

## **7.0 COMPARISON OF ALTERNATIVES AND OTHER NEPA CONSIDERATIONS**

### **7.1 INTRODUCTION**

This chapter compares the alternatives and their environmental consequences for the NorthMet Project and Land Exchange. It also addresses irretrievable and irreversible effects, short-term uses versus long-term productivity of the environment, and unavoidable adverse effects. The chapter concludes with a statement on the Co-lead Agencies preferred alternative.

### **7.2 COMPARISON OF ALTERNATIVES**

Alternatives to the NorthMet Project and Land Exchange were screened and analyzed relatively independently of each other because of the different nature of the actions. This section consolidates the connected actions, and summarizes the detailed analysis presented in the respective sections in Chapter 5 and 6. A description of the combined alternatives is provided below, followed by a comparison of the environmental consequences.

#### **7.2.1 Combined Proposed Action**

The combined Proposed Action alternative would involve both the NorthMet Project Proposed Action and Land Exchange Proposed Action as proposed and described in Sections 3.2.2 and 3.3.2, respectively.

The NorthMet Project would involve three major components: a new copper-nickel-PGE Mine Site, a refurbished Plant Site at the former LTVSMC processing plant, and an existing Transportation and Utility Corridor that would connect the Mine Site and Plant Site. There would be three phases lasting approximately 40 years total, with another long-term phase to follow. The first phase would last for approximately 18 months and would include site preparation, refurbishment of some existing buildings, and construction of new facilities and infrastructure. The second phase, which would last approximately 20 years, would include operation of the mine and processing facilities, and blasting, hauling, and processing of the ore rock to be shipped. The third phase would occur after mining and would include infrastructure removal and land reclamation. The long-term phase would involve ongoing site maintenance and active mechanical treatment and monitoring of water at both the Mine Site and Plant Site. The configuration of the NorthMet Project Proposed Action is shown in Figure 3.2-1 in Section 3.2.1. The development of the Mine Site is shown in Figures 3.2-4 through 3.2-9 in Section 3.2.2.1. The Transportation and Utility Corridor is shown in Figure 3.2-20 in Section 3.2.2.2, and development of the Plant Site is shown in Figure 3.2-23 and Figure 3.2-29 in Section 3.2.2.3.

The Land Exchange Proposed Action would involve exchange of a single 6,650-acre (GLO) tract of federal land (encompassing most of the Mine Site) with up to approximately 6,722 acres (GLO) of privately owned, non-federal lands located within five different tracts throughout the proclamation boundary of the Superior National Forest within St. Louis, Lake, and Cook counties of northeastern Minnesota. The location of the federal and non-federal lands is shown in Figure 3.3-1 in Section 3.3.2.

### **7.2.2 Combined Alternative B**

Combined Alternative B would involve the NorthMet Project Proposed Action as described in Section 3.2.2 and summarized above in Section 7.2.1, and the Land Exchange Alternative B as described in Section 3.3.2.

Compared to the Land Exchange Proposed Action, the Land Exchange Alternative B would involve conveying fewer acres of federal lands, approximately 4,901 acres (GLO), for fewer acres of non-federal land, approximately 4,652 acres (GLO) from a single tract (Tract 1). The configuration of the smaller federal parcel is shown in Figure 3.3-2 in Section 3.3.3.2.

### **7.2.3 No Action**

Under the No Action Alternative there would be no NorthMet Project or Land Exchange. Refer to Section 3.2.3.2 and Section 3.3.3.1 for a discussion on the No Action alternative for the respective connected actions.

At the Mine Site, PolyMet would be required under exploration approvals to reclaim surface disturbance associated with exploratory and development drilling activities. Other existing surface uses would be allowed to continue consistent with the Superior National Forest Plan. No further upgrades or new segments would be constructed along the existing power transmission line, railroad, and Dunka Road, which would continue to be used by their private owners. At the former LTVSMC Processing Plant, the land owner, Cliffs Erie would be required to complete closure and reclamation activities required under an existing MDNR- and MPCA-approved reclamation program.

The federal government would not convey federal lands to PolyMet and the USFS would continue managing these lands as has been done in the past. Furthermore, the federal government would not acquire the five tracts of non-federal lands and the lands would remain as private lands.

