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#### Who is Twin Metals Minnesota?

Twin Metals Minnesota is pursuing the development and operation of an underground copper, nickel, platinum, palladium and gold (strategic metals) mining project in northeastern Minnesota.

Twin Metals Minnesota has offices in St. Paul, Ely and Babbitt, Minn.







### Who is Twin Metals Minnesota?



• Approx. 32,000 acres of property interests.

• Babbitt 10 miles to the SW and Ely 15 miles to the NW.

• Three mineral deposits: Maturi, Spruce Road and Birch Lake.

• Anticipate up to 100 years of mining production and employment.





#### TWIN METALS MINNESOTA CURRENT PROJECT TIMELINE



## Twin Metals Minnesota Prefeasibility Study (PFS)

- Critical project details form foundation for rigorous and thorough environmental review by state and federal agencies.
  - Environmental impacts and controls
  - Mine design and processing rates
  - > Type of ore processing
  - Facility locations
  - Transportation methods and routes
  - Power sources and transmission routes
  - Economics: jobs, revenues, taxes, royalties
- PFS completion 2014+; focus on quality analysis and fully informed decisions.





## **Twin Metals Minnesota Update: PFS Field Activity**

- More than 400 holes; 1.4 million feet of core processed; largest drilling program in Minnesota history.
- Ongoing drilling project in area known as "Maturi SW" through spring 2013.
- Planning stage
  - Access for future environmental well installations
  - Possible underground bulk sample program for metallurgical and environmental testing
  - Fence drilling and additional infill drilling







### **Twin Metals Current Resource Estimates**

- One of the world's largest Cu-Ni-PGM polymetallic deposits
- December 2012 AMEC Report for Duluth Metals
  - Indicated resources\*
    - ≥13.7 billion lbs copper
    - ▶4.4 billion lbs nickel
    - ▶21.2 million ozs palladium+platinum+gold
  - Inferred resources\*
    - ▶11.8 billion lbs copper
    - ▶4.0 billion lbs nickel
  - 12.8 million ozs representing an average 19% increase from the June 2012 interim AMEC Report
- Exploration target areas include additional potential resources







\* Using a 0.3% cut-off



# **Twin Metals Minnesota Preliminary Long-term Job Estimates**









# Twin Metals Minnesota

## **Commitment to Environmental Responsibility**

- Protect Minnesota's Pristine Wilderness, Natural Environment and Recreational Resources
- Exceed State and Federal Environmental Protection Standards:
  - Project will face rigorous, thorough and lengthy environmental review by multiple state and federal agencies and Native Tribes
  - State and federal environmental permits protecting water, air, land and wildlife will include stringent standards
  - Project MUST exceed those standards, or it will not be approved







### State of the Art Environmental Protection

- Closed loop processing
- Liners and leak collection systems
- Filtered (dry stack) tailing
- Acid generation prevention
  - Remove or consume sulfides during processing
  - Concurrent reclamation
  - Underground backfill
- Air emission controls
- Waste minimization/reuse
- Pursuing ISO 14001 Certification







## **Anticipated Key Environmental Studies**

#### **Baseline surveys**

- Lake & stream chemistry
- ► Lake & stream flows
- Lake & stream sediments
- ➤Wild rice
- ➤Wetlands
- ➤Groundwater
- ➤T&E, sensitive, and indicator species
- ≻Aquatic Biota
- ➤Cultural resource
- Meteorology & air quality
- ➢ Socioeconomics
- ≻Noise & light



# Modeling, assessments, and impact evaluations

- ➤Visual simulations
- Surface water/wetland/hydrogeologic interactions and predictions
- Biological resource protection
- >Air quality predictions
- Noise & light impacts
- Closure & reclamation planning
- ➤Greenhouse gas evaluation









#### TWIN METALS MINNESOTA CURRENT PROJECT TIMELINE



# **Environmental Permitting Process**

# Key permits and environmental reviews

- Minnesota permit to mine
- Stormwater discharge permit
- Wetlands permit
- Air quality permit
- National Environmental Policy Act (EIS)
- Minnesota Environmental

Policy Act (EIS)

#### Key stakeholders

- Community
- Native Tribes
- ➢ U.S. Forest Service
- U.S. Bureau of Land Management
- U.S. Environmental Protection Agency
- ➤ U.S. Army Corps of Engineers
- > MN Department of Natural Resources
- MN Pollution Control Agency
- MN Board of Water & Soil Resources





#### Why Operate and Build Responsibly?

- To meet strict local, state and federal requirements
- To obtain financing and protect an investment
- To preserve the natural environment on which many depend and enjoy
- To attract and retain the best people
- Consistent with Twin Metals Minnesota values







