

NorthMet Mine and Ore Processing Facilities Project Draft Scoping Decision

1.0 INTRODUCTION AND PURPOSE

1.1 BACKGROUND

The Minnesota Department of Natural Resources (DNR) in with co-operation of the United States Army Corps of Engineer (USACE) and the United States Forest Service (USFS) will prepare a joint state and federal Environmental Impact Statement (EIS) for the NorthMet Mine and Ore Processing Facilities Project (NorthMet) proposed by PolyMet Mining Corporation to extract copper, nickel, cobalt, and precious metals. The joint EIS will allow evaluation to the NorthMet project in accordance with the National Environmental Policy Act (NEPA; 42 U.S.C. §§ 4321-4347), and Minnesota Environmental Policy Act (MEPA; Minn. Stat. Ch. 116D). The NorthMet mine is proposed approximately 6 miles south of the town of Babbitt while the ore processing facility is proposed at a currently inactive taconite processing facility, formerly owned and operated by LTV and now owned by Cliffs Erie, located 5 miles north of the town of Hoyt Lakes, all of which is located in St. Louis County, Minnesota.

The proposed project includes open pit mining operations with ore hauled to the processing facility on a largely existing rail line owned by Cliffs Erie. Ore would be processed at a refurbished and modified taconite processing facility. The hydrometallurgical process of flotation and autoclave leach facilities would be used with refurbished crushing and grinding facilities to produce copper metal and precipitates of nickel, cobalt, palladium, platinum, and gold. Precipitates are proposed for shipment off-site to third party treatment. The flotation process will generate flotation tailings that are proposed for disposal on top of a portion of an existing taconite tailings disposal facility. The hydrometallurgical process would generate some waste residue that is proposed for disposal in lined cells on top of the existing taconite tailings adjacent to the area proposed for disposal of flotation tailings.

1.2 SELECTION OF APPROPRIATE ENVIRONMENTAL REVIEW DOCUMENT

The EIS is mandatory for this project pursuant to Minnesota Rules part 4410.2000 subpart 2; the rule directs that an EIS shall be prepared if the project meets or exceeds the thresholds of any of the EIS categories listed in part 4410.4000. Part 4410.4400 identifies metallic mineral mining and processing under subpart 8 as requiring preparation on an EIS. The EIS will meet applicable requirements of Minnesota Rules part 4410.0200 to 4410.7800 (MEQB Rules) that govern the Minnesota Environmental Review Program. The DNR is the responsible governmental unit (RGU) under MEPA. The DNR will engage the services of a consultant to assist in EIS preparation, however the DNR will retain responsibility for EIS content.

The USACE received an application from the PolyMet Corporation to discharge fill material in waters of the U.S., including wetlands to develop the NorthMet project. The USACE has determined that its action on the permit would be a major federal action that could significantly affect the quality of the human environment, requiring the preparation of a Federal EIS pursuant

to the National Environmental Policy Act (NEPA) (42 U.S.C. §§ 4321-4347) and its implementing regulations (40 C.F.R. parts 1500-1508).

The USACE is serving as co-lead agency in preparation of the EIS with the DNR. Although the mine site for the NorthMet project is located on USFS land, there is an existing mineral lease for the deposit. The USFS has determined that they do not have a federal action if the NorthMet project is developed in compliance with the existing conditions of the lease. The USFS is serving as cooperating agency in the EIS preparation with the USACE and DNR.

1.3 PURPOSE AND NEED OF THE PROJECT

The primary purpose of the NorthMet mining operation is to provide copper, precious metal, and nickel-cobalt concentrates for sale to the world market. Over the project lifetime, PolyMet projects that the operation will produce approximately 3.2 million tons of copper, 860,000 tons of nickel, 9.3 million ounces of palladium, and 2.6 million ounces of platinum.

