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 NE Minnesota.

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

Twin Metals MN LLC (USA)
Corporate Structure, Organization & Ownership of Mineral Deposits

- Antofagasta PLC.
  - ANTO: 40%
- Duluth Metals Limited
  - DML: 60%
- Twin Metals MN
  - TMMN: 100%
    - (by 06/2011)
  - DML: 100%
    - (until 06/2011)
- Franconia
  - 70%
- Beaver Bay
  - 30%

Birch Lake Joint Venture
- Maturi Deposit
- Spruce Road Deposit
- Birch Lake Deposit
Minnesota Will Be A Global Leader

More than 4 billion tons of strategic metal resources estimated in Minnesota – world’s largest undeveloped strategic metals deposit.

The North America Tapestry of Time and Terrain
modified from: USGS Geological Investigation Series I-2781

Precambrian Geologic Map of Minnesota
modified from: Minnesota Geological Survey State Map Series S-20, 2000
Twin Metals Minnesota
Part of Northern Minnesota’s Mining Range
• 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.
It is the policy of the state to provide for the diversification of the state’s mineral economy through long-term support of mineral exploration, evaluation, environmental research, development, production, and commercialization. (MN Stat. 93.001)

**Total Mineral Acreage: 25,190**

- Federal Minerals = 55%
- State Minerals = 25%
- Private Minerals = 20%

First 25 years of mine plan expected to focus on large percentage of state and private minerals.
To date, more than $160 million has been invested in exploration and project development activities, supporting some 175-200+ direct and consultant/contractor jobs.

**Ely & Babbitt, Minn.**
- Employees: 20
- Drillers/Contractors: 140-160

**St. Paul, Minn.**
- Employees: 20
- Contractors/Consultants: 20~
Twin Metals Minnesota
Supporting Minnesota Businesses

2011-12(H1) Vendor Spend = $80 Million

- Minnesota: 74%
- United States: 18%
- Canada: 7%
- Other: 1%
Twin Metals Minnesota
Prefeasibility Study (PFS) Update
Twin Metals Minnesota Prefeasibility Study (PFS)

- Critical project details form foundation for rigorous and thorough environmental review by multiple 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+; metallurgical studies added to PFS; focus on quality analysis and fully informed decisions.
Twin Metals Minnesota PFS Update (Fall 2012)
“In-fill” Drilling

• Main PFS field activity to-date

• Have had up to 12 rigs operating; > 400 holes; 1.4 mil. ft. of core processed; largest drilling program in MN history

• Core samples analyzed in determining mineral processing, environmental protections, mine engineering and operations

• Latest drilling phase complete – no rigs currently operating

• Drilling activity could resume spring 2013
Twin Metals Minnesota PFS Update (Fall 2012)
“In-fill” Drilling

First half of 2012:
Drilling investment = $13 million; supporting 140-160 full time (equivalent) jobs
Twin Metals Minnesota PFS Update (Fall 2012) Revised Resource Estimate

• Updated mineral resource estimate released June 2012 (see website for details)

• Significant increases in the copper, nickel, platinum, palladium and gold resources within the project area; confirms TMM Copper-Nickel-PGM deposits are among the world’s largest

• Larger qualified resource base than previous historic estimates; greater expansion potential in the defined Exploration Target Areas

• Highlights platinum group metals and gold resources within the TMM Project that make it among the largest platinum and palladium resources outside of South Africa

• New resource model due Q4 2012
Twin Metals Minnesota PFS Update (Fall 2012)

Environmental Studies

- Lake and stream water quality sampling
- Wild rice surveys
- Material characterization testing (short and long-term tests on ore, development rock & tailings)
- Archaeology screening surveys and collaboration with local Native American tribal bands
- Meteorology and air quality sampling
Twin Metals Minnesota PFS Update (Fall 2012)
Future Additional Baseline Studies

- Expanded lake and stream sampling
- Expanded wild rice surveys
- Additional archeology and cultural resource surveys
- Wetlands and sensitive soil surveys
- Sensitive, threatened, and endangered species surveys (flora & fauna)
- Forest health studies
- Groundwater studies
Twin Metals Minnesota PFS Update (Fall 2012)

Mineral Processing

- Metallurgical testing of core samples from “in-fill” drilling ongoing in multiple labs across the world

- Several processing options and technologies remain under consideration
Twin Metals Minnesota PFS Update (Fall 2012)
Mine Plan & Facility Siting

- Mine plan focusing on Birch Lake and Maturi deposits
- Siting of various processing facilities under continued study (e.g. crushers, concentrator, paste fill plant, mine access, ventilation shafts)
Twin Metals Minnesota PFS Update (Fall 2012)
Tailings Storage Facility (TSF) Siting

- Narrowing options: rigorous study using multiple criteria (e.g. watershed, wetlands, brownfield v. greenfield, environmental sensitivity, land ownership, transportation and energy corridors, etc.)

- Seeking approx. 1,300 acres to hold 50% of tailings at mining rate of 80,000 tons/day for 25 years

- Primary focus on “dry stack” tailings – smaller footprint; water conservation and reuse

- 50% tailings backfilled in underground mine, limiting surface impacts
Twin Metals Minnesota PFS Update (Fall 2012)
Key Stakeholder Engagement

• Public information forums in Ely, Virginia, Babbitt & Hoyt Lakes

• Project status presentations to numerous public and government organizations

• Meetings and info sharing with tribal leaders and environmental/historic preservation staff

• Close engagement with state and federal regulatory agencies and staff

• Expanded public information channels
Twin Metals Minnesota PFS Update (Fall 2012)
Partnerships to Educate & Train Future Workforce
Twin Metals Minnesota “Jobs for Generations”

Annual Mining Wages 2010
Source: U.S. Bureau of Labor Statistics

MINING JOBS COMPARED TO OTHERS

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<th>AVERAGE WAGES</th>
<th>ALL INDUSTRIES AVG. IN MN</th>
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+ 54%
+ 47%
Twin Metals Minnesota PFS Update (Fall 2012)
Preliminary Long-term Job Estimates (Operations)
Twin Metals’ “Jobs for Generations”

- Twin Metals will employ a variety of skilled Minnesotans: geologists, engineers, carpenters, safety inspectors, mine designers, mapping experts, mechanics, electricians, miners, truck drivers, drillers, IT professionals, business administration

- Twin Metals job openings can be followed on our website: 

Thank You.

Project information is frequently updated on the Twin Metals Minnesota website:

www.Twin-Metals.com