

Twin Metals Minnesota (TMM) Project

Update

Ely City Council

September 28, 2015



Twin Metals Minnesota

- **Twin Metals Minnesota (TMM) is pursuing the development and operation of an underground copper, nickel, and PGM metals mining project.**
- **The TMM Project is located in the Iron Range region of northeast Minnesota.**
- **Twin Metals is a wholly-owned subsidiary of Antofagasta plc, one of the world's leading copper mining companies.**



Twin Metals Minnesota – Antofagasta Ownership



ANTOFAGASTA PLC

Chilean-based copper mining company w/ additional operations in transportation and water distribution.

- **Top 10 global copper producer w/four Chilean operations.**
- **Member - International Council on Mining and Metals: focus on sustainability and environmental stewardship.**
- **Strong balance sheet. Long-term investment focus. World-class technical & operational expertise.**
- **Antofagasta has operated in Minnesota since 2010.**

Our Commitment to NE Minnesota

- **Duluth Metals Ltd. began operations in Ely in 2006.**
- **Twin Metals opened Ely office in summer 2011.**
- **Opened Ely Core Storage Building spring 2013.**
- **Past 4 yrs. 8-19 full time employees located in Ely.**
- **Total investment to date – contractors, infrastructure, personnel ~ \$250 million.**



Twin Metals Community Outreach & Support

Twin Metals is proud to invest in our communities.

Five Areas of Community Support:

- Health and Wellness
- Economic Development
- Education
- Environmental Stewardship
- Personal and Community Safety

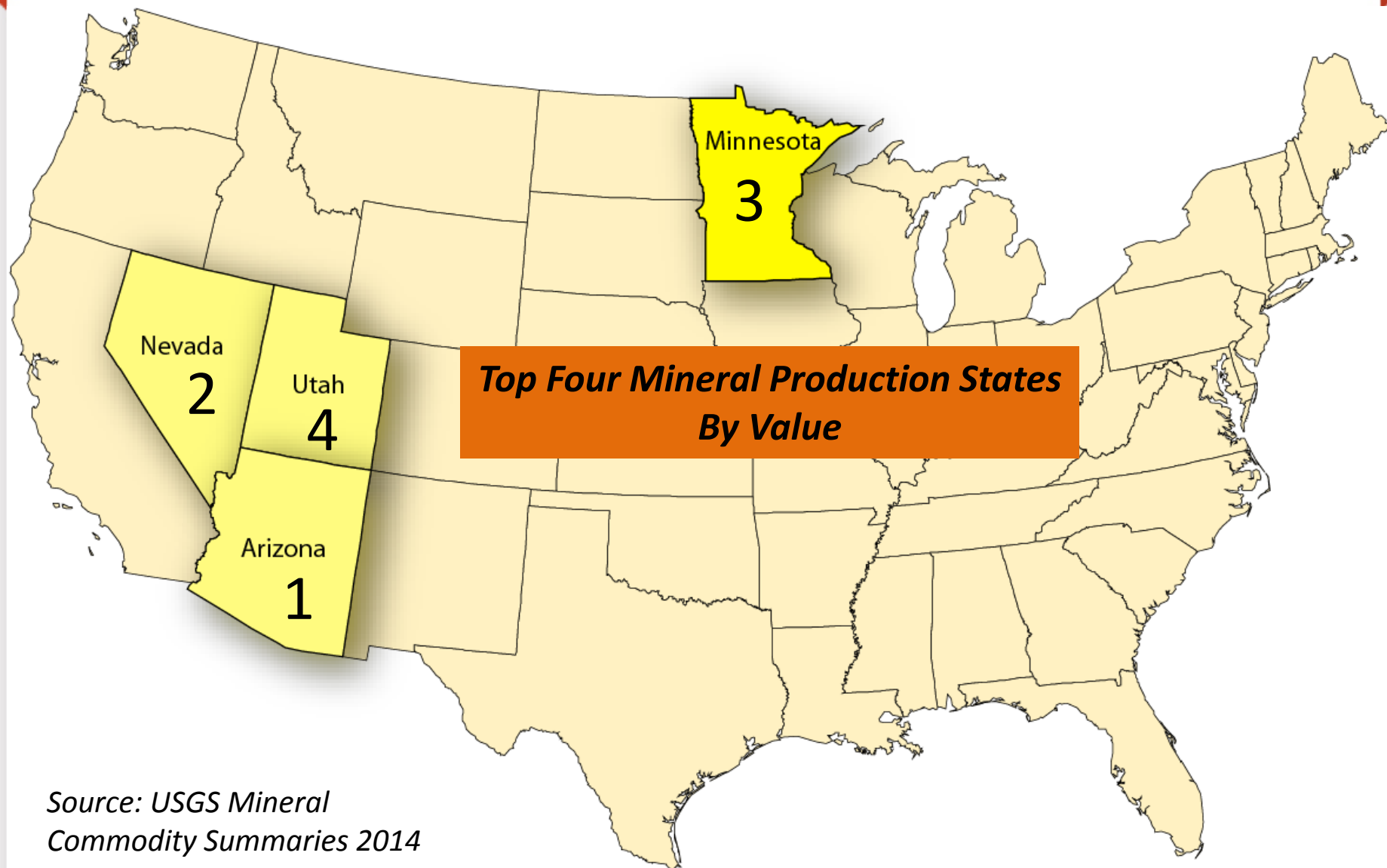
More than \$300K Contributed since 2010:

- United Way of Northeastern MN
- Ely Area Food Shelf
- Hunger Solutions
- Friends of the Trees of Ely
- St. Louis and Lake County Rescue
- Northwoods Partners
- Ely Greenstone
- Mesabi Symphony Orchestra



