

## **TMM Project Q&A**

**Twin Metals Minnesota (TMM) is submitting a Scoping Environmental Assessment Worksheet (SEAW) and a Mine Plan of Operations (MPO) documents to state and federal agencies to consider in their scoping of the Environmental Impact Statement (EIS) for TMM's proposed copper-nickel mine project. The documents are not meant as a definitive report on the project's impact or on baseline studies; that will come later in the EIS.**

**Scoping is an interactive process involving the company, agencies and the public to identify major decisions and potential impacts of the project to be covered in the EIS. Once the scope of the EIS is established, intensive review of potential impact, again including public input, begins.**

**This document addresses questions likely to be prompted by the SEAW and MPO submissions. Some are about the mine generally and others about the documents' content. The Q & A is abstracted from a variety of sources, including nearly 300 pages of detailed information in the SEAW and MPO.**

### **BASICS**

#### **Where is the mine going to be located? How deep will it go?**

The Twin Metals mine will be located within the Maturi deposit, which is located approximately nine miles southeast of the city of Ely, Minnesota, and 11 miles northeast of the city of Babbitt, Minnesota. It is located on land that has been designated for both mining and logging as part of the U.S. Forest Services Superior



National Forest Plan. Mining will occur from 400 feet underground to a depth of potentially about 4,500 feet.

**You have talked about this as a modern, 21<sup>st</sup> century mine. How so?**

Twin Metals Minnesota is committed to operating a **safe 21st century underground mine** – safe for workers and the environment – and will use the environmentally friendly dry stack method to manage tailings.

When we say 21<sup>st</sup> Century Mine, we mean:

A mine that is designed, built, operated and reclaimed in a way that prioritizes environmental protection and stewardship, worker safety and community engagement.

This mine will have the advantage of technological developments that have significantly reduced the potential impacts on land, water and air. Features of this mine include:

**Minimal surface footprint**

Mining activity will take place underground at between 400 and 4,500 feet below the surface. About 80% of mining will occur below 1500 ft and about 40% of mining will occur below 2700 ft. The Twin Metals mine has a surface footprint that is 80 to 85 percent smaller than an open pit mine with similar production capacity.

**Precision targeting of minerals**

More than a decade of study of the deposit have clearly mapped the location of the minerals to be mined. Three-dimensional modeling allows for accessing and extracting only the ore that contains the valuable minerals. The project is designed so that no waste rock will be stored on the surface at the TMM mine.

380 St. Peter Street, Suite 705  
St. Paul, MN 55102 USA

Tel: +1 651 842 6800  
Fax: +1 651 842 6801

[www.twin-metals.com](http://www.twin-metals.com)

### **Safety**

The mine will be accessed, and ore will be transported via two tunnels (or declines) at the processing site. Workers are transported to a mining site within the mine in vehicles driven down a tunnel. This is an improvement over the outdated method of lowering miners down a shaft in an elevator to access an underground mine.

The Project will operate under National Mining Association CORESafety Program standards, a systematic approach to developing a safety culture.

### **Water management**

The Project would not discharge process water and is designed not to require discharge of contact water. Water used in the mineral concentration process would be reused on site.

### **No acid rock drainage**

Modern exploration methods have allowed us to develop a deep understanding of the unique features of the Maturi Deposit in the Duluth Complex. Due to the unique geology of the Maturi Deposit and TMM's mining method, tailings will be non-acid generating. Almost all sulfide will be removed during the concentration process, bound to our target minerals, which will be extracted and shipped to customers in shipping containers.

### **Tailings Management**

TMM will manage tailings using the most environmentally friendly technology available, commonly referred to as dry stacking or filtered tailings.

Up to 50 percent of tailings will be permanently returned underground as cemented engineered backfill.

The remaining tailings will be filtered and stored within the project site in a lined dry stack mound that is concurrently reclaimed with native soil and vegetation.

This tailings management technology means there will be no tailings pond or dam on site. Any risk of a dam failure is eliminated.

