Saskatchewan Research Council

Gunnar Mine Site Closure Options

Presented at

Uranium City Sept 1, 2010

Process

- Environmental assessment for project
- EA includes a description of what is the preferred closure plan
- Many options brought down to a final three
- Present the options, get input and refine options as needed
- Answer questions

Project Purpose

The purpose of the rehabilitation project is to reduce risk to the health and safety of the public associated with the site and to reduce the environmental risk associated with the mine site, the mine pit, the waste rock piles and the tailings management areas.

Project Objectives

- The project should:
- ✓ contain and stabilize tailings and waste rock piles to minimize human health risks posed by radon emissions from the tailings waste management areas
- ✓ contour; cover and establish vegetation on the waste rock piles;
- ✓ reduce and or treat seepage from tailings to reduce impacts on local lakes
- ✓ remove and destroy mine structures and workings, mill facilities, administration housing infrastructure as well as laboratories and other workings at the Gunnar uranium mine facility
- ✓ reclaim and landscape the site in a manner compatible with the natural surroundings and future use at the sites
- ✓ Address conventional health and safety issues at site.

Remedial/Rehabilitation Objectives

- The following objectives have been developed for the rehabilitation project. They have been divided into short term and long term objectives for clarity.
- A successful rehabilitation plan for this project would meet or exceed these objectives.

Short Term Objectives

- Short Term
- Gamma Levels at surface are reduced to1.0 uSv/h at 1 m height above ground (i.e., the gamma levels following rehabilitation should not exceed 1.0 uSv/h, when averaged over an area of 100 m x 100 m, or 1 ha).
- Public safety issues are managed and the risks to the public are reduced to acceptable levels.
- All hazardous materials on site are removed from site or managed in accordance with existing provincial and federal guidance within the licensed facility.

Short term objectives cont.

- Occupational risks associated with the implementation of the rehabilitation are acceptable to Provincial and federal regulators.
- Environmental risks at the site have been considered and the negative effects of rehabilitation activities are considered insignificant.
- Monitoring of the site has been accepted by regulatory authorities.
- The Site rehabilitation activities are technically effective.
- The Site rehabilitation activities are economically feasible.