PolyMet anticipates that optimized mining and processing operations would involve extracting and processing 32,000 tons of NorthMet ore each day. All mining activities must be conducted and sequenced as efficiently and cost-effectively as possible. In this way, the production of copper and other metals can remain competitive, not only within the United States, but also in the worldwide metals market.

PolyMet would strive to operate the NorthMet project in a manner that is efficient and cost-effective, and that minimizes impacts to the environment. PolyMet projects that between 490 and 600 long-term jobs would be created in the Babbitt and Hoyt Lakes area, in addition to several hundred jobs during the one-year construction phase.

1.4 THE SCOPING PROCESS

The Draft Scoping Decision Document is a companion to the Scoping Environmental Assessment Worksheet (EAW) prepared for the project. The purpose of the Draft Scoping Decision Document is to identify those project alternatives and environmental impact issues that will be addressed in the EIS. The Draft Scoping Decision Document also presents a tentative schedule of the environmental review process.

Public review and comment on the Draft Scoping Decision Document will be conducted as prescribed MEQB rules part 4410.2100. After public review and comment the DNR and USACE will consider the comments received and develop a Final Scoping Decision Document. A notice of availability will be published in the EQB monitor for this document.

2.0 PROJECT ALTERNATIVES

The MEQB rules require that an EIS include at least one alternative of each of the following types, or provide an explanation of why no alternative is included in the EIS (*Guide to Minnesota Environmental Review Rules*, page 12): alternative sites, alternative technologies,

modified designs or layouts, modified scale or magnitude, and alternatives incorporating reasonable mitigation measures identified through comments received during the EIS scoping and draft EIS comment periods. The alternative of no action shall be addressed

Minnesota Rules part 4410.2300, subpart G directs that an alternative may be excluded for the analysis in the EIS if “it would not meet the underlying need for or purpose of the project, it would likely not have any significant environmental benefit compared to the project as proposed, or another alternative, of any type, that will be analyzed in the EIS would likely have similar environmental benefits but substantially less adverse economic, employment, or sociological impacts.” Selection or dismissal of alternatives will be documented in the EIS.

2.1 PROPOSED ALTERNATIVE

The EIS will describe the proposed project and the potential environmental and socioeconomic effects outlined in Section 3.0.

2.2 NO ACTION ALTERNATIVE

The EIS will describe the expected condition if the proposed project is not developed, with respect to the potential environmental and socioeconomic effects outlined in Section 3.0. This alternative will consider the processing of the same amounts of metals and precipitates at existing facilities due to consistent market demand of metals.

2.3 SITE ALTERNATIVES

The MEQB rules allow the RGU to exclude alternative sites if other sites do not have any significant environmental benefit compared to the project as proposed, or if other sites do not meet the underlying need and purpose of the project. The MEQB’s Guide to Minnesota Environmental Review Rules lists a number of factors for the RGU to consider when deciding whether alternative sites would meet the underlying need for or purpose of the project.

The DNR and USACE do not propose to evaluate alternative mine pit or processing plant sites for this project. An alternative mine site would not meet the underlying need or purpose of the project. The mineralization of the desired elements within a geologic deposit dictates the location of the mine. An alternative processing plant site may not be feasible or achievable in the time frame of the project.

The EIS will evaluate the suitability and benefits of alternative tailings basin and waste rock stockpile locations. Although specific alternatives have not yet been identified the following options are under consideration.

In-pit Waste Rock Disposal– Sub-aqueous placement of reactive waste rock in an existing taconite mine pit. This alternative would evaluate placement of reactive waste rock in an aqueous environment that would retard oxidation of sulfide minerals and reduce the degree of associated water quality concerns. This alternative would also reduce the magnitude of long-term treatment of water contacting reactive rock. As part of this option, the use of various sub-aqueous cover

materials to further restrict oxygen transport to the rock will be evaluated. In addition to environmental impacts, the effect of land and mineral ownership of remaining reserves would be addressed, as well as other pertinent issues.