MINNESOTA'S MINING POTENTIAL

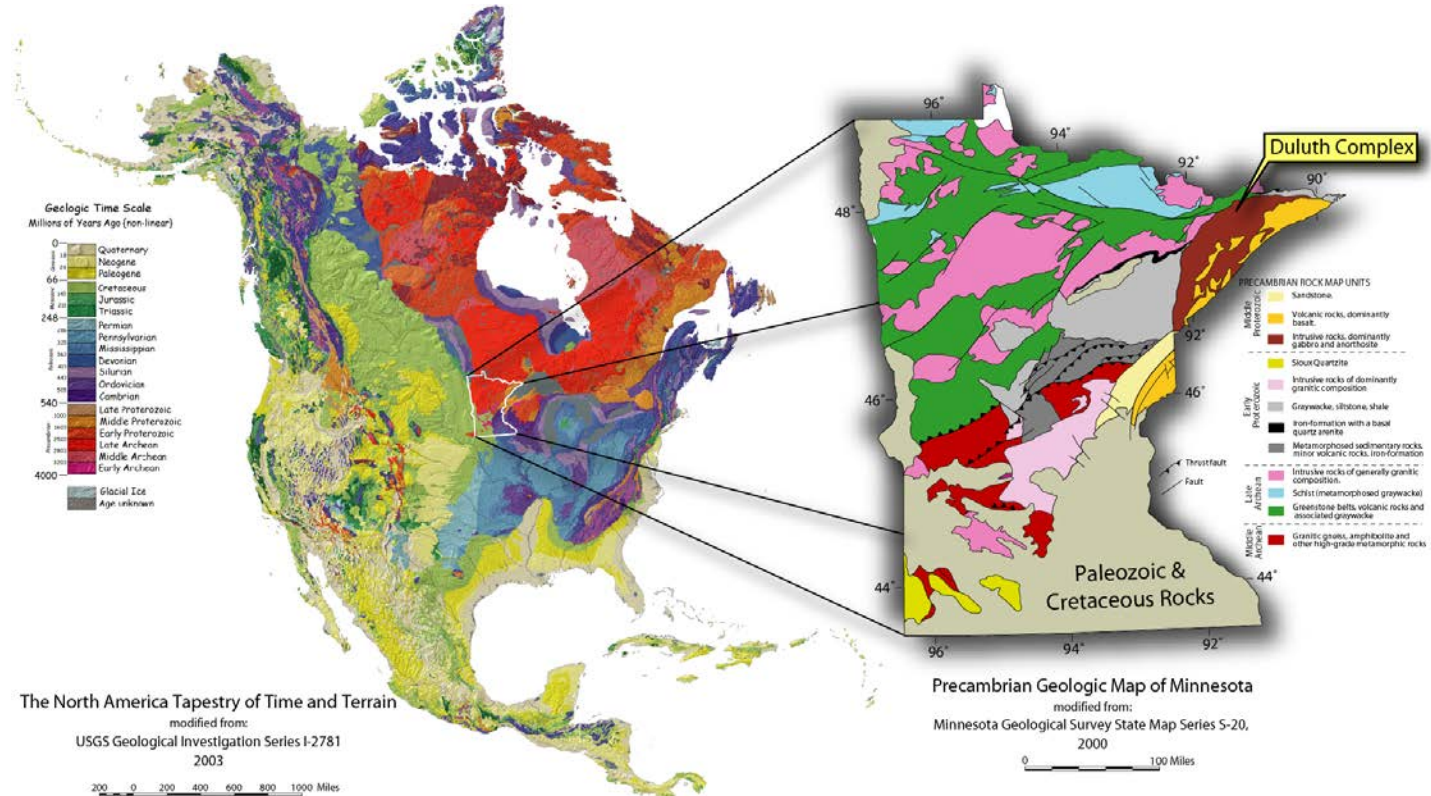
National Significance



Source: USGS Mineral
Commodity Summaries 2014

Minnesota Poised to be a Global Leader

There are more than 4 billion tons of ore containing copper, nickel and other metal resources within Minnesota's Duluth Complex, which represents the largest known undeveloped deposit of strategic metals in the world.



Duluth Complex – Strategic Metals



Copper

Uses: Wire, pipe & tubing, electrical generation & transmission, electrical components, telecommunications, computer technology, solar energy and wind turbines



