have low gamma levels, and might be used (less expensive source of material)
- Waste rock of different gamma levels would need to be segregated, expensive to handle
- Other domestic and industrial wastes (debris)apparently disposed along with waste rock

Technical challenges

- Gamma radiation management
- Very steep edges and banks
- Large amount of material to deal with
- No information on composition of waste rock pile beneath its surface
- Not known how contaminated the pile is (with gamma) beneath the top layer

Tailings

Clean-up Options

Cover in place

Preferred option

- Cover to reduce human gamma exposure potential (to < 1 µSv/h)
- Cover to also reduce amount of rainfall or snowmelt that moves through the tailings
- Re-configure to better manage surface flows and keep new runoff clean
- Facilitate re-vegetation if required to either reduce water infiltration or maintain long-term cover stability

Move partially to pit

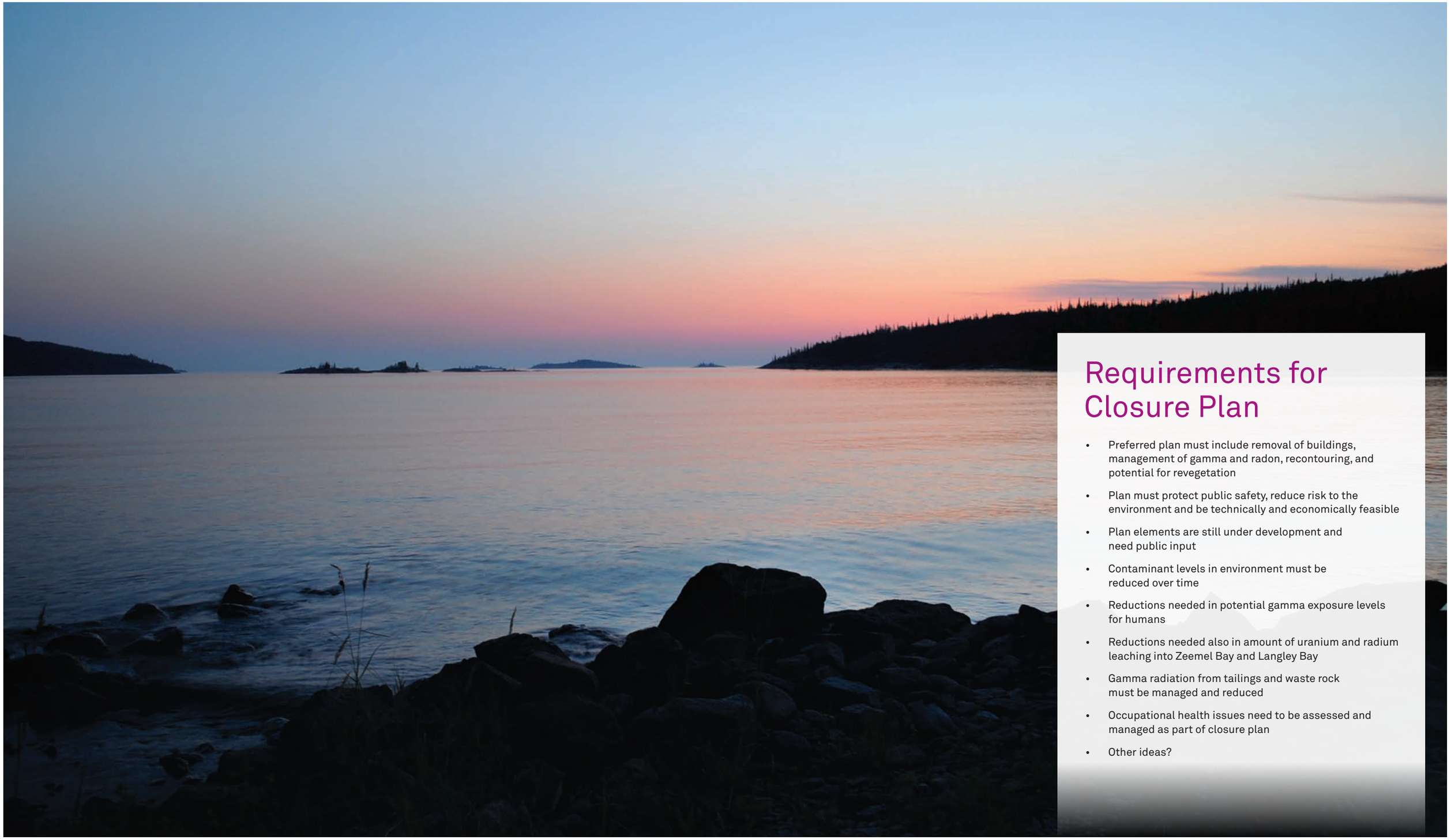
Alternate option

- Re-locate volume of tailings from Gunnar Main that can be accommodated in pit
- Cover remaining, as above. Likely to be the same footprint for cover
- Massive disturbance of tailings may result in rapid, short term mobilization of contaminants to watershed and Langley Bay
- Possible additional exposure to workers during relocation of tailings to the pit

... Tailings Continued

Technical challenges

- Gamma radiation management
- Ponded water on surface of tailings is contaminated (especially Gunnar Main)
- ‘Porewater’ contained within the tailings body is highly contaminated with soluble forms of uranium, radium, sulfate
- Parts of Gunnar Main deposit are prone to wind-erosion and duning. Dry nature of tailings, instability, and high sulfate salt concentrations inhibit revegetation.
- No current road access to Gunnar Central or Langley Bay deposits
- Added challenge in Langley Bay deposit of stabilizing tailings along beach front against wave and ice erosion



Requirements for Closure Plan

- Preferred plan must include removal of buildings, management of gamma and radon, recontouring, and potential for revegetation
- Plan must protect public safety, reduce risk to the environment and be technically and economically feasible
- Plan elements are still under development and need public input
- Contaminant levels in environment must be reduced over time
- Reductions needed in potential gamma exposure levels for humans
- Reductions needed also in amount of uranium and radium leaching into Zeemel Bay and Langley Bay
- Gamma radiation from tailings and waste rock must be managed and reduced
- Occupational health issues need to be assessed and managed as part of closure plan
- Other ideas?

Next Steps

- Incorporate ideas and comments from public
- Interviews for TK and socio-economic programs in summer 2010
- Determine environmental effects of preferred closure plan
- Hold further public meetings in fall 2010
- Submit EIS to government agencies in December 2010
- Additional consultations and review of EIS in 2011
- Please leave your comments!