### **7.2.4 Comparison of Effects**

A summarized comparison of the environmental consequences of the alternatives—as described in Sections 7.2.1, 7.2.2, and 7.2.3—is provided in Table 7.2-1. Refer to the respective sections in Chapter 4 for discussion on the existing conditions and to Chapter 5 for more detail on the environmental consequences.

In comparison to the combined Proposed Action (Section 7.2.1), the combined Alternative B NorthMet Project Proposed Action and Land Exchange Alternative B (Section 7.2.2) would have the same direct effects from the NorthMet Project Proposed Action, but would convey fewer lands through the Land Exchange, resulting in smaller net gains in environmental resources. The No Action Alternative would not directly affect the existing environment and management of these lands would continue in accordance with their current conditions. Compared to the combined Proposed Action and combined Alternative B, the No Action Alternative would likely result in active but slower and potentially less comprehensive management of water from the existing LTVSMC Tailings Basin. There would be no other measurable effect on other resources compared to their existing conditions.

**Table 7.2-1 Comparison of Environmental Consequences by Alternative**

<b>Resource</b>	<b>Combined Proposed Action</b>	<b>Combined Alternative B</b>	<b>No Action Alternative</b>
<b>Land Use</b>	<ul style="list-style-type: none"> <li>• No effects on land use that would require changes in ordinances or comprehensive forest plans</li> <li>• Decrease in federal land within the NorthMet Project would reduce 1854 Ceded Territory at the NorthMet Project area, but would be replaced with equal acreage through land exchange</li> </ul>	<ul style="list-style-type: none"> <li>• Mostly similar effects as Combined Proposed Action with fewer federal acres removed from the 1854 Ceded Territory at Mine Site from the smaller land exchange</li> </ul>	<ul style="list-style-type: none"> <li>• No effect</li> </ul>
<b>Water Resources</b>	<ul style="list-style-type: none"> <li>• Mercury: Discharge 0.5 ng/L (Great Lakes Initiative discharge standard = 1.3 ng/L)</li> <li>• Sulfate: Discharge below MPCA wild rice standard</li> <li>• 99.9% water discharge would be treated to below standards</li> <li>• Water use: Water would be taken from Colby Lake to augment flows to streams and wetlands outside of the Tailings Basin containment system</li> </ul>	<ul style="list-style-type: none"> <li>• Same as Combined Proposed Action</li> </ul>	<ul style="list-style-type: none"> <li>• Continuation of sulfate discharge from former LTVSMC site (subject to Consent Decree)</li> <li>• Continuation of elevated sulfate levels from existing discharges</li> <li>• Seepage water quality from the existing LTVSMC Tailings Basin would be expected to improve over time as a result of the Consent Decree and natural attenuation of contaminants.</li> </ul>

<b>Resource</b>	<b>Combined Proposed Action</b>	<b>Combined Alternative B</b>	<b>No Action Alternative</b>
<b>Wetlands (includes floodplains)</b>	<ul style="list-style-type: none"> <li>• 912.5 acres: Direct loss of wetlands at NorthMet Project area</li> <li>• 7,228.1 acres: Indirect effects on wetlands at NorthMet Project</li> <li>• 1,629.4 acres of compensatory off-site wetlands</li> <li>• 511.1 acres: Net gain of federal administered wetlands (acquired land exchange tracts plus off-site mitigation minus federal lands transferred at NorthMet Project)</li> <li>• 1,401.0 acres: Direct loss of floodplains (through land exchange)</li> </ul>	<ul style="list-style-type: none"> <li>• Same direct and indirect effects of on- and off-site mitigation as Combined Proposed Action</li> <li>• 74.0 acres: Gain of wetlands from fewer lands acquired through land exchange</li> <li>• 1,036.7 acres: Loss of floodplains from fewer acres transferred out of federal ownership at NorthMet Project</li> </ul>	<ul style="list-style-type: none"> <li>• No change in wetland or floodplain acreage</li> </ul>
<b>Vegetation (includes habitat and Special Status Species)</b>	<ul style="list-style-type: none"> <li>• 4,016.3 acres: Loss of vegetation</li> <li>• 579.6 acres: Net gain of vegetation through added federally-administered wetlands through compensatory mitigation</li> </ul>	<ul style="list-style-type: none"> <li>• Same direct loss of vegetation as Combined Proposed Action</li> <li>• 173.6 acres: Net gain of vegetation through added federally-administered wetlands through compensatory mitigation</li> </ul>	<ul style="list-style-type: none"> <li>• No effect to vegetation</li> </ul>