Off-site Waste Rock Disposal – If there is an excess of non-reactive rock, it might be possible to reduce the total amount of land disturbance and create limnological structure by stockpiling in the Northshore pit. An alternative site may not be feasible or achievable in the time frame of the project. This option will be discussed and a preliminary screening analysis may be conducted.

In-pit Tailings Disposal– Sub-aqueous placement of tailings in an existing taconite mine pit. This alternative is being considered to account for uncertainty about the reactivity of the tailings. The use of the existing tailings basin as currently proposed would likely be unsuitable if the waste characterization indicates that tailings are reactive or if the physical characteristics of the tailings are not suitable for dam construction. This alternative would evaluate placement of tailings in an aqueous environment that would retard oxidation of sulfide minerals and reduce the degree of associated water quality concerns. This alternative would also reduce the magnitude of long-term treatment of water contacting reactive tailings. As part of this option, the use of various sub-aqueous cover materials to further restrict oxygen transport to the tailings will be evaluated. The benefits of this alternative would be greatly diminished if waste characterization determines that the tailings are non-reactive. In addition to environmental impacts, the effect of land and mineral ownership of remaining reserves would need to be addressed, as well as other pertinent issues.

Off-site Tailings Basin– Development of a new tailings basin with an impermeable base to prevent water seepage into the surrounding environment. This alternative is being considered to account for uncertainty about the reactivity of the tailings. The use of the existing tailings basin as proposed would likely be unsuitable if the waste characterization indicates that tailings are reactive. This alternative would evaluate potential impacts associated with developing a new tailings basin. The benefits of this alternative would be greatly diminished if waste characterization determines that the tailings are non-reactive.

2.4 TECHNOLOGY ALTERNATIVES

2.4.1 Mining Technologies

The DNR and USACE do not propose to evaluate alternative mining technologies. The proposed project uses a conventional technology that has been used in other mining operations. The deposit is not suitable for underground mining. Other mining technologies applicable to the NorthMet deposit would likely have no significant environmental benefit over the proposed technologies.

2.4.2 Ore Processing

The DNR and USACE do not propose to evaluate alternative hydrometallurgical technologies. The proposed project uses a technology that does not include cyanide leach or other technologies that may have significant environmental effects. Although there are impacts that will need to be

analyzed for the proposed hydrometallurgical process, other processing technologies would likely have no significant environmental benefit over the proposed technology.

2.5 MODIFIED DESIGNS OR LAYOUTS

There are several design components of the project that the DNR and USACE propose to evaluate by generation and consideration of Technical Design Evaluation Reports. The intent of using these reports is to evaluate various project design components. These reports could be used to optimize effectiveness, implementability, and cost of project design.

Project components that are proposed for Technical Design Evaluation Reports are:

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|------------------------------|--|
| Reactive residue facility - | Evaluation will focus on the suitability and benefits of facility design and location within the existing tailings basin, including size and number of cells. |
| Tailings basin geotechnical- | Evaluation will focus on stability, suitability, and benefits of various tailings dam designs. Alternatives will include upstream dam construction, downstream dam construction, suitability of flotation tailings for dam construction, and location of dams. The evaluation should also consider the mass and source of material needed for dam construction for various dam construction scenarios. |
| Wastewater treatment- | Evaluation will focus on different wastewater treatment technologies for the mine site and ore processing facility. Although specific alternatives for wastewater treatment have not been identified at this time, the wastewater treatment analysis will be used to develop types of treatment technologies that would be suitable given the wastewater characteristics that require treatment. |
| Air emission control- | Evaluation will focus on how available technology for control of emissions would impact other media (i.e. wastewater, solid waste generation, etc.). |
| Wetland mitigation- | Evaluation will focus various options to mitigate for wetland impacts. Potential options include wetland banks, off-site creation of wetlands, off-site protection of wetlands, off-site enhancement of wetlands, out-of-kind mitigation, and on-site mitigation as part of mineland reclamation. |
| Reactive waste segregation- | Evaluation will focus on feasibility and benefits of segregating reactive waste into degrees of reactivity and |

using different stockpiles or designs to manage the waste depending on the degree of reactivity of the waste.

