



# Tamarack Water Alliance

## Talon Tamarack EAW Overview

<https://tamarackwateralliance.org/>

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# The Proposed Tamarack Mine

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- ❖ Talon Metals is a mineral exploration and marketing company registered in the British Virgin Islands with offices in Toronto Canada and Tamarack MN.
  - The Tamarack Project is currently 51% owned by Talon Metals Corp. (Talon), and the remaining owned by Kennecott Exploration Company (Kennecott / Rio Tinto) and is operated by Talon.
  - Located in a wetland area, in the 1855 treaty territory / Anishinaabe lands, near Minnewawa and Big Sandy Lake... Mississippi and Kettle Rivers (St. Croix).
- ❖ Talon plans to build an underground high sulfide nickel-copper mine in coming years.
  - Talon has submitted an Environmental Assessment Worksheet (EAW) in June 2023.
  - <https://files.dnr.state.mn.us/input/environmentalreview/tamarack-nickel/06212023-talon-nickel-tamarack-mining-project-eaw-form.pdf>
- ❖ This NOT an iron mine! Nickel-Copper-Cobalt minerals are bonded to sulfur mined as sulfide ores.
  - When these ores are exposed to air and moisture, a chemical reaction occurs that generates sulfuric acid that migrates into the surrounding environment and, through leaching, releases heavy metals present in the waste rock, pit walls, and tailings basins of mining operations.
  - Tamarack sulfide deposits (and tailings) also contain cobalt and other highly toxic minerals.
  - The sulfuric acid along with dissolved heavy metals released onto the land will seep into the rich aquifers below and then into streams and lakes at levels that are toxic to fish and other aquatic life.
  - All of the water bodies in the Tamarack area are linked by multiple aquifers.

# EAW Scoping

- ❖ **Page 1: “The Project Area is defined by the surface boundary and the underground boundary areas, as shown on Figure 2, and together comprise 447.0 acres.”**
  - “Talon plans to extract ore at a rate of up to 800,000 short tons (2,000 lbs/short ton) per year over an approximately 7- to 10-year period of mine production.”
  - “Ore ... would be transported by railway to an out-of-state processing facility located in North Dakota, which would produce metal concentrate products.”
- ❖ But wait, they have identified nickel resources through drilling in a MUCH bigger area.

Thus the scope should include the entire area of mineralization as it would be subject to mining from this main surface location.