Nickel

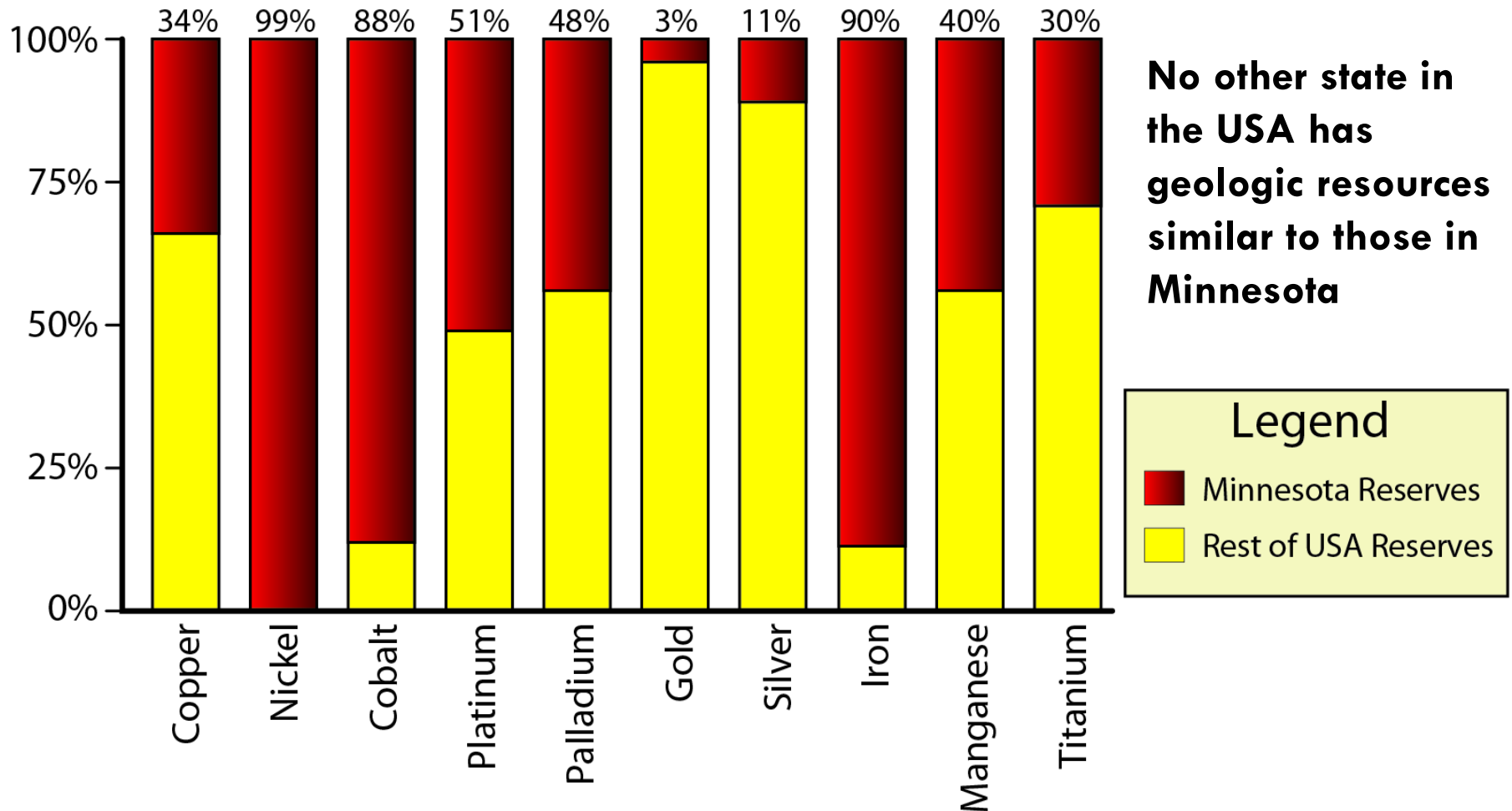
Uses: Stainless steel, specialty-alloys & super-alloys, combustion turbines, aircraft & aerospace, and military applications



**PGMs:
Platinum &
Palladium**

Uses: Petroleum cracking & refining, chemical catalysts, pollution control catalysts, fuel cells and jewelry

Minnesota's Mineral Endowment



Source: USGS commodity reports integrated w/ published data from MN mines/projects

Minnesota Mineral Policy

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 Statute 93.001 – “Policy for Promoting Mineral Development”

The legislature intends that it is the goal of the permanent school fund to secure the maximum long-term economic return from the school trust lands consistent with the fiduciary responsibilities imposed by the trust relationship established in the Minnesota Constitution, with sound natural resource conservation and management principles, and with other specific policy provided in state law.

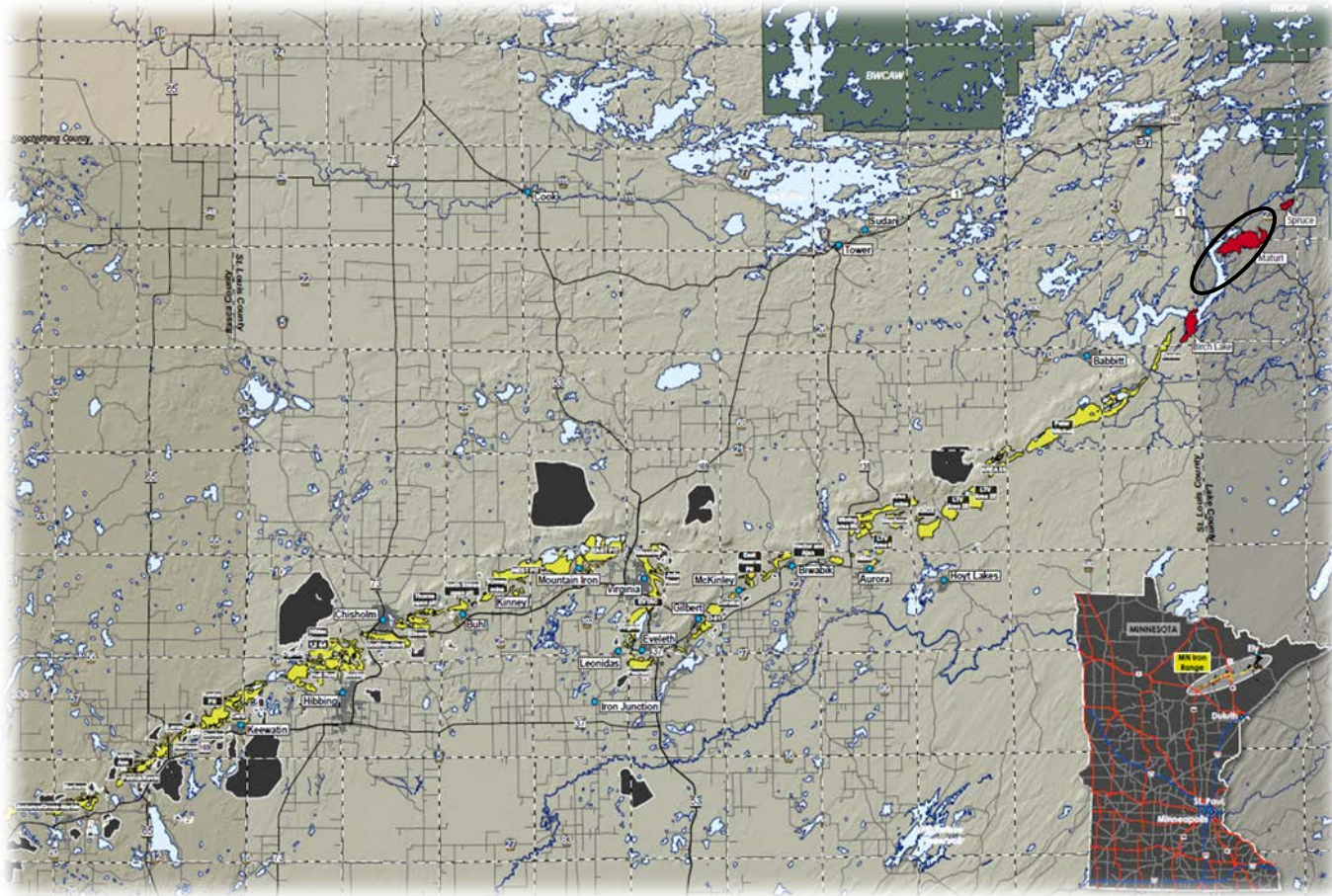
MN Statute 127A.31 – “Goal of the Permanent School Fund”