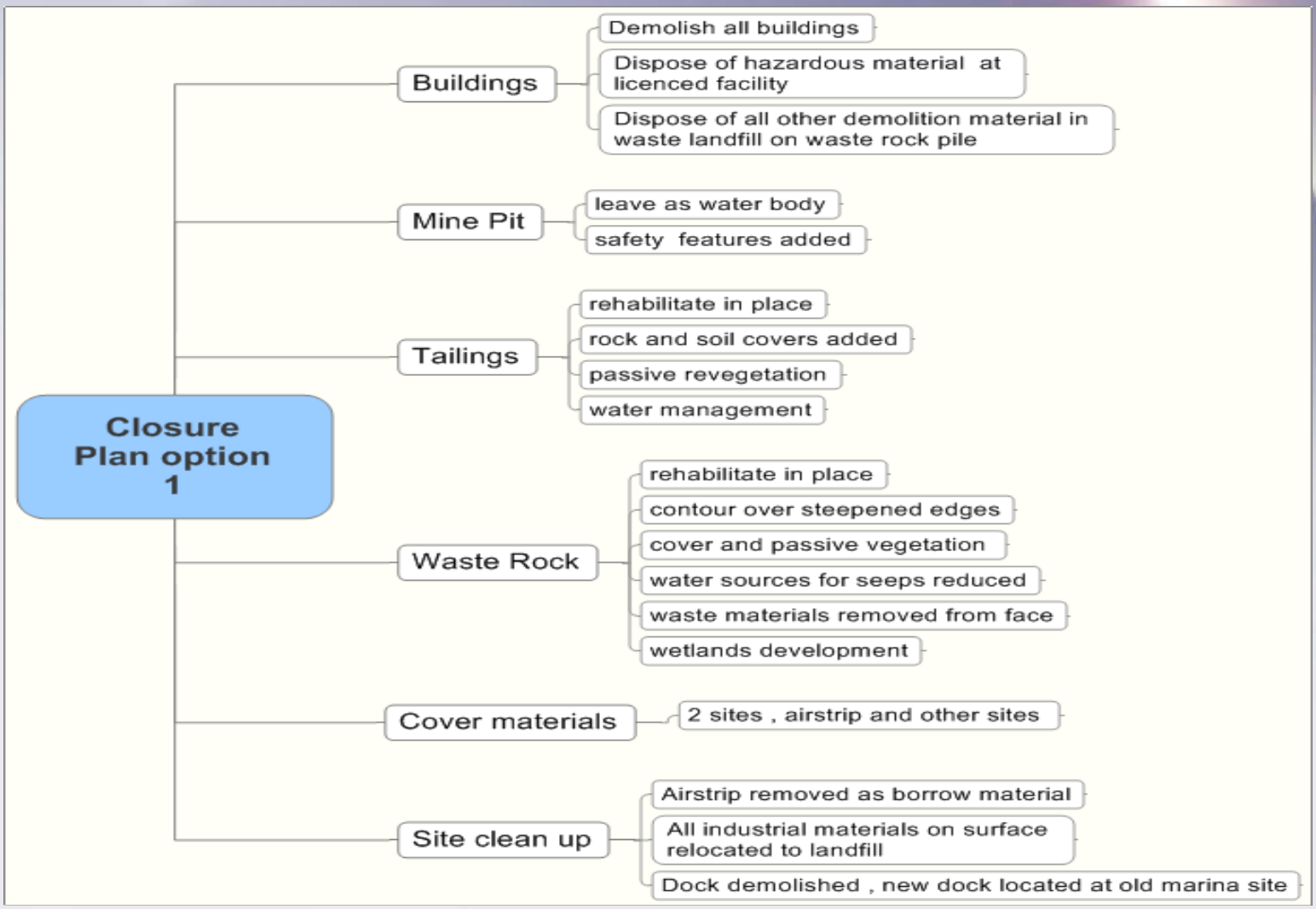
Long Term Objectives

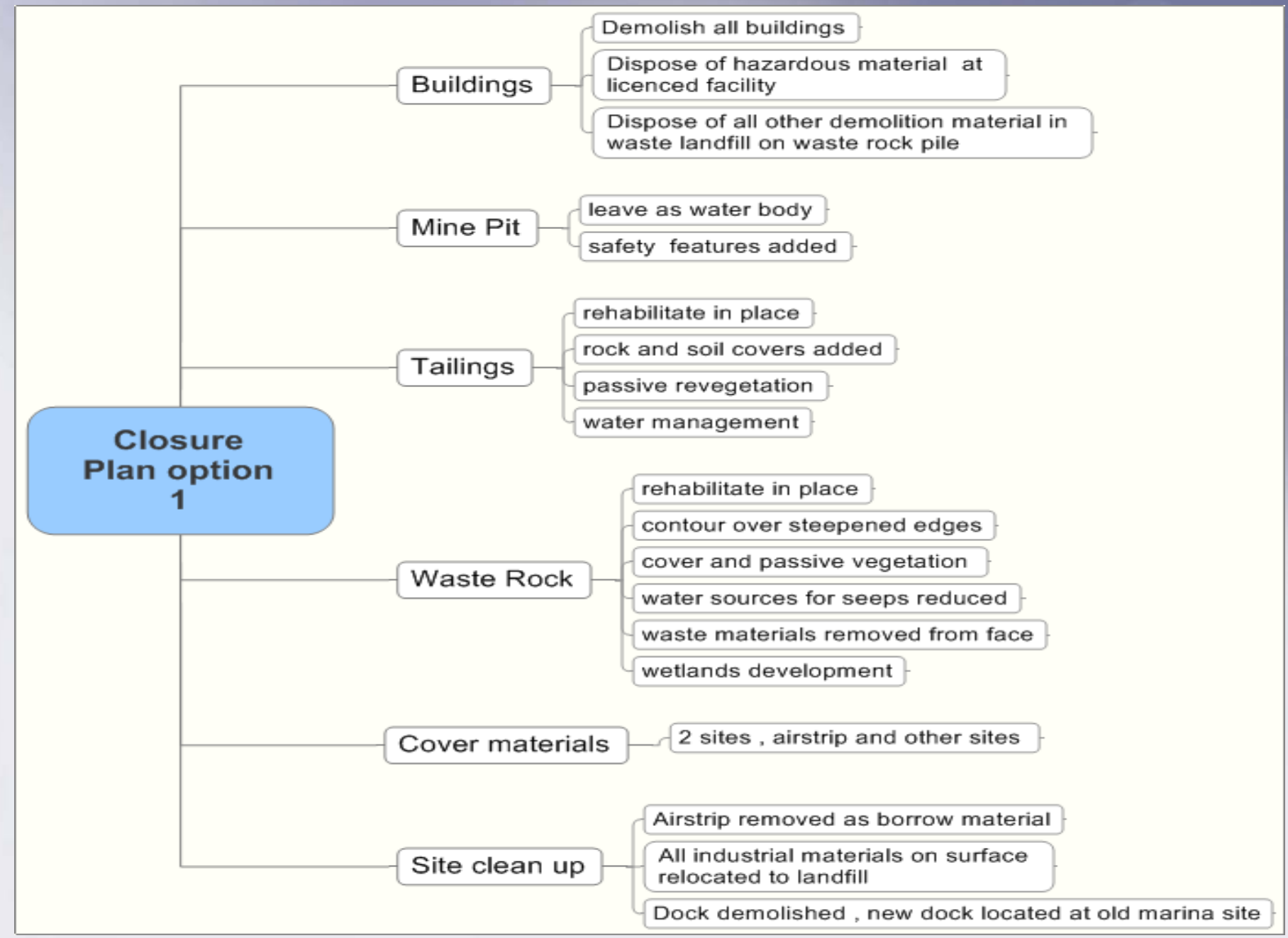
- Long Term
  - Water quality is improved at source discharges
  - Concentrations of Contaminants of Concern measured in important VECs have been significantly reduced from pre rehabilitation conditions or meet criterion accepted at the site by regulatory agencies
  - Revegetation of the site is successful
  - All buildings and structures at the site have been demolished and placed in an engineered landfill on site