### **Reclamation**

Through a process called progressive reclamation, the project site will be replanted with native vegetation after operations are complete. Reclamation allows for the area to return to a natural state that can be used for other purposes and will reflect the topography and surrounding natural elements. The underground facilities are designed to be sealed upon closure.

### **What will the processing site include?**

TMM's processing site will include two 1.25-mile declines, or downward-sloped tunnels. One will transport workers underground in trucks and the other will hold a conveyor belt to move crushed ore to the plant site, where target minerals will be extracted through a concentration process.

The site will also include a concentrator building, a tailings filtering facility and a dry stack facility to store the filtered tailings.

### **How will the actual mining proceed?**

The underground mine will be divided into five zones, mined sequentially. The mining will happen in areas called stopes that are opened through drilling and blasting. Ore will be crushed underground and then conveyed to the plant site on a conveyor belt. By

utilizing dry stack tailings management technology, up to half of the tailings will be mixed with a cement material and backfilled into the underground stopes.

The declines will be used to reach all stopes with trucks and other equipment, and to hold the conveyor belt. One analogy for visualizing the mine process might be riding an escalator down to successive basement floors in a department store, stopping off to remove the items from each floor, then sealing off the floors in turn.

### **How does the mining method of Twin Metals compare to other underground mines?**

There are others mines around the world of similar size using the well-established dry stack tailings storage method and using similar mining methods. Eagle Mine in Michigan is a nearby example of an active modern underground copper and nickel mining operation (though Eagle Mine utilizes an existing iron mine open-pit that is filled with water for its tailings management).

Some examples of North American mines operating or permitted utilizing dry stack tailings include:

#### *Currently Operational:*

Eleonore (located in Quebec)

Greens Creek (located in Alaska)

Pogo (located in Alaska)

Raglan (located in Quebec)

#### *Permitted - not yet operational:*

Pumpkin Hollow (located in Nevada)

**How close will the mine be to the Boundary Waters Canoe Area Wilderness border?**

The project is located outside the BWCAW and its associated state and federal buffer zones in which mining is prohibited. The project is about five miles from the closest edge of the BWCAW.

**COPPER, NICKEL, COBALT AND PGM USES**

**What are copper, nickel, cobalt, and platinum group metals used for?**

**Copper**

- Our houses, electrical pipes. About 400 pounds of copper are in a standard house.
- Wind turbines: 4.7 tons of copper in a single wind turbine
- Cars: 75 pounds of copper in hybrid cars (42 pounds in standard cars)
- Phones: 16 grams of copper in our cell phones

**Nickel**

- Stainless steel (hospital equipment, in our kitchens)
- Aircraft engines
- Batteries for energy storage and electric vehicles

**Platinum group metals:**

**Cobalt**

- Key element in rechargeable batteries
- Smartphones

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- The leading domestic use for platinum group metals is for catalytic converters that decrease emissions from automobiles.

### **Palladium and Platinum**

- Key elements of many medical and dental instruments
- Electronics

### **Gold**

- Jewelry
- Dental equipment
- Many of our electronics

### **What products will Twin Metals sell to customers?**

1. Copper concentrate
2. Nickel/cobalt concentrate
3. Platinum group metals (PGM) concentrate

### **What happens to the concentrates after they're sold?**

After the concentrates are sold, they would be shipped out in shipping containers for final processing to separate the elemental minerals from the concentrates. Twin Metals is not involved in that part of the process.

### **TMM has stated its tailings will not be acid generating. How does it know?**

There are two common sources of Acid Rock Drainage (ARD) – waste rock stored on the surface that contains ore, and sulfur-bearing tailings. When exposed to air and water, those sources have the potential to create ARD when not managed appropriately. There will be no waste rock on surface at the TMM mine, eliminating one potential source of

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ARD. In addition, because of the geology of the Maturi Deposit, as well as the method TMM will use to mine this resource, tailings produced will be non-acid generating – meaning no ARD. The remaining sulfur left in the tailings does not meet the threshold for acid generation.

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