The DNR Administers 2.5 million acres of School Trust lands

TMM PROJECT STATUS UPDATE

TMM Project - General Location

The TMM Project is located in the northern tier of Minnesota's Iron Range, within the "Duluth Complex."



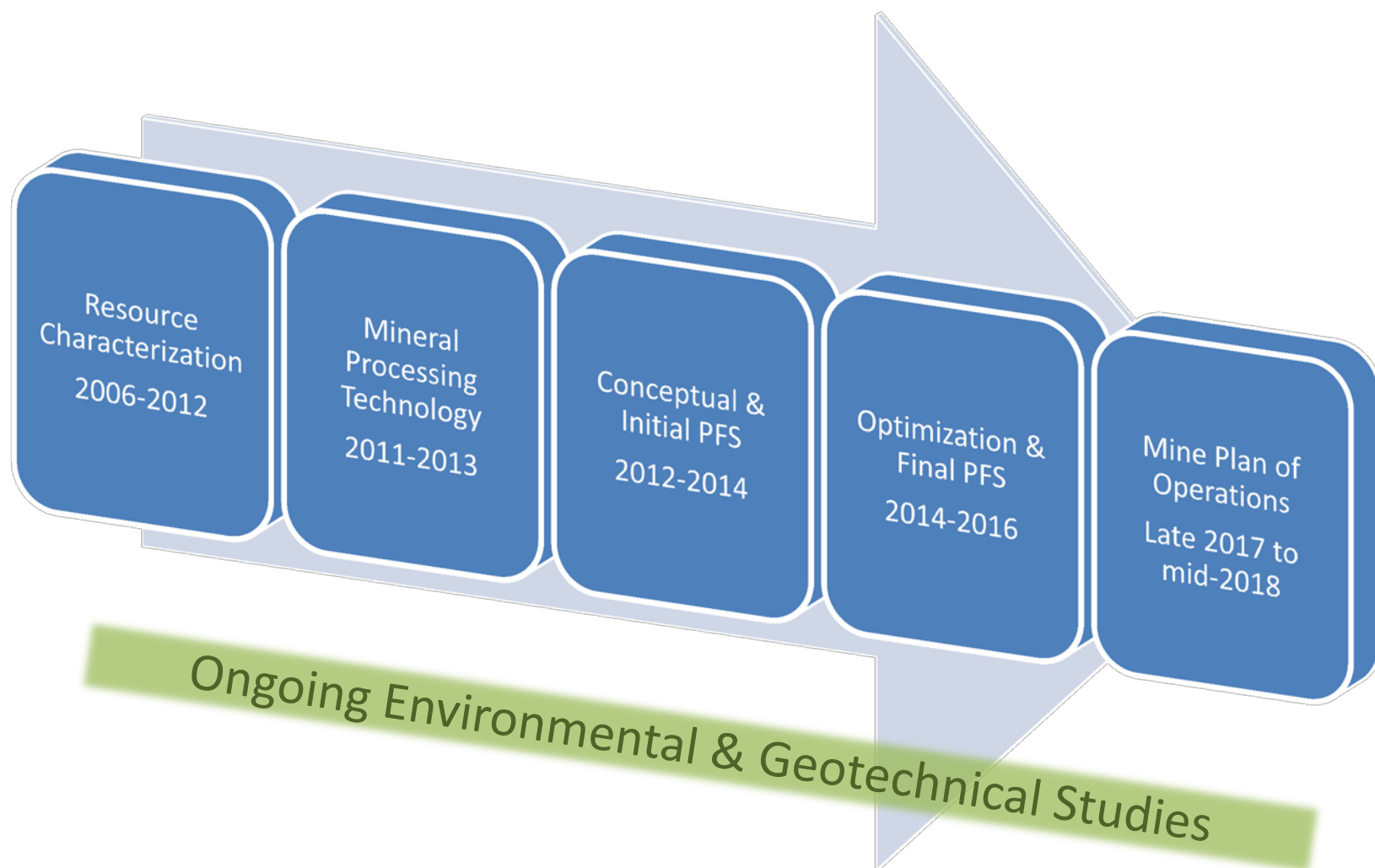
TMM Project – 2014 Prefeasibility Study

A TMM Project Prefeasibility Study (PFS) was completed June 2014. PFS Technical Report issued October 2014.