Tailings basin modification- Evaluation will focus on strategies to minimize seepage from the tailings basin.

The evaluation criteria for these reports would include effectiveness, implementability, and cost. The results of the reports will be summarized in the EIS. The ultimate design of project components would be determined by the permitting process.

2.5.1 Mine Pit

The DNR and USACE do propose to evaluate a modified design or layout for the mine.

Mine Pit Backfill – This alternative would evaluate the benefits and feasibility of placing waste rock into the mine pit. This could occur by sequencing of mining to allow placement of waste rock into a previously mined portion of the pit.

2.5.2 Waste Rock Stockpiles

The EIS will address alternative designs and layouts for waste rock stockpiles.

Chemical Modification of Reactive Waste Rock Stockpiles – This alternative will evaluate geochemical modification by incorporation of material into reactive waste rock stockpiles to reduce reactivity or treat reactive water within the stockpile.

2.5.3 Ore Transportation from Mine to Processing Plant

The DNR and USACE do not propose to evaluate alternative designs and layouts for ore transportation from the mine to the processing plant. The proposed project includes using existing railroads with construction of a railroad spur at the mine site and approximately one mile of new railroad to connect the railroad that serves the mine site to the railroad that serves the ore processing plant. Alternative designs and layouts would not likely provide significant environmental benefit over the proposed project.

2.5.4 Ore Processing Plant

The DNR and USACE do not propose to evaluate alternative designs and layouts for the ore processing plant. Alternative designs and layouts would not likely provide significant environmental benefit over the proposed project that makes use of an existing processing plant that would be refurbished and modified.

2.5.5 Wastewater

The EIS will consider the suitability and benefits of alternative designs and layouts for wastewater treatment. In addition to the Technical Design Evaluation Report described in section

2.5, there are several options for management of wastewater that need to be considered. Results from the waste characterization and wastewater treatability studies will be needed to determine the suitability of these alternatives. The following options have been identified:

- Pretreatment of mine site reactive runoff and discharge to Publicly Owned Treatment Works (POTW). The cities of Babbitt and Hoyt Lakes each have a POTW that could be considered.
- Pretreatment of tailings basin process water and discharge to the City of Hoyt Lakes POTW.
- Use of mine site reactive runoff as make-up water for processing plant with single wastewater treatment at the Processing Plant. This option could also include pretreatment and discharge to a POTW.

2.6 SCALE OR MAGNITUDE ALTERNATIVES

The DNR and USACE do not propose to evaluate alternative scale or magnitude of the project. The location and orientation of the NorthMet deposit combined with the infrastructure requirements to mine and process the ore are such that alternative scale/magnitude would likely not have significant environmental benefits compared to the proposed project.

2.7 INCORPORATION OF MITIGATION MEASURES IDENTIFIED THROUGH PUBLIC COMMENTS

The EIS will consider all mitigation measures suggested through public comment. Those mitigation measures that were identified but not carried forward for analysis will be discussed briefly as well as the reasons for their elimination.

3.0 EIS ISSUES

Issues have been identified and described in the Scoping EAW and are categorized below by significance and amount of additional analysis required in the EIS. Mitigation measures that could reasonably be applied to eliminate or minimize adverse environmental effects will be identified in the EIS.

3.1 *Topic has been adequately analyzed in the Scoping EAW. Topic is not relevant or so minor that it will not be addressed in the EIS. The Scoping EAW will be appended to the EIS for reference; the relevant EAW number is provided in parents () after each topic.*

Land Use (Item 9)

Water-related land use management district (Item 14)

Water surface Use (Item 15)

Geologic Hazards and Soil Conditions (Item 19a)

Traffic (Item 21)

Vehicle Related Air Emissions (Item 22)

Visibility (Item 26)

3.2 *Significant impacts are not expected but information beyond that in the Scoping EAW will be included in the EIS.*

3.2.1 Cover Types (Item 10)

The EIS will discuss potential impacts from changes in cover types as a function of time both during and after operation.

