Government

Yukon Government

Thaidra Water Management at Faro Mine Complex

Water Movements

• Overview

FMC Environmental Program:

- The Faro Mine Complex (FMC) is one of the largest and most complex contaminated sites in Canada.
- Located in a remote area in the south central Yukon, FMC was an open-pit lead-zinc mine that operated from 1969 until 1995.
- The FMC site covers approximately 2,500 hectares and includes 70 million tons of tailings and 120 million tonnes of waste rock.
- The tailings and waste rock contain high concentrations of heavy metals that are leaching into the environment.
- A Care and Maintenance (C&M) regime, including a care and maintenance (C&M) regime, including collection of tailings surface water and collection of contaminated water, was designed to help maintain physical separation from existing source areas.

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Water treatment system to treat impacted waters:

- stream to initially handle a wide range of influent demands.
- can be expanded over time, if needed.

Manage stormwater (dirty and clear):

- Prior to, during, post-construction, and long-term.
- Various Best Management Practices (BMPs) management will include drainage and collection unit facilities with collection, treatment, and disposal of the water.

Adaptive Management, Long Term Care and Maintenance

1. Keep clean water clean to the extent practicable:
   - Maintain collection system from existing source areas.
   - Intercept the impacted sources before they reach clean water.
   - Reduce the shear zone, away from developing or Faro surface if necessary.
   - Provide water from interference CZ systems.

2. Reduce contaminant loading to the water practicable:
   - Reduce the shear zone, away from developing or Faro surface if necessary.

3. Collect impacted water and other sources of contamination in the area:
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   - Foremost element as required for coordination with adjacent, downstream and upstream areas.

4. Water treatment system to treat impacted waters:
   - Stream to initially handle a wide range of influent demands.
   - Can be expanded over time, if needed.

5. Manage stormwater (dirty and clear):
   - Prior to, during, post-construction, and long-term.
   - Various Best Management Practices (BMPs) management will include drainage and collection unit facilities with collection, treatment, and disposal of the water.

6. Appropriate monitoring is to be planned and required to be both timely.
FMC Environmental Program: Water Management

- Cross Valley Pond, Water Management

FMC Environmental Program: Water Management Information

- Interim Water Treatment Plant
  - Constructed in 2014
  - 4,000 gpm (11,000 m³/day) capacity
  - Operates May to September

- Vangorda Water Treatment Plant
  - Constructed in 1992
  - 2,000 gpm (5,460 m³/day) capacity
  - Operates April to October

FMC Environmental Program: Water Collection & Treatment

- Impact water is collected using pits, seepage intervention systems, pumps, and diversion. Conveyance for treatment is done using piping to one of two treatment plants. Water collection occurs year round, with treatment undertaken from April to October.

- Impact water is managed via the following:
  - 3 water treatment plants on site (one built in 1992, one built in 2014, and one built in 2017), which use lime-based neutralization systems to effectively treat impacted water.
  - 48 pumps rotated through and monitored seasonally; 14 main water management locations throughout the site;
  - 4 interception systems, pumps, and diversions.
  - 3 water treatment plants on site that treat impacted contaminated water.
  - 703,427 kg of lime used to treat 3,929,395 m³ of water (17-06-2018); 850,126 kg of lime used to treat 4,649,620 m³ of water (18-07-2019), with use increasing year on year.
  - 2015 increase over 2016, 19% water treated in 2015 increase over 2016, 14% water released in 2015 increase over 2016.
  - $295,787 for labor, $338,787 for electricity, $1,000,000 for diesel; $1,171,554 for labor, $1,208,948 for electricity, $2,000,000 for diesel.
FMC Environmental Program: Water Collection & Treatment

- Extensive environmental monitoring, sampling, and laboratory chemical analyses carried out year round to assess water quality.
- 2,490 samples analyzed annually onsite in CALA accredited laboratory
- More than 650 confirmatory samples submitted to offsite contract laboratories

Questions?