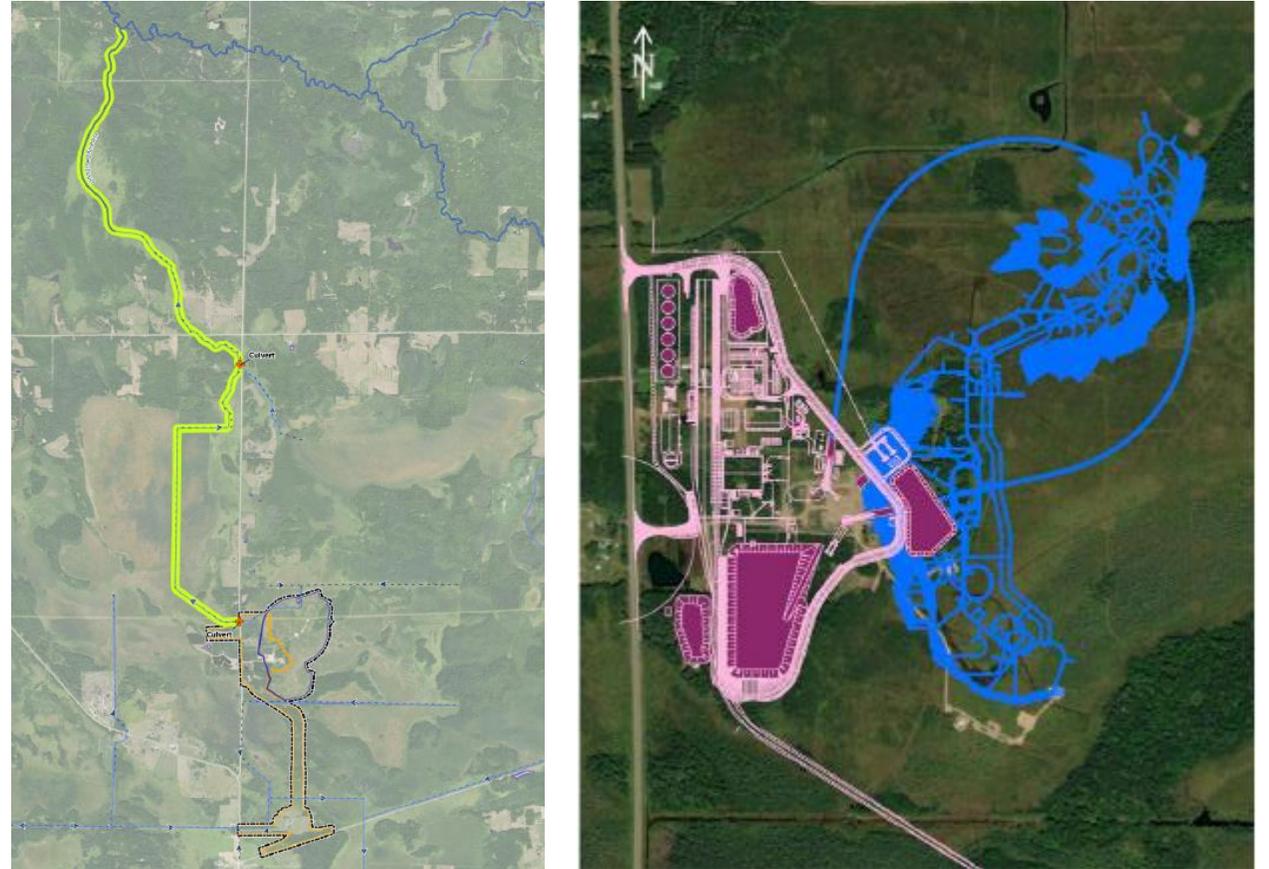
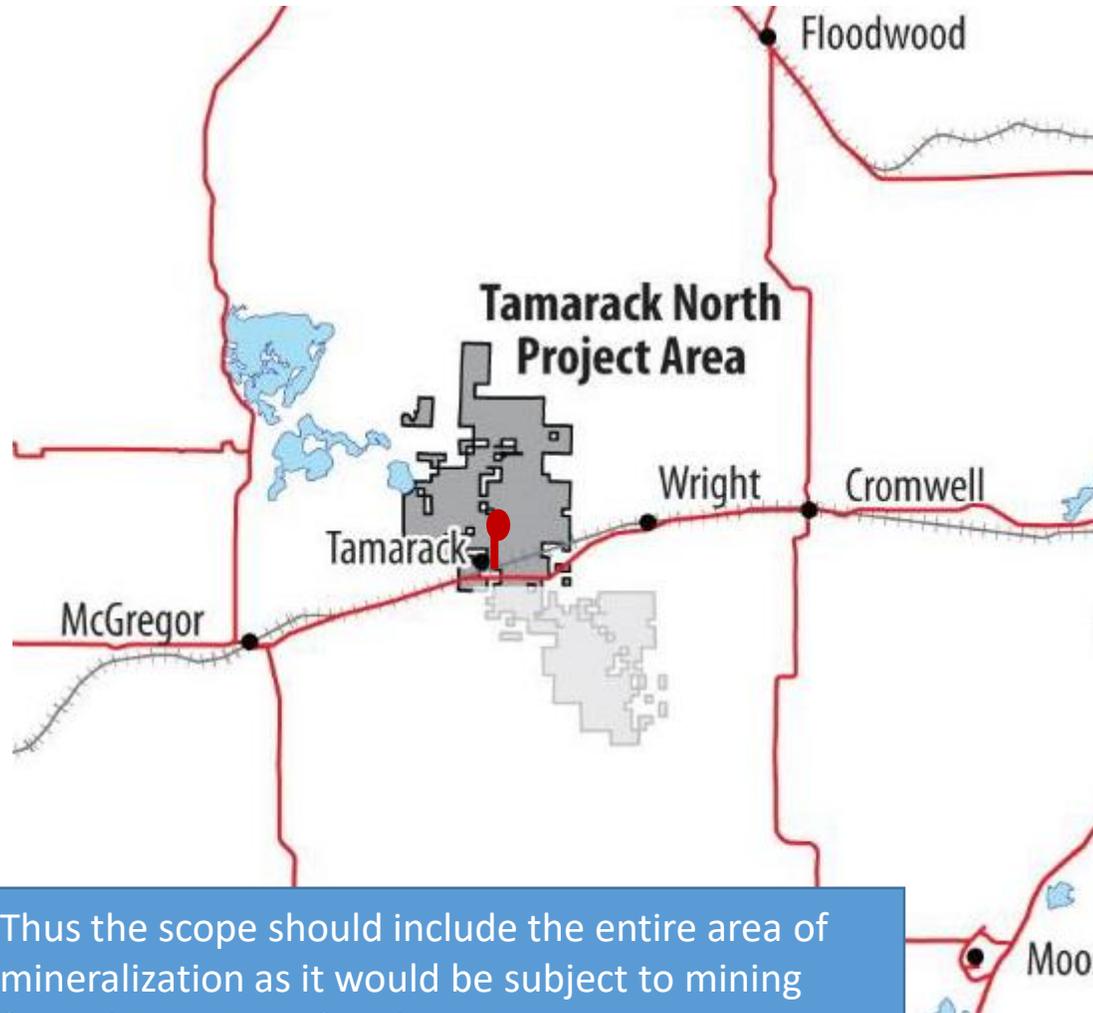