Long Term Objectives cont.

- Monitoring results of the site have been provided to and are accepted to regulatory authorities
- The site rehabilitation activities are technically effective and any needed repairs or augmentations have taken place.
- The site rehabilitation activities, including site monitoring and maintenance are considered and remain economically feasible.

Option 1


Closure Plan option 1
Buildings
Demolish all buildings
Dispose of hazardous material at licenced facility
Dispose of all other demolition material in waste landfill on waste rock pile
Mine Pit
leave as water body
safety features added
Tailings
rehabilitate in place
rock and soil covers added
passive revegetation
water management
Waste Rock
rehabilitate in place
contour over steepened edges
cover and passive vegetation
water sources for seeps reduced
waste materials removed from face
wetlands development
Cover materials
2 sites , airstrip and other sites
Site clean up
Airstrip removed as borrow material
All industrial materials on surface relocated to landfill
Dock demolished , new dock located at old marina site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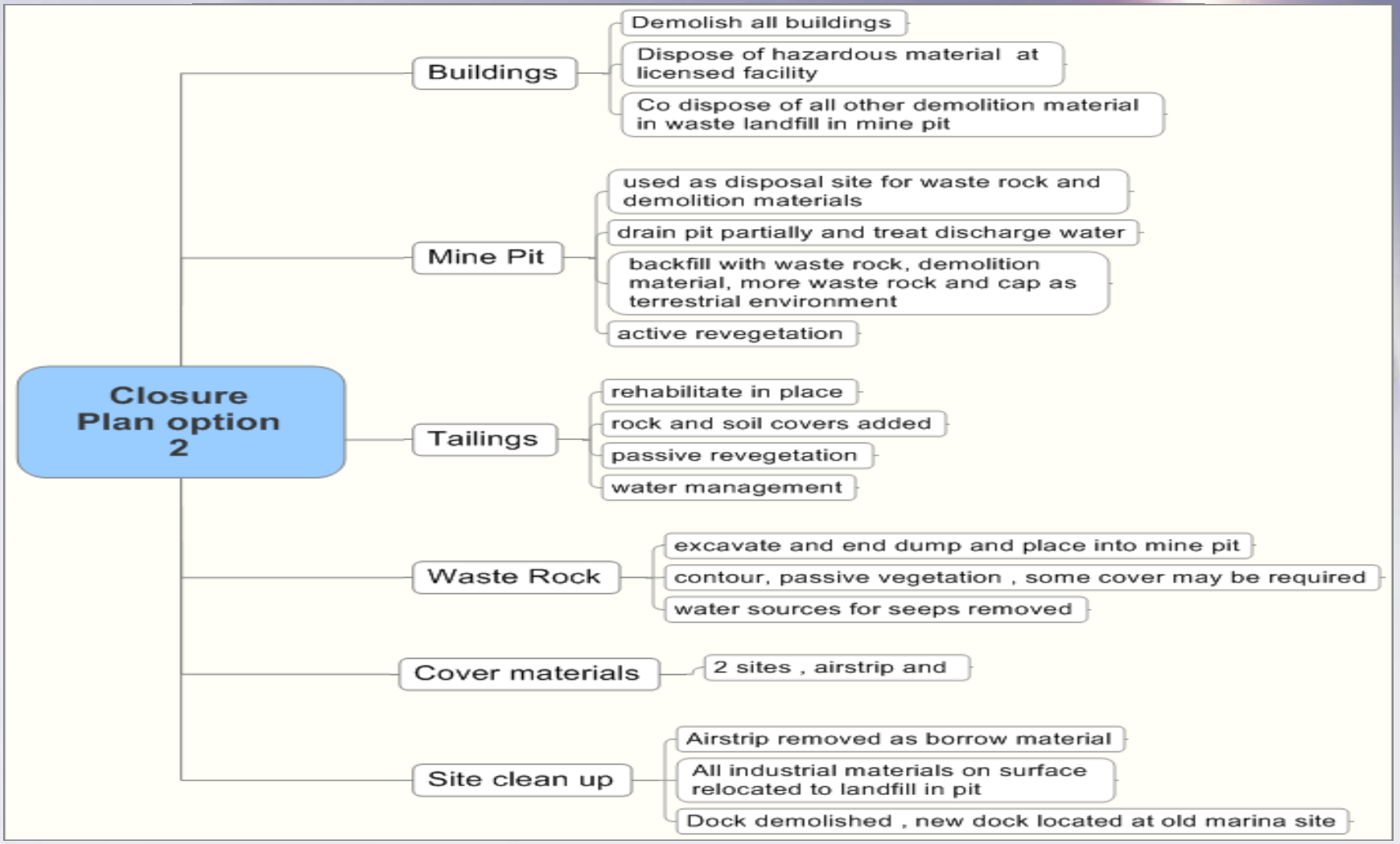
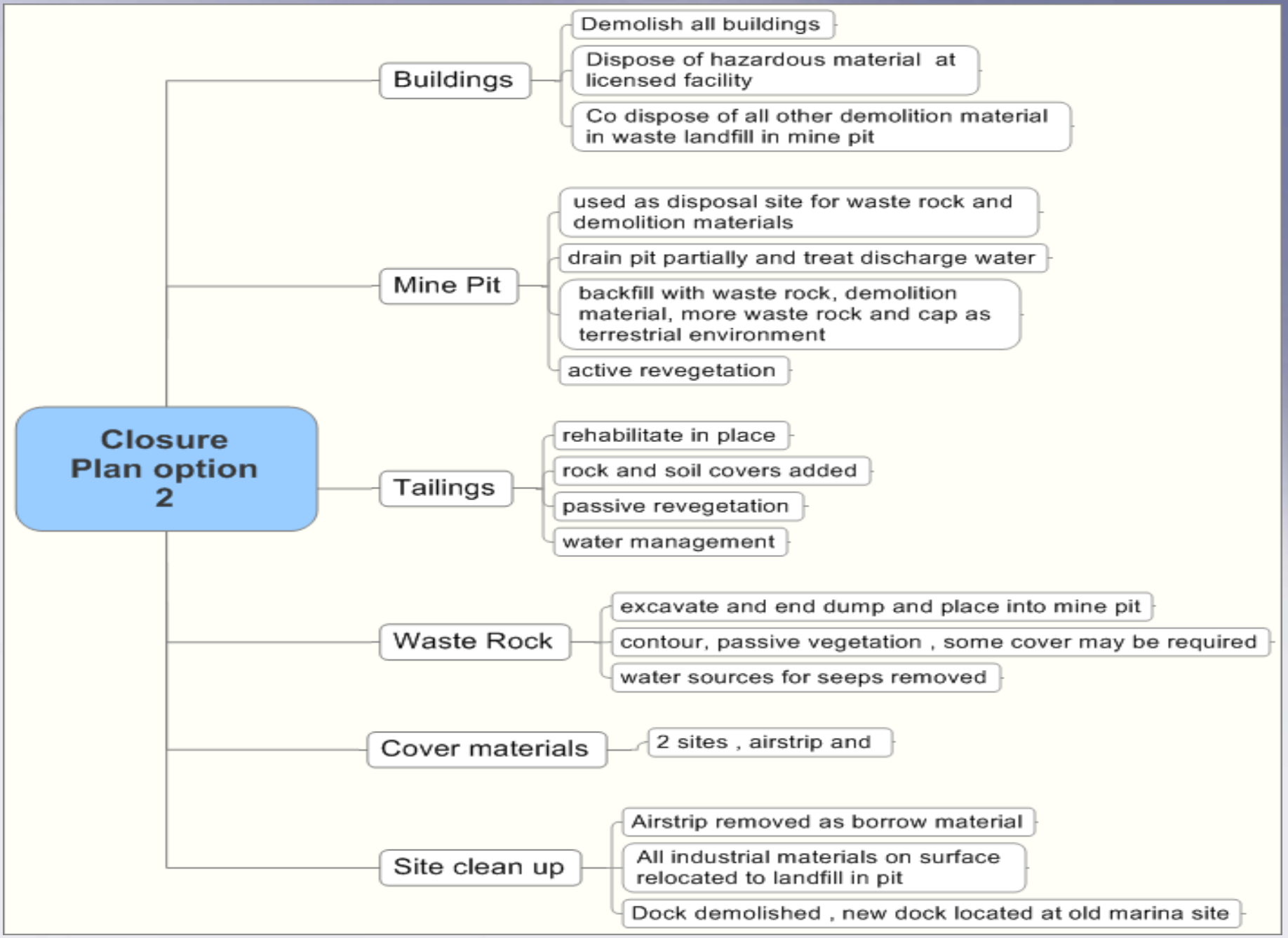
Option 2


