



*Spring 2015*

# Underground Stabilization Update

## Background

At Giant Mine, some underground site infrastructure is more than 60 years old.

The Project Team has identified underground areas that require immediate action to reduce risks to on-site staff, the public and the environment. This is part of our ongoing risk management process.

In 2012, risks of underground failure that could lead to mine flooding or a release of arsenic trioxide were assessed as unacceptable. In order to reduce risks at the Giant Mine site, underground stabilization work was required.

### *Addressing underground risks*

As part of ongoing risk management at the site, the Project Team has identified underground areas that require immediate action to reduce risks to on-site staff, the public and the environment.

A key concern associated with the underground stability is that the ground could collapse. A collapse might result in either a release of arsenic trioxide dust, flooding of the underground mine workings or both.

Stabilization work completed to date has reduced these risks. The Project Team and its contractors continue work to further reduce risks at site.

## What was done



*Geotechnical drilling*

Stabilization work started in 2013. The activities completed were important to reduce the risk of mine flooding. In 2014, the following work was also completed:

- geotechnical drilling was done to confirm stope volumes and shape. It also set holes that will provide delivery points for paste backfilling later in the 2015 season.



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- a pilot paste production plant was built onsite to determine the best mix and strength for full paste production that is going forward in the 2015 season.
- approximately 35,000 m<sup>3</sup> of tailings were dug out and stockpiled to make paste for summer 2015, and the excavated areas were restored and graded to maintain drainage over the winter.
- an ice cap was created on top of the stockpiled tailings for dust management during spring thaw.

Paste is created by mixing mine tailings with water and cement. This mixture will be pumped underground, where it hardens and fills the void inside the stope to stabilize the mine structure.

Stopes are large underground spaces created during the mining process.

*After two seasons of underground stabilization work, risks associated with B1-18 stope have been reduced by 90 per cent. Portions of B1-18 Stope are directly under Baker Creek. Before this work was completed, there was an unacceptable risk of Baker Creek flooding the mine through this stope.*

## Ensuring safety of on-site workers

On-site worker safety is always a priority at the Giant Mine site. Workers involved with the excavation and processing of the tailings performed work utilizing the proper Personal Protective Equipment (PPE). Standard PPE includes a hard hat, boots, high visibility vest, safety glasses. When required, Tyvek suits and half-mask respirators were also used depending on the task.

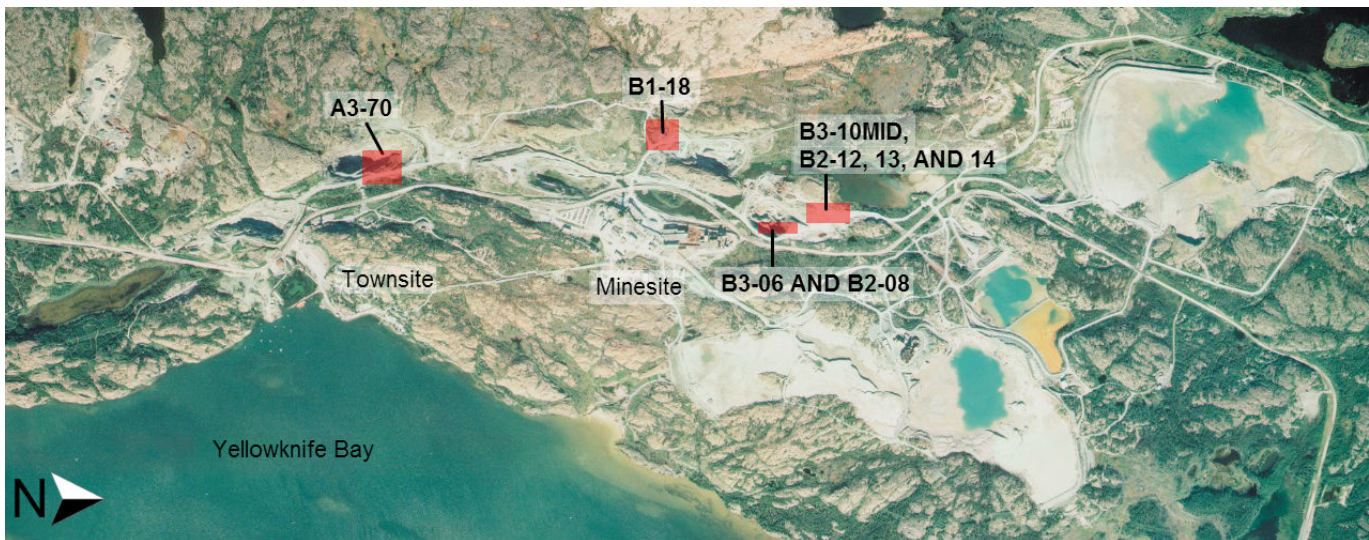
## Protecting the local environment

In addition to site-specific air monitoring for all underground stabilization work, air monitoring stations were also placed to assess site-wide air quality. These measures continue to ensure that the underground stabilization work has no impact on communities. (See *Air Quality Monitoring Network update for more details*).



*Tailings were stockpiled to make paste for 2015.*

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## Local firms involved

Yellowknives Dene joint venture Det'on Cho Nahanni Construction Ltd. won the \$11.6 million contract for Interim Underground Stabilization in August 2014 through a competitive process. Under this two-year contract, the company will excavate, relocate and process tailings into a paste, and pump the paste underground in several locations across the site.

## What's next

In 2015, approximately 45,000 m<sup>3</sup> of paste will be produced and delivered to six stope areas. These areas include

- non-arsenic stopes A3-70, B3-06, B3-10mid and B1-18, and
- arsenic stopes B2-08, and B2-12 to -14

## Immediate risk mitigation

In addition, the Project Team will be addressing risks associated with the stability of the C1 Pit.

Though the western wall of this pit has always been a concern for the project's geotechnical engineers in terms of water from Baker Creek seeping into the pit, concerns increased more recently as changes were observed that now mean the top of the wall has the potential to fail in the event of a large flood of Baker Creek. This led the Project Team to investigate the stability of that wall further through a drilling program which determined that a failure was possible under certain conditions.

If that pit wall collapsed, water from Baker Creek could enter the mine and cause a flood.



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The plan is to address this risk by stabilizing the wall using a buttress – a support structure made of various sized rock – that will be built against the western edge of the wall. This is a common and well-accepted approach to managing this type of risk.

The design for this project was completed in December 2014 and construction is planned for April to June 2015. The bulk of construction is anticipated to be completed before freshet. An estimated 50,000 cubic metres of various rock fill will be needed to complete construction. The rock fill will come from an onsite quarry.



## *We want to hear from you*

There will be many opportunities to participate in this project in the coming months and years. Engagement will be critical to addressing EA measures, licensing and permitting, as well as project design.

Want to learn more? Here's how:

- Attend community information sessions and stakeholder meetings
- Learn about the project online: [www.giant.gc.ca](http://www.giant.gc.ca)
- Follow us on Twitter @GiantMine
- Talk to us: 867-669-2426
- Come see us: 3rd floor, Gallery Building, 4923 52 Street, Yellowknife

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