<b>Resource</b>	<b>Combined Proposed Action</b>	<b>Combined Alternative B</b>	<b>No Action Alternative</b>
<b>Wildlife (includes Special Status Species)</b>	<ul style="list-style-type: none"> <li>• 4,016.3 acres: Loss of wildlife habitat</li> <li>• 579.6 acres: Net gain of wetland habitat (see Vegetation above)</li> <li>• Localized population decrease and fragmentation of critical habitat to the Canada lynx</li> <li>• Low potential for incidental take resulting from vehicular collisions due to increased NorthMet Project Proposed Action-related traffic</li> </ul>	<ul style="list-style-type: none"> <li>• Same as Combined Proposed Action</li> <li>• 173.6 acres: Net gain of vegetation through added federally-administered wetlands through compensatory mitigation</li> </ul>	<ul style="list-style-type: none"> <li>• No effect on wildlife</li> </ul>
<b>Aquatic Species</b>	<ul style="list-style-type: none"> <li>• Decrease in mercury loading (varies by modeled location)</li> </ul>	<ul style="list-style-type: none"> <li>• Same as Combined Proposed Action</li> </ul>	<ul style="list-style-type: none"> <li>• Mercury loading at current levels</li> </ul>

<b>Resource</b>	<b>Combined Proposed Action</b>	<b>Combined Alternative B</b>	<b>No Action Alternative</b>
<b>Air Quality (includes GHGs and Global Climate Change)</b>	<ul style="list-style-type: none"> <li>• Increased emissions of criteria air pollutants, but below NAAQS standards</li> <li>• 77,379 tpy emissions of GHGs</li> <li>• Amphibole Mineral Fibers: Below USEPA PSD standards through use of BACT-like design</li> <li>• The NorthMet Project does not affect Class I visibility or regional haze</li> </ul>	<ul style="list-style-type: none"> <li>• Same as Combined Proposed Action</li> </ul>	<ul style="list-style-type: none"> <li>• Continued air (fugitive dust) effects at LTVSMC site until remediation occurs under Consent Decree</li> </ul>
<b>Noise and Vibration</b>	<ul style="list-style-type: none"> <li>• Added noise emissions and vibration; however, effects on nearest receptors would be below applicable standards</li> </ul>	<ul style="list-style-type: none"> <li>• Same as Combined Proposed Action</li> </ul>	<ul style="list-style-type: none"> <li>• No effects</li> </ul>

Resource	Combined Proposed Action	Combined Alternative B	No Action Alternative
<b>Cultural Resources</b>	<ul style="list-style-type: none"> <li>• Adverse effects on <i>Messabe Widjiu</i> (Laurentian Divide)</li> <li>• Effects, but no adverse effects, on Sugarbush</li> <li>• Adverse effects on Indian Trail from Lake Vermilion to Beaver Bay Corridor</li> <li>• Adverse effects on Erie Mining Company Concentrator Building</li> <li>• Effects, but no adverse effects, on Erie Mining Company Railroad Mine and Plant Track</li> <li>• Potential to affect 1854 Treaty resources, but unknown</li> </ul>	<ul style="list-style-type: none"> <li>• Same as Combined Proposed Action</li> </ul>	<ul style="list-style-type: none"> <li>• No effects</li> </ul>