Figure 2

# Mining – Impacted Areas



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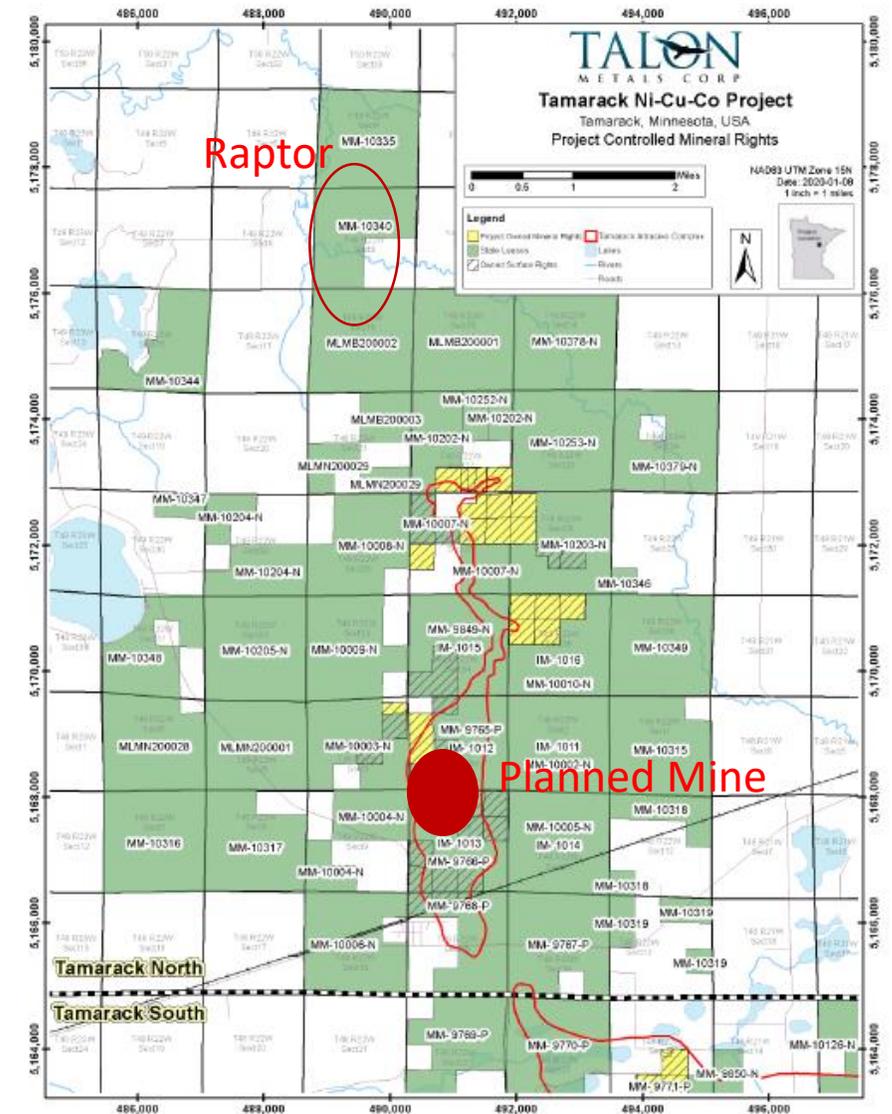