Closure Plan option 2
Buildings
Demolish all buildings
Dispose of hazardous material at licensed facility
Co dispose of all other demolition material in waste landfill in mine pit
Mine Pit
used as disposal site for waste rock and demolition materials
drain pit partially and treat discharge water
backfill with waste rock, demolition material, more waste rock and cap as terrestrial environment
active revegetation
Tailings
rehabilitate in place
rock and soil covers added
passive revegetation
water management
Waste Rock
excavate and end dump and place into mine pit
contour, passive vegetation , some cover may be required
water sources for seeps removed
Cover materials
2 sites , airstrip and
Site clean up
Airstrip removed as borrow material
All industrial materials on surface relocated to landfill in pit
Dock demolished , new dock located at old marina site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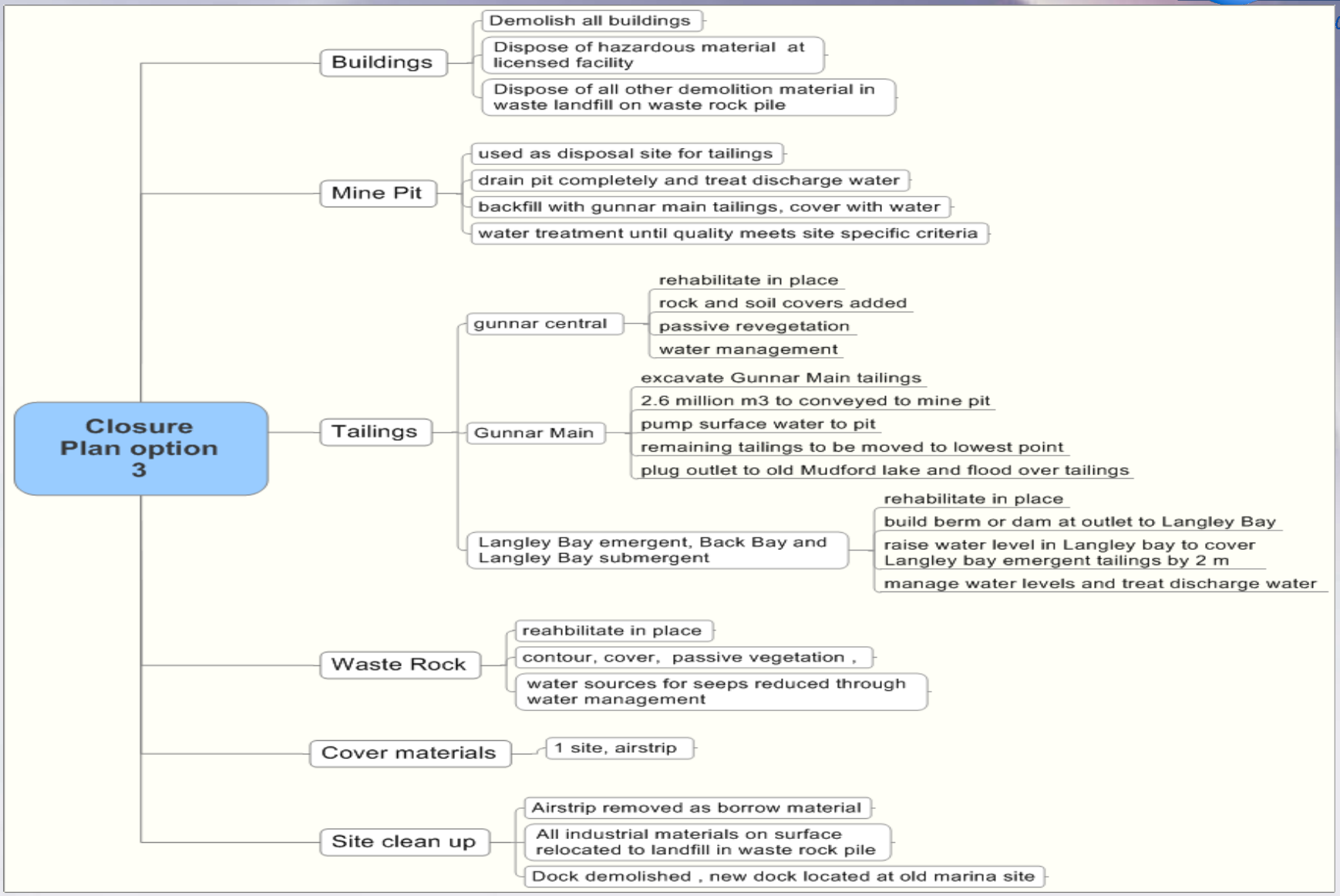
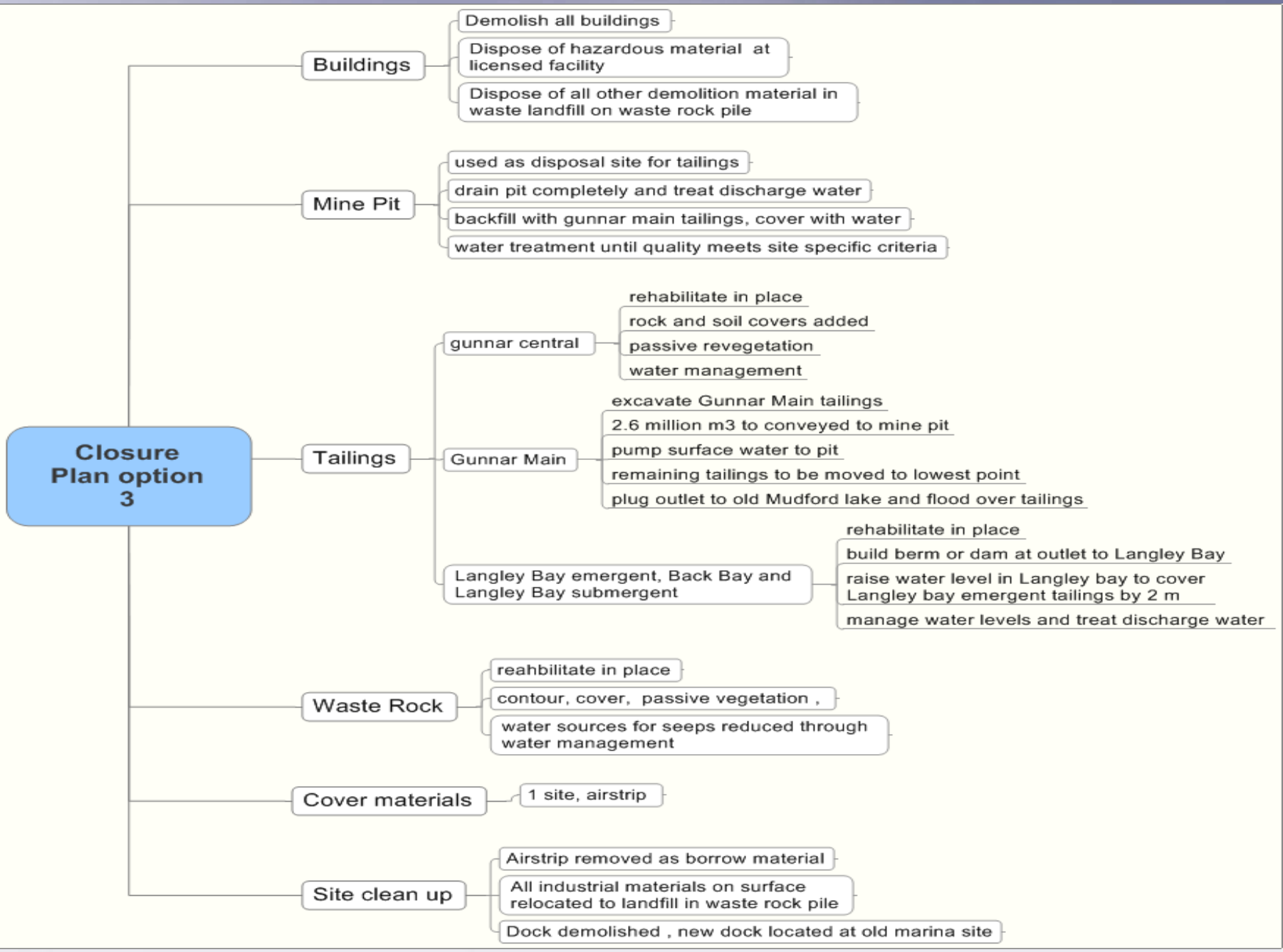
Option 3