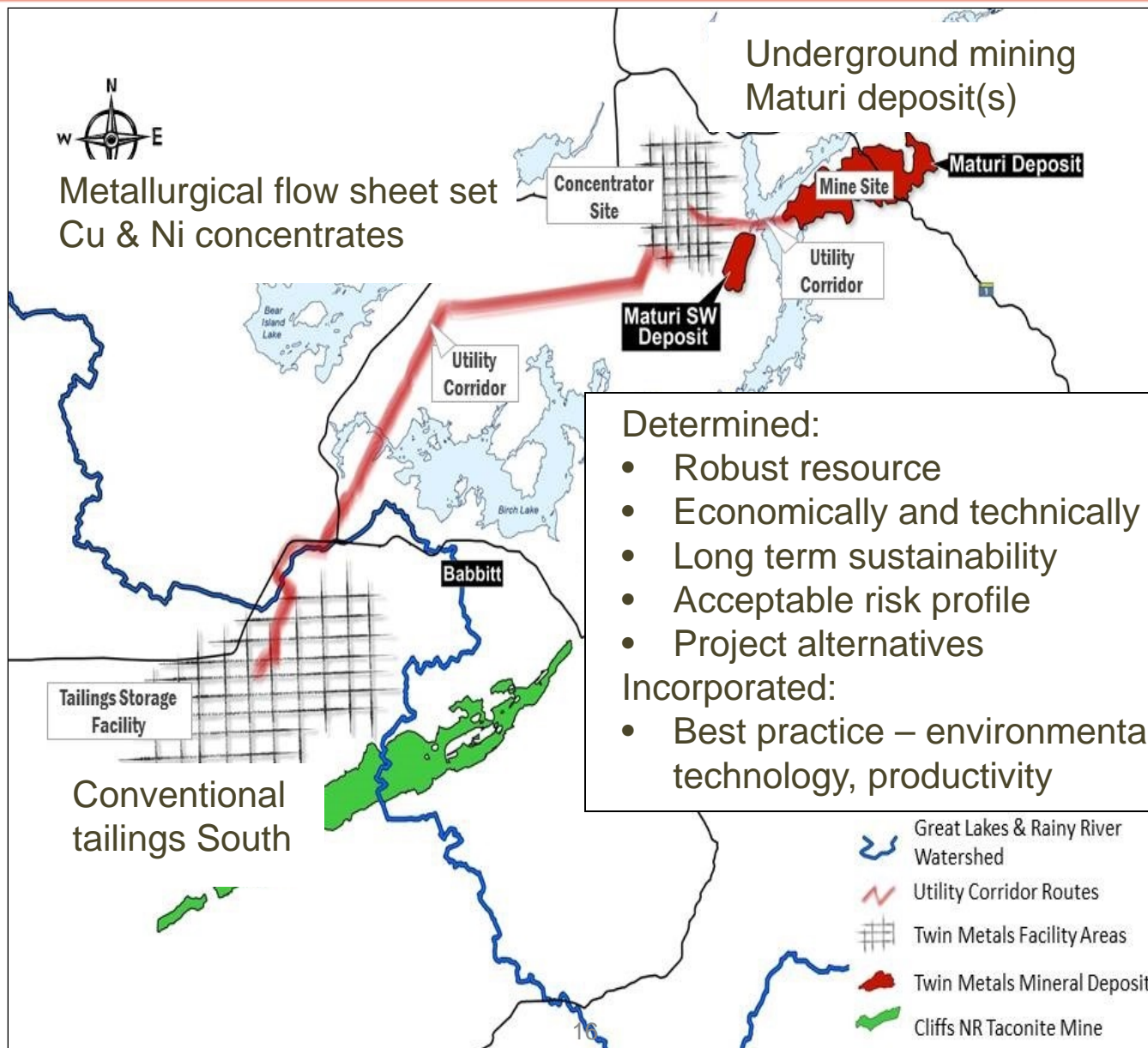
- **The PFS examined a conceptual mine plan to establish a foundation for further engineering, economic and environmental study.**
- **Changes to PFS conceptual mine plan are likely based on ongoing analysis.**
- **Long-term Goal: develop and submit formal mine plan proposal to state and federal agencies for formal environmental review.**