Figure 4-2: Tamarack North Project Mineral and Surface Rights

# Air / Venting

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- ❖ **Page 13:** “Fans and ducting are used to remove dust and blasting gases such as CO and NO<sub>2</sub> from the immediate area, and the primary mine ventilation system would then convey the gases to the mine exhaust circuit. Prior to release, the exhaust air would undergo a filtration or scrubbing process **to reduce the amount of suspended dust and particulates**”
  - Although they say they are venting NO<sub>2</sub> (Nitrogen Dioxide) they do not seem to filter for this substance (from the EPA <https://www.epa.gov/no2-pollution/basic-information-about-no2> ... harmful when inhaled due to effects on the respiratory system.)
  - Development rock storage areas appear not to be lined nor do they have wind/air mitigation to prevent sulfur wind dispersal (Development rock contains varying amounts of sulfur ... Page 17).
  - For this sulfur containing development rock, crushers will be used which also creates toxic dust.
    - Page 19: “The development rock, overburden, or aggregate would be fed **into a crusher** to produce the smaller particles needed to produce the CRF mix”

- Air filtration systems must filter out a very high percentage of toxic gases and materials given the high toxic load of a high sulfide mine
- In addition, dust mitigation must be applied to sulfide bearing storage areas.
- Storage are **MUST BE LINED** (double lined with a leak detection system)

# Onsite Development Rock

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- ❖ Onsite development rock storage area at the Michigan Eagle mine.
- ❖ Note there is a large variation in rock size from very large (which will need to be broken for rail transport) to quite small – sand like particles.
- ❖ Run of mine ore will likely need to be broken up for transport
- ❖ Despite press release statements – crushers WILL BE USED on high sulfide rocks creating more dust and releasing additional toxic materials



# Water

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- ❖ Page 50: “ ... preliminary estimate of mine inflow is provided here, based on limited bedrock hydrogeological information available in 2020.”
  - That is to say, Talon still estimates “roughly” 2.3 Million gallons a day of water pumped from the mine / aquifers ... but its still a “preliminary” number based on drill hole data from 2020 and earlier (detailed in the 2021 PEA)
  - Note that this 2020 estimate DID INCLUDE EFFECTS OF GROUTING (from their 2021 PEA) but now Talon denies this
  - **Are the models they are using to estimate this water flow accurate in this geology?** (there are no underground mines in Minnesota much less in the geology of this region).
  - They did not account for the effects of blasting (multiple times a day) on the effect of water inflow.

Mine inflow water seems to be a very rough guess and does not include other mining operations such as blasting