3.2.2 Fish and Wildlife Resources (Item 11a)

The EIS will discuss potential impacts to fish and wildlife habitats. This discussion will make use of existing studies that are appropriate for identification of the potential impact. Examples of studies that may be used include The Copper-Nickel Study Plots and previous work in the area completed by ENSR. The EIS will also discuss potential mitigation for impacts to fish and wildlife habitat.

3.2.3 Threatened and Endangered Species (Item 11b)

The EIS will evaluate potential impacts threatened and endangered species. Existing information will be evaluated and additional information collected if necessary to support state and federal regulatory requirements for threatened and endangered species. Potential mitigation strategies and alternatives will be evaluated to prevent and minimize any identified impacts.

3.2.4 Erosion and Sedimentation (Item 16)

If tailings from Cell 2W are needed for dam construction, information on the details of excavation activities, erosion prevention, and reclamation will be developed during EIS preparation.

3.2.5 Air Emissions (Item 23)

The EIS will include descriptions of air emissions sources, potential control technologies and any impacts to Class I and Class II areas.

A BACT analysis will be completed for PM₁₀ and sulfuric acid mist. MACT analysis will be required for some sources after case by case determinations have been made.

The EIS will verify that this AERA truly represents worst case. This verification will include the following analysis:

Conduct source-specific air dispersion modeling of those units that could influence the final risk estimates, specifically focusing on the risk drivers from the AERA (crusher/grinding operations and Hydromet plant; nickel and nickel compounds, hydrogen chloride, NO₂, manganese) and/or conduct a quantitative sensitivity analysis of the critical sources using the new design parameters (location, height, exit velocity, emission database) to determine if the overall risks calculated in this AERA are still conservative estimates.

The EIS will also contain a Class I and Class II increment analysis for air emissions from the project.

3.2.6 Odor and Noise (Item 24)

The EIS will include additional information on potential sources and verify PolyMet simulations and assumptions that were included in the EAW. Operational and structural mitigation to prevent potential impacts will also be discussed.

3.2.7 Archeology (Item 25)

The EIS will verify the location of Knot Camp to avoid disturbance. The historical significance of the Cliff's Erie plant site will be evaluated and mitigation proposed if warranted. The EIS will also provide additional information on areas of "unknown" potential for containing archeological resources. Any resources identified will be discussed and mitigation to prevent impacts will be proposed.

3.2.8 Compatibility with plans and land use regulations (Item 27)

The EIS will evaluate mineland reclamation strategies to develop those designs that are most compatible with surrounding land uses and local community goals.

3.2.9 Infrastructure (Item 28)

The EIS will include an evaluation of wastewater treatment alternatives that propose to use existing Hoyt Lakes or Babbitt POTWs. If any of these alternatives are deemed suitable for further evaluation, the EIS will include details about existing plant capacity and discuss options for increasing capacity and meeting pretreatment and NPDES permit conditions.

The EIS will also include additional detail on the electrical line and substation associated with the mine site. Potential impacts will be identified as well as mitigation of alternatives to prevent or minimize impacts.

3.2.10 Other – Asbestiform Fibers (Item 30)

Additional testing for asbestiform fibers is proposed to occur as part of the Pilot Plant Processing study, and the results of these tests will be included in the EIS. If the results of these tests are consistent with current understanding of the NorthMet deposit, no additional analysis or mitigation will be developed. Existing information about the cleavage fragments crystals related to risk of mesothelioma will be reviewed and summarized in the EIS.