TMM Project Timeline



October 2014 Technical Report



Project Optimization Studies

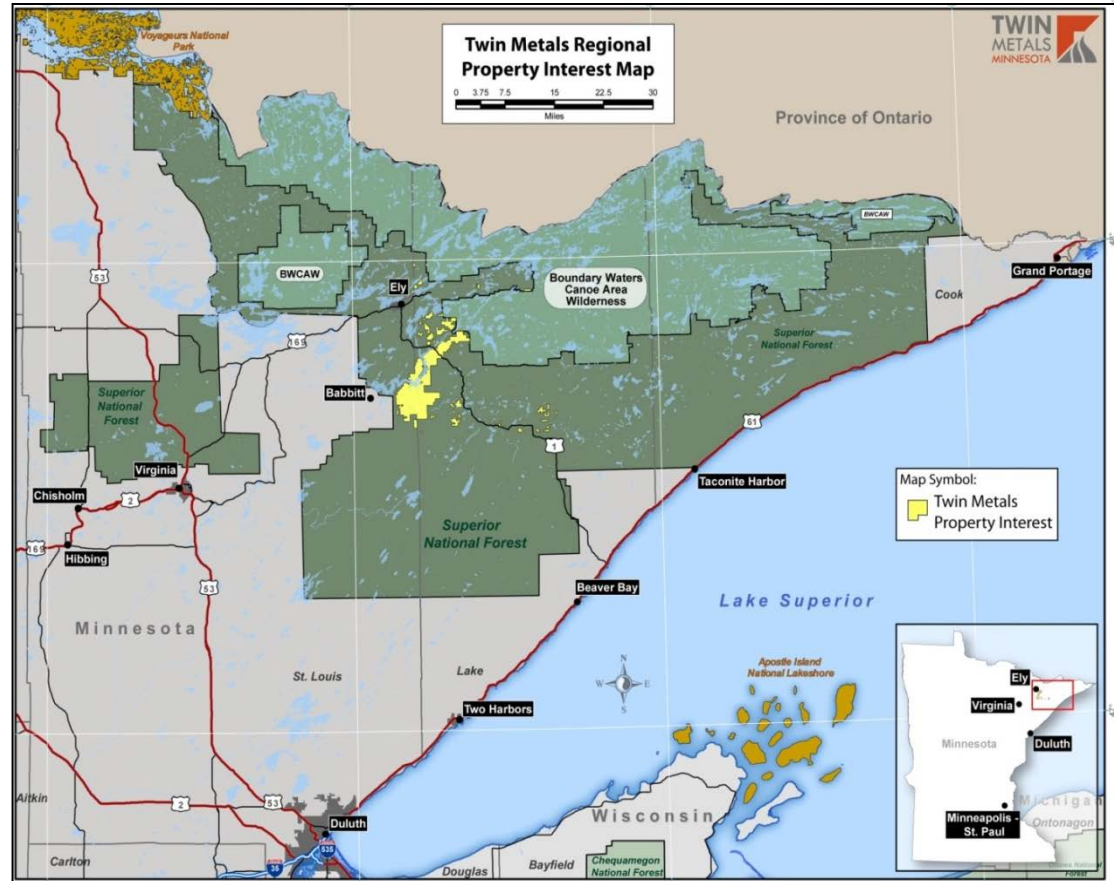
Based on everything we now know, Twin Metals is taking a critical look at the project to define the optimum configuration to put forth for further technical and environmental studies:

- **Mine Scope, Mine Size & Mining Rate – It will be an Underground Mine.**
- **Tailings Processing & Storage – Method and location.**
- **Transportation Corridors and Facility Locations – Consolidation, wetlands, visual, etc.**
- **Water Appropriation and Management.**

MINING WITHIN THE SUPERIOR NATIONAL FOREST

Mineral Development in SNF is Appropriate

- The TMM Project is located within the Superior National Forest (SNF).
- Exploration and development of minerals are listed as a “desired condition” under the 2004 SNF Land and Resource Management Plan.



Legislative History for Minerals in the SNF

1909: Pres. Roosevelt established the Superior National Forest via proclamation No. 848.

At that time public domain minerals w/in the SNF had been previously reserved from the General Mining Law of 1872.

1950: National Forests in Minnesota:
authority to prospect, develop, mine,
remove mineral resources: Congress explicitly made available public domain minerals within the SNF for mineral exploration and development.



Mineral Development in SNF is Appropriate

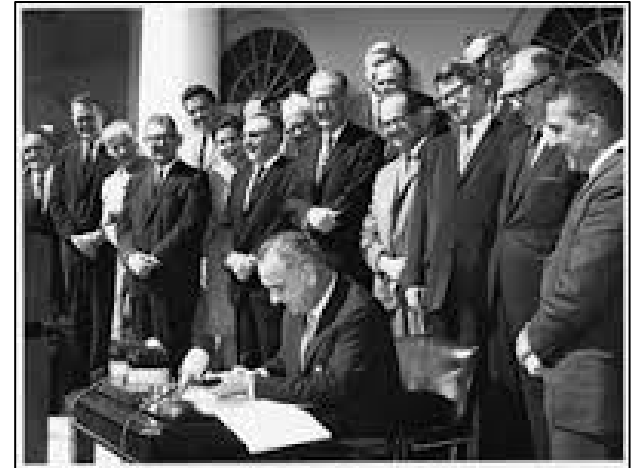
1964: Wilderness Act of 1964 set aside lands and designated them as Wilderness Areas; the act expressly allowed for prospecting and mineral development to occur w/in wilderness areas, but withdrew affected minerals after January 1, 1984.