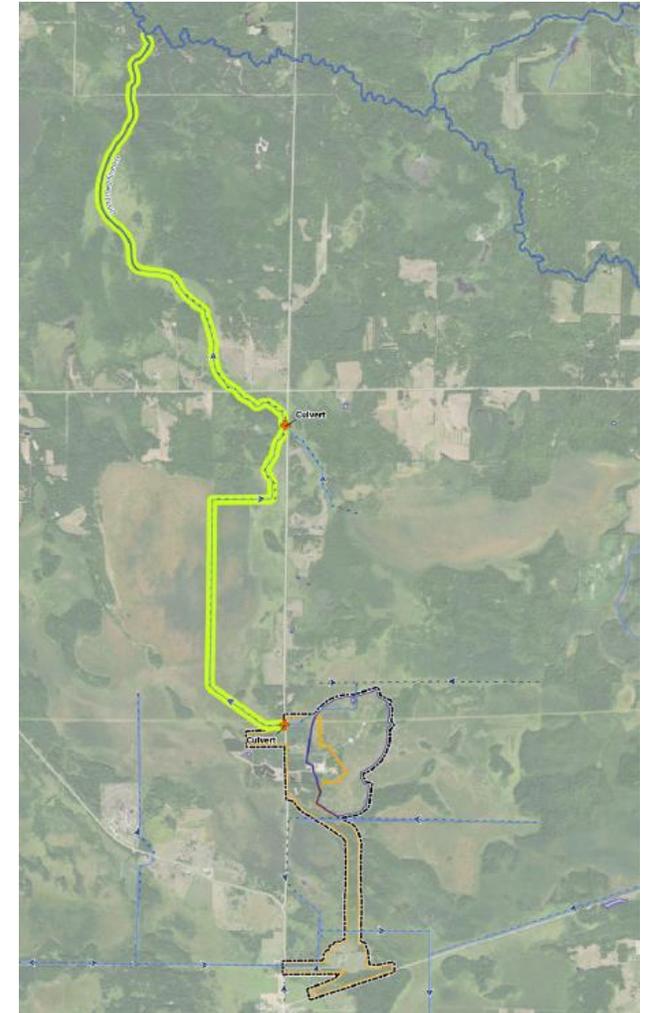
NO DATA is provided as to the affect on surface water levels (wells, lakes, wetlands) despite evidence from the Michigan Eagle Mine where large (~1.7') drops in surface water levels have been measured with only 5% of the pumping Talon claims. Extensive studies will be required!

# Water (2)

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- ❖ Page 22: “Contact water would be treated at the water treatment plant. The preferred option actively being explored is reverse-osmosis (membrane filtration).”
  - Water is stored temporarily in a set of large water tanks on site
  - Then released to a “ditch” that flows north toward Big Sandy
  - But wait ... what happens when the “ditch” freezes over in the winter?
- ❖ If the levels of water are higher (which may be quite likely) the tanks and water filtration will be inadequate and a great deal of polluted water will be drained into the environment (toward Big Sandy and surrounding lakes and wetlands).
- ❖ Wild rice is very sensitive to pollution levels, particularly sulfides.
- ❖ No studies presented on how “sterile” water affects the wetland chemistry affecting the environment

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# Blasting

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- ❖ **Page 13:** “Blasting – The explosives are initiated to break the rock.” ... “The blast holes are loaded with explosives, consisting of either ANFO (**ammonium nitrate** and fuel oil) in prill (pellet) form, or a water-resistant ANFO emulsion (explosive mixture). “
  - Blasting would normally occur at shift boundaries when the mine is evacuated of personnel – 2-3 times a day ... potentially **over 10,000 blasts** in a 10 year life of mine period
  - No shake table tests were presented – over time, constant shaking of the ground will cause foundations to fail / sink causing significant damage to nearby structures.
- ❖ Parts of Oklahoma now have the same earthquake risk as California — and a new study found a scarily direct link to fracking (<https://www.businessinsider.com/earthquakes-fracking-oklahoma-research-2018-2>)
  - A large increase in small tremors (similar to the blasting) due to fracking have resulted in significant road and building damage.
- ❖ Talon has produced NO studies to support their claim that blasting is “no problem”

Blasting may occur anytime of day or night, 2-3 times a day, disrupting life and likely causing building damage over time

# Rail Transport

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- ❖ **Page 20:** “An outgoing shipment of approximately 30-120 railcars would be collected by the BNSF approximately every 2-7 days. The Ore and Class 3 development (high sulfide) rock would be transported by railway from the Project Area to a stand-alone processing facility with a concentrator located off-site.”



Normal “hopper” style rail cars SHOULD NOT be used as sulfide particles (“fines”) will fall through the hopper doors on the bottom



Gondola cars may work BUT many gondola cars still have openings in the bottom that can leak materials. These have to be flipped upside down to empty since there is no bottom hatch. This will require a 'rotary car dumper' in North Dakota.

# Rail Transport (2)

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- ❖ In addition, since mine conditions are “very wet” (water is sprayed after a blast as part of dust mitigation and to clear loose rock), the ore will be wet.
- ❖ Thus when transported in freezing temperatures over long distance the ore freezes making it impossible to unload from the rail car.