3.3 *Potentially significant impacts may result; information beyond what was in the EAW will be included in the EIS.*

3.3.1 Physical Impacts on Water Resources (Item 12)

Avoidance, minimization and mitigation of the 1,257 acres of potential wetland impacts will be evaluated as part of the EIS. Indirect impacts to wetland function on ecological diversity from changes in hydrology and water chemistry will also be evaluated. The EIS will also discuss the suitability and feasibility of various wetland mitigation strategies. Additional detailed wetland delineations will be included for the first five years of proposed mining activity.

The EIS will include a watershed assessment of the upper Partridge River due to net hydrologic effects of Polymet's proposal. This watershed assessment will evaluate the changes in watershed discharge due to land surface changes (loss of wetlands, vegetation, and mine pit construction), as well as the direct hydrologic changes from mine pit dewatering and other mine site discharges. The response to Question 13 describes a hydrogeologic study that will be used to quantify the mine site discharges. A Level 1 Rosgen geomorphic survey will be conducted for the Partridge River, down to Colby Lake to identify any potentially geomorphological sensitive stream reaches. If the watershed assessment combined with the Level 1 Rosgen geomorphic survey indicates a potential for fluvial geomorphic impacts resulting from Polymet's proposal, there will be additional evaluation of the impact. If this additional evaluation determines that the changes in magnitude, timing, duration or rate of stream flow will cause significant adverse impacts, additional mitigation and monitoring will be developed.

3.3.2 Water Appropriations (Item 13)

Mine Site - The amount of water that must be discharged to dewater the mine pit is a significant issue that will be included in the EIS. In order to better estimate this amount of water the following information will be included in the EIS.

- Design and effectiveness of diking and trenching to prevent surface run-off into the pit.
- Estimates of direct precipitation into the mine pit
- Results of unconsolidated sediment hydrology study
- Results of phase I and phase II hydrogeology study of the NorthMet Deposit including potential water to enter the pit from the Virginia Formation.
- Development of a water balance model to estimate the quantity of water entering the pit from various sources with consideration of seasonal changes and pit size.

This information will be used to help design water treatment facilities and estimate changes in Partridge River streamflow as part of the watershed assessment described in response to Question 12. Hydrologic modeling will also be done to estimate the quantity and timing of outflow from the pit and runoff from stockpiles after mining. This information will be necessary to determine potential water treatment needs for reclamation. Because this water is likely to have come into contact with exposed ore or could be saline, it could be reactive and need appropriate treatment. The amount of water potentially needing treatment will be an important consideration in the EIS.

Processing Plant and Tailings Basin – The EIS will use the results of the pilot plant process and existing information on the LTV tailings basin to develop a water balance model for the processing plant and tailings basin. The EIS will provide additional information on water quantity from the processing plant and tailings basin, including the redesigned seepage collection system. The following information will be used in the water balance model:

- Water generated from the flotation tailings and from the hydrometallurgical processing
- Water collected at the base of the existing tailings basin

- Makeup water needed for the processing plant

Similar to the mine site this information will be used to discuss water quantity effects as well as to develop a better understanding of water treatment needs. Additional information will be presented on the proposed appropriation from Colby Lake.

3.3.3 Surface Water Runoff (Item 17)

The EIS will include surface water quantity and quality impacts as well as alternatives and mitigation to prevent or minimize impacts. Additional detail will be developed for surface water runoff systems that handle non-contact and non-reactive runoff as well as the quality and quantity of this water. Characterization of non-reactive runoff will also be estimated to ensure the suitability of treating this runoff source as non-contact runoff.

The EIS will include information on the quality and quantity of existing water bodies and any potential for changes to these parameters from all aspects of the mining project. Estimation of hydrologic and chemical balances in the Mine Site during normal operations and after closure and the potential effect of discharges on receiving water biota will need to be evaluated in the EIS (the hydrologic and chemical balances for the Tailings Basin and reactive runoff from reactive waste rock stockpiles are addressed in the Response to Question 18).

As part of the EIS, conservative estimates for the flow will be used to insure that any environmental impacts are minimized. (For example, the lowest reasonable estimate of 7Q10 will be used to insure that in stream water quality standards are met.)