<b>Resource</b>	<b>Combined Proposed Action</b>	<b>Combined Alternative B</b>	<b>No Action Alternative</b>
<b>Socioeconomics (includes Environmental Justice)</b>	<ul style="list-style-type: none"> <li>• Up to 500 new direct jobs (maximum during construction), plus additional indirect and induced jobs</li> <li>• Millions of dollars revenue for State of Minnesota and federal taxes</li> <li>• Environmental Justice (Native American populations) affected by changes in subsistence uses and potential increased living costs</li> </ul>	<ul style="list-style-type: none"> <li>• Same as Combined Proposed Action</li> </ul>	<ul style="list-style-type: none"> <li>• No effects</li> </ul>
<b>Recreation and Visual Resources</b>	<ul style="list-style-type: none"> <li>• Net gain of recreational land on acquired tracts through land exchange</li> <li>• Visual effects would occur, but would not exceed USFS standards</li> </ul>	<ul style="list-style-type: none"> <li>• Fewer federal lands disposed at NorthMet Project Mine Site</li> <li>• Remaining federal lands at Mine site would not have public access</li> <li>• Fewer acres acquired through land exchange</li> <li>• Same visual resources effects as Combined Proposed Action</li> </ul>	<ul style="list-style-type: none"> <li>• No effects</li> </ul>



<b>Resource</b>	<b>Combined Proposed Action</b>	<b>Combined Alternative B</b>	<b>No Action Alternative</b>
<b>Wilderness and Special Designation Areas</b>	<ul style="list-style-type: none"> <li>• No effects on Wilderness or Special Designation Areas</li> <li>• The air quality of the BWCAW is unaffected by the project</li> </ul>	<ul style="list-style-type: none"> <li>• Same as Combined Proposed Action</li> </ul>	<ul style="list-style-type: none"> <li>• No effects</li> </ul>
<b>Hazardous Materials</b>	<ul style="list-style-type: none"> <li>• Potential effects from spills and use of explosives during operations</li> </ul>	<ul style="list-style-type: none"> <li>• Same as Combined Proposed Action</li> </ul>	<ul style="list-style-type: none"> <li>• No effects</li> </ul>
<b>Geotechnical Stability</b>	<ul style="list-style-type: none"> <li>• Waste rock stockpiles, Tailings Basin, and Hydrometallurgical Residue Facility would be constructed in accordance with applicable State of Minnesota standards</li> <li>• Monitoring and adaptive management would maintain geotechnical stability</li> </ul>	<ul style="list-style-type: none"> <li>• Same as Combined Proposed Action</li> </ul>	<ul style="list-style-type: none"> <li>• No effects</li> </ul>

### **7.3 OTHER NEPA CONSIDERATIONS**

In addition to disclosure of direct, indirect, and cumulative effects, NEPA requires that federal agencies identify whether, and to what extent, the proposed action causes irreversible or irretrievable commitments of resources and considers the short-term use of the environment versus maintenance and enhancement of long-term productivity (40 CFR 1502.16). Each of these considerations is explained and disclosed below and the resultant unavoidable adverse effects are described above in Section 7.2.4.

#### **7.3.1 Irreversible or Irretrievable Commitment of Resources**

Irreversible commitments of resources are those that involve permanent loss because the affected resource cannot be returned to its previous condition (e.g., mined ore or wetlands that would be permanently converted to tailings piles). Irretrievable commitments of resources are more temporary in nature because the environment can be returned to its previous state through reclamation and restoration activities (e.g., wetlands that would be restored or former facilities that would be removed and the land recontoured and replanted per the reclamation plan).

The construction and operation of the NorthMet Project Proposed Action would result in the irreversible loss of approximately 225 million tons of base and precious metal ore. Mining activities would remove 912.5 acres of wetlands that would be permanently lost. Through on-site restoration and off-site compensatory mitigation, these would be eventually replaced by the on-site restoration of 101.8 acres and 1,629.4 acres of wetlands, respectively. The reclamation of on-site wetlands would be considered an irretrievable commitment since it would restore wetlands temporarily lost through mining activities.

Other resources could also be irreversibly lost by the NorthMet Project Proposed Action. For example, changes in the viewshed from the creation of new tailings piles and basins would permanently alter visual resources. While cultural resources may be adversely affected, irreversible commitments would be minimized through avoidance. Those cultural resources that cannot be avoided through mitigation planning and coordinated with the Tribes and the State Historic Preservation Officer

For air quality, there would be temporary increases in NAAQS criteria pollutants, which would only last the life of the mine. Water quality would be affected, but would not result in new exceedances in water quality standards. These would be considered irretrievable commitments due to their temporary nature.

The federal lands may contain natural resources culturally important to tribal entities, including access to the land itself, which would be irreversibly lost following the proposed Land Exchange Proposed Action and conversion of the land from public to private ownership.