What other chemicals or mitigations will Talon need to deal with rail transport freezing? And what are the environment impacts?

# Other Impacts

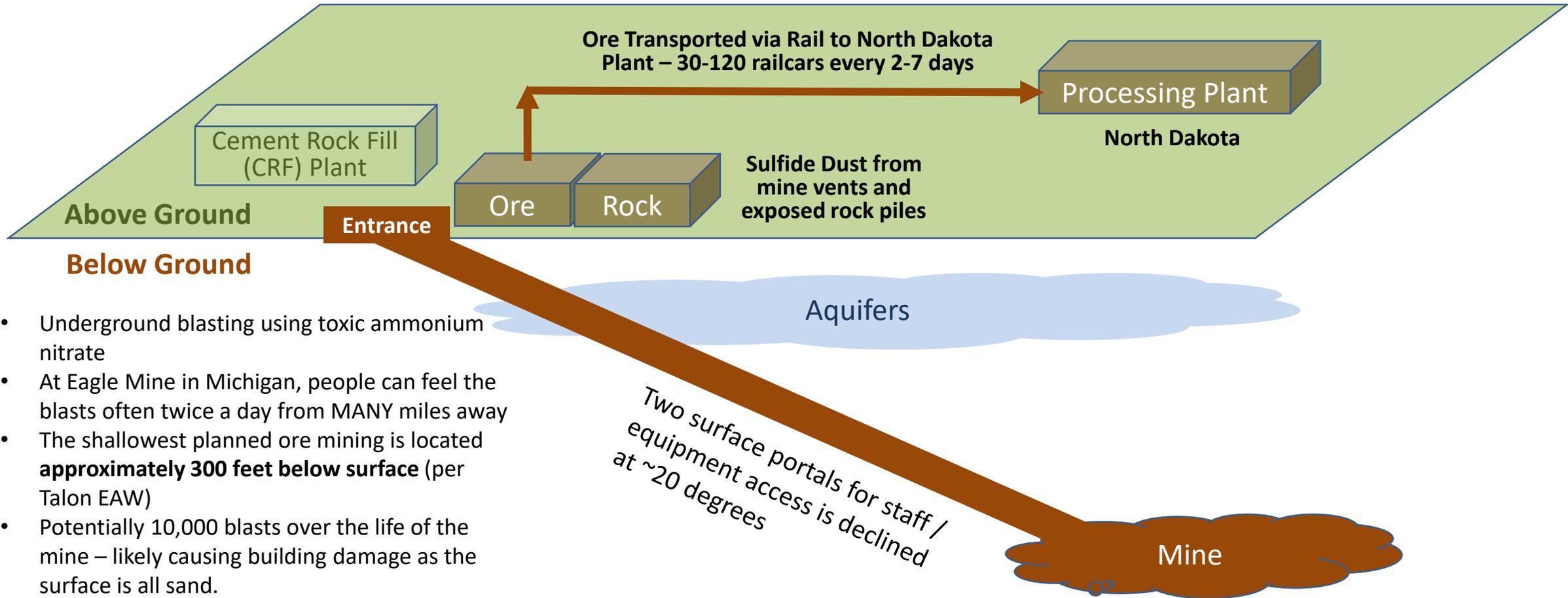
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**Page 5: “...some degree of construction in the wetlands is unavoidable in order to connect the existing railway to the main mine site. Areas of shallower peat would be excavated and replaced with fill material, while limited areas of deeper peat would require installation of pilings.”**