Closure Plan option 3
Buildings
Demolish all buildings
Dispose of hazardous material at licensed facility
Dispose of all other demolition material in waste landfill on waste rock pile
Mine Pit
used as disposal site for tailings
drain pit completely and treat discharge water
backfill with gunnar main tailings, cover with water
water treatment until quality meets site specific criteria
Tailings
gunnar central
rehabilitate in place
rock and soil covers added
passive revegetation
water management
Gunnar Main
excavate Gunnar Main tailings
2.6 million m3 to conveyed to mine pit
pump surface water to pit
remaining tailings to be moved to lowest point
plug outlet to old Mudford lake and flood over tailings
Langley Bay emergent, Back Bay and Langley Bay submergent
rehabilitate in place
build berm or dam at outlet to Langley Bay
raise water level in Langley bay to cover Langley bay emergent tailings by 2 m
manage water levels and treat discharge water
Waste Rock
reahbilitate in place
contour, cover, passive vegetation ,
water sources for seeps reduced through water management
Cover materials
1 site, airstrip
Site clean up
Airstrip removed as borrow material
All industrial materials on surface relocated to landfill in waste rock pile
Dock demolished , new dock located at old marina site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Review and Questions

- Preference for Option 1
- Some issues still to be resolved on all options
- Look at
  - Environment
  - Public safety
  - Occupational Health and Safety
  - Technical
  - Cost
  - Potential environmental effects of the project on the environment