#### **7.3.2 Short-Term Uses versus Long-Term Productivity of the Environment**

As a result of the effects from the NorthMet Project Proposed Action, the productivity of the land and other resources may be affected for a longer period of time. This portion of NEPA recognizes that short-term uses and long-term productivity of the environment are linked, and that opportunities acted upon have corollary opportunity costs in relation to forgone opportunities and productivity that could have continuing effects well into the future.

The construction and operation of the NorthMet Project Proposed Action would cause short-term effects on air, noise, and visual resources during the 20-year life of the mine. Additionally, there may be potential short-term effects on wetlands from time delays between the loss of existing wetland resources and the development of new, viable wetlands with similar functions. During construction and operation of the mine, air pollutant concentrations would be higher throughout the study area than they are currently, but below applicable air quality standards. Once mining and reclamation are completed, the pollutant concentrations would return to pre-mining levels. The noise levels in the area, while below standards, would increase during operation of the mine. However, post-closure, the noise levels would return to pre-mining levels. The visual effects from the NorthMet Project would be most noticeable during year 11, when the Category 2/3 Stockpile and Category 4 Stockpile would be at their maximum heights, and year 12, when the Category 1 Stockpile would reach its maximum height. Additionally, there would be short-term effects on visual resources from fugitive dust and night-lighting during operations. Long-term visual effects would be landform changes as a result of mining activities.

The Land Exchange would result in the permanent loss of the federal lands for mining purposes, which would be offset by the long-term increased productivity of the non-federal lands as they would be managed under the Forest Plan. As a result of the Land Exchange, there would be no effects as a result of short-term use of aquatic species, cultural resources, vegetation, wildlife, water resources, air resources, wetlands, or recreational and visual resources.

The NorthMet Project Proposed Action and Land Exchange Proposed Action would remove 6,150 acres at the mine site from Forest Service administration and management under the Superior National Forest Land and Forest Management Plan. Currently, the mine site is managed under the SNF Plan as General Forest – Longer Rotation (6,143 acres) and as General Forest (355 acres). If the land were exchanged, the long-term productivity of the federal lands at the mine site would be lost to timber production and other forest uses for the short-term use as a mine. This would represent an unquantified opportunity cost in which the lands and resources could not be used for forest purposes. Under the Combined NorthMet Project Proposed Action and Land Exchange Alternative B would result in 4,397 acres lost under General Forest – Longer Rotation management and 355 acres under the General Forest management category.

### **7.3.3 Unavoidable Adverse Effects**

Regardless of the inclusion of all reasonable mitigation, some effects may not be avoided. For example, the NorthMet Project Proposed Action would utilize technologies to mitigate effects on water quality, which have been demonstrated through modeling to meet applicable water quality standards. However, effects on water quality would remain after all reasonable mitigation measures have been applied.

After the implementation of mitigation measures that have been built into the design, the NorthMet Project Proposed Action would have unavoidable adverse effects on wetlands, vegetation, wildlife, air quality, noise and vibration, visual resources, cultural resources, water resources, and aquatic species. Unavoidable direct effects on surface features such as wetlands, vegetation and wildlife resources would be offset by gains through off-site mitigation (wetlands) and through lands acquired through the Land Exchange. Unavoidable noise and vibration, air, and water emissions from the NorthMet Project Proposed Action would affect the existing conditions, but would not trigger new exceedances of relevant standards and would result in comparatively small cumulative increases to existing levels. The residual practical effects of the

Land Exchange would be the loss of federal land, which would be used for the NorthMet Project, and the gain of non-federal lands.

#### **7.4 PREFERRED ALTERNATIVE**

Consistent with the CEQ regulations, the federal Co-lead Agencies are required to identify a preferred alternative in DEISs, if one exists. In addition, agencies may defer the identification of the preferred alternative until the FEIS if another law “prohibits the expression of such a preference” (40 CFR 1502.14(e)). The USFS has considered this requirement and has determined that, at this time, the agency has not chosen a preferred alternative. The USACE has determined it cannot identify a preferred alternative until the FEIS. The Least Environmentally Damaging Practicable Alternative would be determined in accordance with CWA Section 404 (b)(1) Guidelines.

No similar requirement to identify a preferred alternative exists for the MDNR under state law.

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