❖ *Federal mineral leases MNES 1352 & 1353 were granted in 1966.*

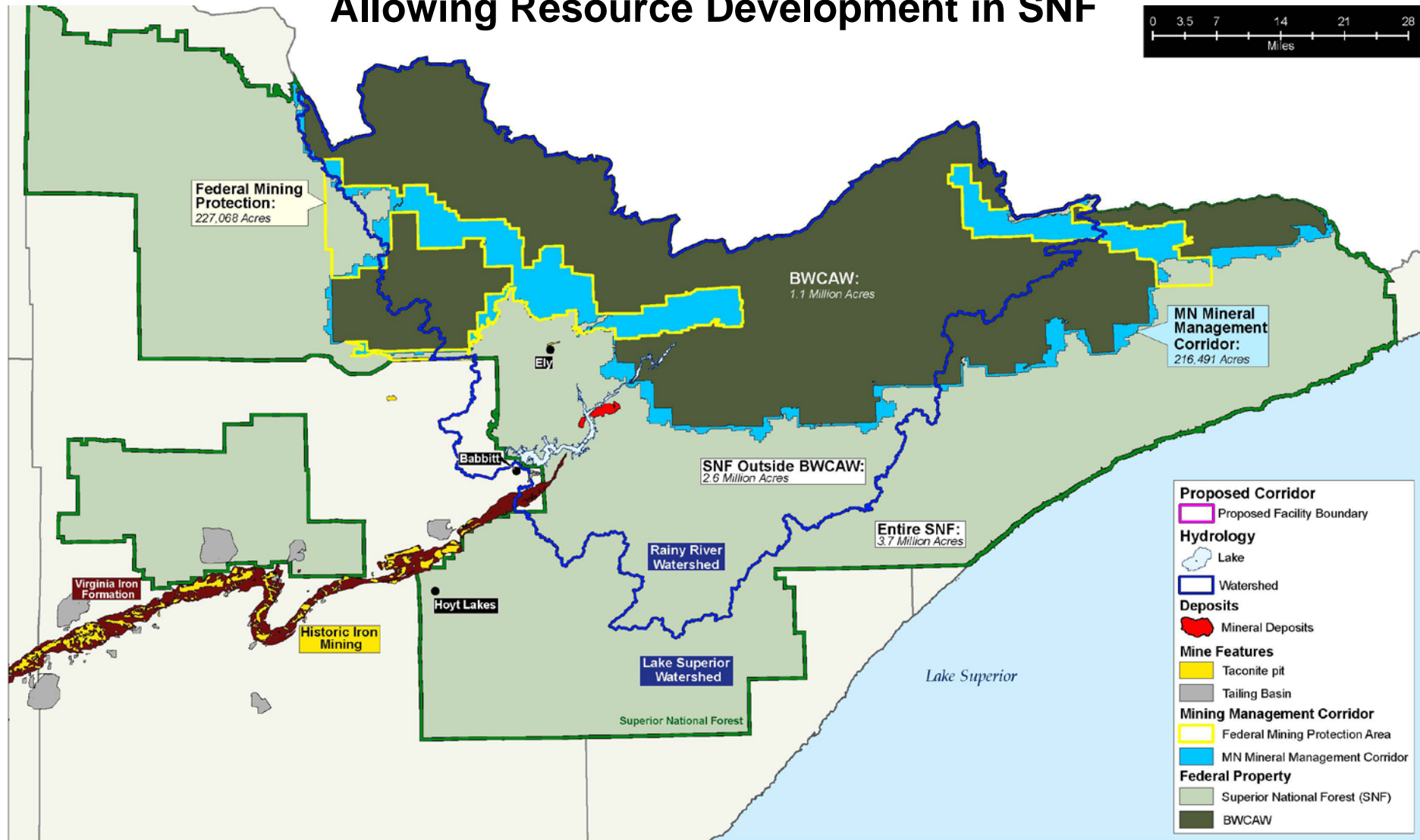
1978: BWCAW Act codified a federal-state compromise setting aside certain areas for wilderness protection, while maintaining mining within the SNF outside of the BWCAW.

❖ *Within the BWCAW Act, Congress established the “Mining Protection Area,” a defined buffer zone outside the BWCAW.*

2003: Minnesota Outdoor Recreation Area Act.
State of MN creates state wilderness as a buffer.



Federal, State, and Private Party Agreement: Protect BWCAW While Allowing Resource Development in SNF



National Policy on Mineral Development



- **Congress has purposely authorized acquisition and development of minerals within the Superior National Forest.**
- **Mining within the SNF is in the direct interest of the United States.**
- **1978 compromise: no mining w/in the BWCA, but mining could and should occur in other areas of SNF.**
- **Failure to allow federal mineral development w/in SNF would significantly impact state minerals and state school trust lands.**

ENVIRONMENTAL STEWARDSHIP

TMM Project – Environmental Commitment

TMM is committed to protecting Minnesota's wilderness, natural environment & recreational resources.

- **TMM Project must meet state and federal environmental standards to be approved:**
 - ✓ **Rigorous environmental review by state & federal agencies and tribal governments.**
 - ✓ **State and federal permits protecting water, air, land and wildlife will include stringent environmental standards.**



Environmental Regulation/Oversight

The TMM Project is under the regulatory oversight of state and federal agencies.

- **MN Dept. of Natural Resources**
- **MN Pollution Control Agency**
- **Tribal Governments**
- **US Forest Service**
- **US Bureau of Land Management**
- **US Army Corps of Engineers**
- **US Environmental Protection Agency**



TMM Project - Key Permits & Regulatory Agencies

State Permits

- **Minnesota Department of Natural Resources**
 - Permit to Mine
 - Water appropriation
 - Minnesota Wetland Conservation Act
 - Dam safety
- **Minnesota Pollution Control Agency**
 - Construction and operating air emissions permit
 - Wastewater and stormwater discharge NPDES/SDS
 - MN State Executive Council
 - State lands lease/sale authorization

Federal Permits & Authorizations

- **BLM**
 - Plans of Operation for data collection activities
 - Mine Plan of Operations approval
 - ROW for decline
- **Other Federal Agencies**
 - Clean Water Act Sections 404 & 10 wetlands / waterways permits (COE)
 - Underground Injection Control for backfill (EPA)
 - Endangered species incidental take Permits (USFWS and permitting agencies)

TMM Project - Environmental Studies

Baseline studies and impact predictions required for environmental review and permitting

- • **Surface water (7)**
- • **Groundwater**
- **Wetlands**
- • **Wild rice (4)**
- • **Air quality (1+)**
- **Sensitive species**
- **Invasive species**
- **Soundscapes**
- **Visual resources**
- **Cultural resources**
- **Materials characteristics**
- **Reclamation**
- **Land use**
- **Biodiversity**
- **Greenhouse gases**
- **Recreation**
- **Traffic**
- **Socioeconomics**
- **Human health impacts**
- **Environmental justice**



ECONOMIC IMPACTS

State & Regional Economic Impact

2009 UMD Study (long-term impacts):

- All potential copper-nickel mining projects: > 12,000 MN construction jobs and > 5,000 long-term mining jobs created.