# How the Mine Works

## BASIC OPERATION

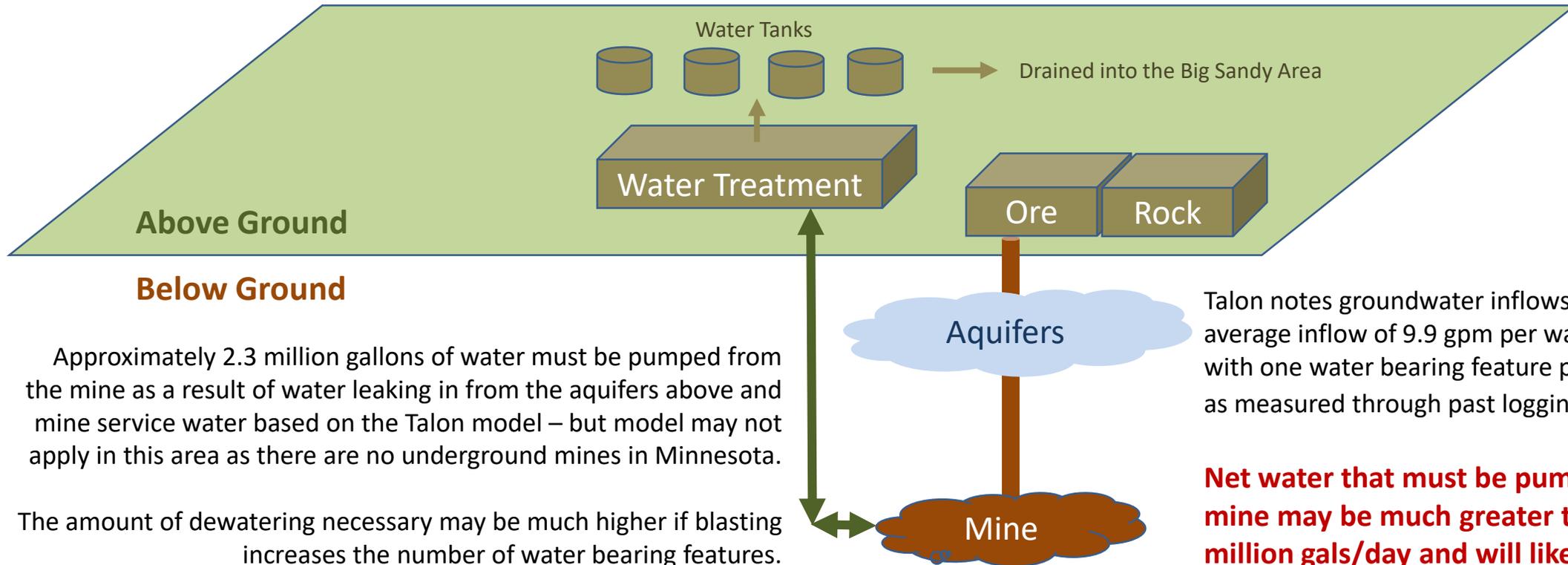
- Blast out stopes to collect ore
- Bring ore to the surface and store
- Ship ore over rail (**30-120 railcars every 2-7 days**) to North Dakota



- Underground blasting using toxic ammonium nitrate
- At Eagle Mine in Michigan, people can feel the blasts often twice a day from MANY miles away
- The shallowest planned ore mining is located **approximately 300 feet below surface** (per Talon EAW)
- Potentially 10,000 blasts over the life of the mine – likely causing building damage as the surface is all sand.
- Blasts can open new cracks in the bedrock increasing water quantities that must be pumped

# Water Balance Details

1. From page 228 of the 2021 PEA
2. Numbers vary from year to year



**Above Ground**

**Below Ground**

Approximately 2.3 million gallons of water must be pumped from the mine as a result of water leaking in from the aquifers above and mine service water based on the Talon model – but model may not apply in this area as there are no underground mines in Minnesota.

The amount of dewatering necessary may be much higher if blasting increases the number of water bearing features.

**This water is sulfide contaminated water that must be filtered – Talon plans a membrane based filter, storage tanks, then discharge into a ditch that flows into the Big Sandy area. No studies provided to assess the environmental damage.**

Talon notes groundwater inflows are based on an average inflow of 9.9 gpm per water bearing feature with one water bearing feature per 216m of drill data as measured through past logging.

