Twin Metals Minnesota (TMM)

Laurentian Vision Partnership
January 23, 2019
TMM Site Safety

GA-5 Stipulation CoA drill sites and road access:

• “In the interest of safety and to the extent practical, unauthorized personnel shall be discouraged from entering operations areas. The permittee shall discuss options for this with the Authorized Officer and implement the requirements.”

• Site Induction provided to raise awareness and ensure potential hazards are recognized and mitigated ensuring the safety of operators and site visitors

• Emergency Action Plans (EAPs) are posted and included in training and site inductions
Who We Are
Who We Are

• Minnesota company focused on designing, constructing and operating an underground copper, nickel, platinum, palladium, gold and silver mining project in northeast Minnesota

• Wholly owned subsidiary of Antofagasta plc, one of the top 10 global copper producers

• Offices in Ely and St. Paul
TIMELINE - PARADIGM

2006 DM begins Ops

2011 TMM Ely Headquarters

2014 JV PFS

2010 TMM JV formed

2013 Ely CSF Opens

2011 TMM JV formed

2015 TMM wholly owned

3/2016 M-Opinion

3/2016 State Denies Access

12/2016 Gov’t Cancels Leases

12/2016 Mineral Withdrawal

12/2017 M-opinion reversal

6/2018 Cancellation of Federal Mineral Withdrawal

12/2018 TMM Owners PFS

2019 Formal Project Submittal

3/2016 State Denies Access

2017 Nolan Emmer Western Caucus visit

5/2018 Lease reinstatement

TMM Project Updates

1/2019 Lease T&C Comment Period

2018 TMM Project Updates

2019 Formal Project Submittal
Submittal of formal project submittal will trigger state and federal environmental review processes

Federal Triggers
• Mining Federal minerals
• Impacts to Wetlands
• Use of federal surface lands

State Triggers
• Mining of non-ferrous minerals within the state

National Environmental Policy Act (NEPA)

Minnesota Environmental Policy Act (MEPA)

Joint EIS
Comment Period

EA: 1352/1353 Lease Renewal Terms and Conditions
NEVER START A PROJECT UNLESS ALL RESOURCES ARE AVAILABLE
LEASE RENEWALS

• Comment period for Lease Terms and Conditions ended yesterday (1/22/2019)

• Mineral Tenure and Right of Future Renewals must be clearly acknowledged

• EA is sufficient for Lease Renewal, no need for EIS for lease renewal

• Any new Stipulations imposed must be made clear
  • Lease T&C must allow investment to occur
  • Regulatory environment must facilitate investment
FIELDWORK

Hydrogeology
TMM is in the process of conducting baseline studies to support mine design efforts and various State and Federal permitting requirements.

Groundwater and Surface water Hydrogeology

A critical baseline element includes the definition of the hydrological environment (groundwater and surface water hydrology). Studies are currently underway to characterize the groundwater in both the proposed Tailings Storage Facility (TSF) and Underground Mine Area (UMA) including:

- Installation of Monitoring Wells in the immediate TSF and UMA areas
- Installation of monitoring wells in regional positions outside the immediate mine development areas
- Testing and continued monitoring of the Monitoring Well network
HYDRO DRILLING
HYDRO WELL SITE
FIELDWORK

Exploratory boreholes- Borehole Sealing
BOREHOLE SEALING (ABANDONMENT)
MDH regulated activity

- Exploratory boring may be temporarily sealed for 10 years; unless a variance is requested

Permanent Sealing

- On-going field activity for the next 5 years
- Filling the boreholes with neat cement; Portland Cement & Water
- Generally 2 Phases: Ph I (Frozen conditions) Ph II (All Season)
FIELDWORK

Acoustic Televiewing
ACOUSTIC TELEVIEWING
Data collection

- Fracture orientation and evaluation
  - Frequency
  - Rock mass strength
  - Hydro-geo-physical (HGP) testing of boreholes
    - Determine discrete intervals for testing

- Borehole diameter inspections
  - Borehole Sealing preparation
Final thoughts
Environmentally Responsible Economic Investment & Local Job Creation

- ~$1.2 billion investment in further design & construction
- Several million labor hours during 3-year construction period
- 650 direct mining jobs
- 1,300 spinoff jobs in other industries
- State and federal taxes and royalties
WHAT ARE WE UP AGAINST?
Questions?

www.twin-metals.com