2012 UMD Study (focus through 2016):

- Copper-nickel project construction = \$1.7 billion impact to state; up to 2,000 jobs.
- Copper-nickel project operations = \$200 million impact to state; > 1,300 jobs.

MN School Trust Fund Revenues:

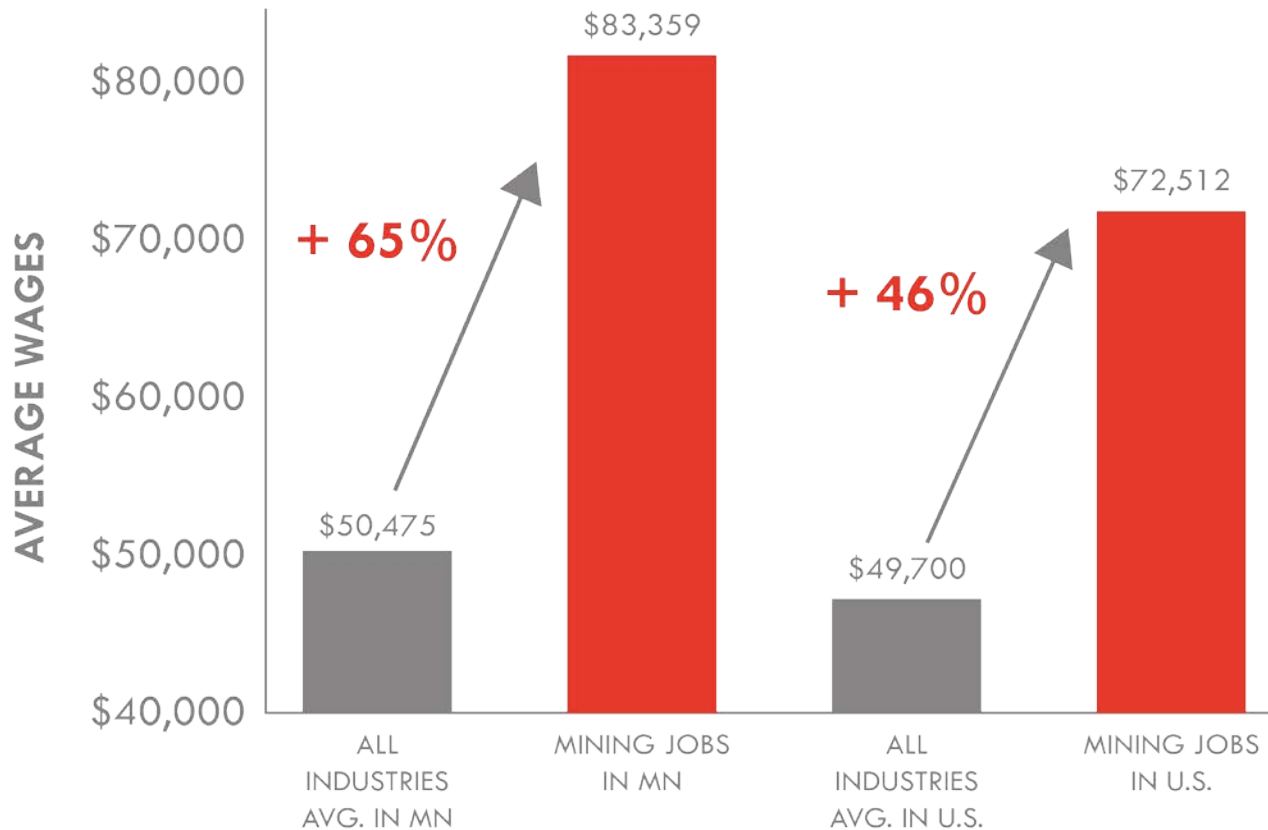
- 2011 DNR analysis: copper-nickel mining has the potential to generate > \$2.5 billion in royalty revenues for the MN School Trust Fund, nearly tripling the size of the trust.



Jobs For Generations

Annual Mining Wages 2013

Source: U.S. Bureau of Labor Statistics



MINING JOBS COMPARED TO OTHERS



Twin Metals Minnesota - Job Creation



- **TMM project could create hundreds of long-term mining jobs, and thousands of construction jobs.**
- **Every direct mining job creates another 2.1 to 2.5 indirect jobs (*UMD 2012*)**
- **Geologists, engineers, carpenters, safety inspectors, mine designers, mapping experts, mechanics, electricians, miners, truck drivers, business administration, and more.**



Jobs for Generations

Twin Metals Minnesota – MN Partners

TMM has partnered with numerous Minnesota businesses throughout the multi-year project development process, including:

IDEA Drilling

Kraus-Anderson

Barr Engineering

GHD

Golder Associates

Evergreen Construction

W.P. & R.S. Mars

Itasca Consulting Group

Northeast Technical Services

SEH

David Braslau Associates

Pace Analytical Services

Warren Johnson Excavating

Twin City Fan Companies

106 Group

AMEC

OSI Environmental

Foth

Merjent

Partnerships to Develop Future Workforce

NHED

Northeast Higher Education District

Member of Minnesota State Colleges and Universities

 **Iron Range Engineering**
MINNESOTA STATE UNIVERSITY MANKATO

**POSITIVELY
Minnesota**
Department of Employment and Economic Development



**NATURAL RESOURCES
RESEARCH INSTITUTE**



North Star AISES Alliance
and Professional Chapter

Welcome To NSAAP

*Working to increase representation of American Indians
and Alaskan Natives in engineering, science and other
related technology disciplines in the Upper Midwest*



COLORADO SCHOOL OF MINES
EARTH • ENERGY • ENVIRONMENT



"The rocks are the final court of appeal" Francis Pettijohn



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