**Net water that must be pumped from the mine may be much greater than the 2.3 million gals/day and will likely affect aquifer, lake and well levels. At Eagle Mine monitor point QAL023B, the mean water level readings are often 1.7 feet (ft) below the calculated minimum background baseline level - pumping only 5% of Talon Mine levels**

**Blasting can open new fissures increasing pumping requirements**

**Table 8: Summary of Required Permits/Approvals**

Unit of Government	Type of Permit/Approval	Status
United States Army Corps of Engineers	Clean Water Act Section 404 Permit Includes Section 106 Consultation with the State Historic Preservation Office and Section 7 Consultation with the U.S. Fish and Wildlife Service (USFWS)	Pending submittal
United States Fish and Wildlife Service	Section 7 determination of effect concurrence	Pending submittal; issued with Section 404 Permit
United States Environmental Protection Agency	Underground Injection Control Permit	Pending submittal
Minnesota Department of Natural Resources (DNR)	Permit to Mine	Pending submittal
DNR	Natural Heritage Information System Protected Species Review	Pending submittal
DNR	Work in Public Waters Permit	Pending submittal
DNR	Water Appropriations Permit	Pending submittal
DNR	Wetland Conservation Act Replacement Plan Approval	Pending Submittal
DNR	License to Cross Public Waters	Pending Submittal
DNR	License to Cross Public Lands	Pending Submittal
DNR	Lease/Easements on Public Lands	Pending Submittal
DNR	Aquatic Vegetation Removal Permit	Pending Submittal
Minnesota Pollution Control Agency (MPCA)	National Pollutant Discharge Elimination System (NPDES) / State Disposal System (SDS) Individual Wastewater Permit	Pending submittal
MPCA	NPDES/SDS Industrial Stormwater General Permit (or combined with Individual Wastewater Permit)	Pending submittal
MPCA	NPDES/SDS Construction Stormwater General Permit	Pending submittal
MPCA	Section 401 Water Quality Certification	Pending submittal; issued with Section 404 Permit
MPCA	Air Permit	Pending submittal

Unit of Government	Type of Permit/Approval	Status
MPCA	Hazardous Waste Generator License	Pending submittal
MPCA	Aboveground Storage Tank Notification	Pending submittal
MPCA	Aboveground Storage Tank Permit	Pending submittal
Minnesota Department of Health (MDH)	Water Supply Well Notification	Pending submittal
Minnesota Department of Transportation (MDOT)	Railroad Warning Signal Operator License	Pending submittal
State Historic Preservation Office (SHPO)	Section 106 concurrence	Pending submittal; issued with Section 404 Permit
Aitkin County	Building Permits	Pending submittal
Aitkin County	Subsurface Sewage Treatment System Permit	Pending submittal

Note: Final determination of needed permits/approvals will be determined as part of the EIS.

## Summary of Permits – Table 8 in EAW

# Talon Mine References

- ❖ All mine related information is taken from the publically available Talon documents
  - TALON 2021 Preliminary Economic Analysis - PEA ([https://talonmetals.com/wp-content/uploads/2021/02/Talon-Tamarack-PEA3\\_2021.pdf](https://talonmetals.com/wp-content/uploads/2021/02/Talon-Tamarack-PEA3_2021.pdf))
  - Talon 2022 PEA ([https://talonmetals.com/wp-content/uploads/2022/11/Final NI43101 Report Talon TamarackN 20221102.pdf](https://talonmetals.com/wp-content/uploads/2022/11/Final_NI43101_Report_Talon_TamarackN_20221102.pdf))
  - Talon Environmental Assessment Worksheet submitted in June 2023 - <https://files.dnr.state.mn.us/input/environmentalreview/tamarack-nickel/06212023-talon-nickel-tamarack-mining-project-eaw-form.pdf>

# Documented Health Risks of Sulfide Mining in Minnesota

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- Sulfide Mining and Human Health in Minnesota  
[https://pubs.royle.com/publication/?i=352462&article\\_id=2624726&view=articleBrowser](https://pubs.royle.com/publication/?i=352462&article_id=2624726&view=articleBrowser)
- Risks and costs to human health of sulfide-ore mining near the Boundary Waters Canoe Area Wilderness  
<https://www.tandfonline.com/doi/abs/10.1080/10807039.2019.1576026>
- Sulfide-ore mining AND human health in Minnesota - WHERE ARE WE NOW?  
<https://www.savetheboundarywaters.org/sites/default/files/resource-file/MNMedicine2022.pdf>