3.3.3 Wastewater (Item 18)

Estimates of the quantity and quality of industrial wastewater generation from the mine site, processing plant and tailings basin will be included in the EIS. Predictions will be made as a function of time, during both the operating life of the project and after operations cease.

The following studies and information will be developed as part of the EIS to better understand potential wastewater impacts, and methods of prevention and mitigation as appropriate.

Mine Site

- Waste characterization study results
- Pilot Plant Process Testing
- Phase I and II Hydrogeological Evaluation
- Hydrogeological Investigation of Unconsolidated Surficial Deposits
- Effectiveness of mine site water management systems (including lining and capping systems for reactive waste rock stockpiles)
- Existing water quality data from other sources such as AMAX test shaft, Copper-Nickel Study, and other mining operations.
- Models to predict water quality
- Treatability studies for reactive runoff

- Conceptual treatment design and tests capacity of design to meet expected water quality goals. Synthetic laboratory water, which has the expected chemical composition of seep and pond water, will be created for the test or water from existing stockpiles of Duluth Complex may be used.
- A variety of treatment options will be evaluated. This may include both active and low maintenance treatment.

Mine site open pit

- Composition of the pit walls as a function of time
- Surface area of pit walls
- Models to predict water quality under various closure scenarios

Plant-Tailings Basin

- Tailings Basin/Plant Water and Water Quality Management Approach, including effectiveness of the tailings basin seepage collection system.
- Existing water quality data from tailings basin seepage
- Water quality impacts from emergency basin seepage and material discharged to the basin.
- Processing Plant and Tailings Basin Water Balance and Chemical Budget
 - Chemical budget, modeling of the Tailings Basin seep and pond chemistry requires the following inputs:
 - Model(s) will be run in conjunction with water balance and projected pond water chemistry.
 - Tailings characterization. From ongoing waste characterization studies for new Process Plant tailings.
 - Modeling and tailing leaching kinetics results delivered as part of the NPDES and permit to mine applications
 - Prediction of water quality in cells designed for hydrometallurgical residue
 - Interaction of water from Polymet operation with underlying taconite tailings
- Treatability Study for Seep Water and Water from the Ponds
 - Conceptual treatment design and tests capacity of design to meet expected water quality goals. Synthetic laboratory water, which has the expected chemical composition of seep and pond water, will be created for the test or water from existing stockpiles of Duluth Complex may be used.
 - A variety of treatment options will be evaluated. This may include both active and low maintenance treatment.

Other Issues

- Existing Environment of receiving waters
 - Biological monitoring (fish, mussels, and invertebrates)
 - Existing water quality parameters that do not meet standards
- Mercury

- Ability to meet 1.3 ng/L water quality standard for discharge
- Methylation of mercury due to increased sulfate concentrations

Sanitary wastewater treatment, which will be needed at the Plant and Mine Site, is a conventional technology and will not require significant study for the EIS

3.3.4 Solid Waste (Item 20)

The characterization, handling, and facility design of waste materials will be a significant issue addressed in the EIS. The three components of the project that will be the major focus of this discussion will be waste rock from the mine site, tailings from ore beneficiation process, and reactive residue from the hydrometallurgical processes. Below is a brief description of materials and issues that will be included in the EIS on each of these components:

Mine site waste rock:

- Amounts and composition of non-reactive waste rock, reactive waste rock, and lean ore as determined by the block model
- What chemical composition of waste rock will be the cutoff between non-reactive and reactive waste rock
- What sulfide levels will create acid mine drainage
- Are there other constituents of concern in this material
- Details and effectiveness of the Grade Control Program including details on blast hole sampling for waste rock management
- Details and alternatives for reactive waste rock stockpile design and siting
- Development of a mine waste management plan
- Determine the quantity and quality of drainage to be generated over time

Ore beneficiation process tailings:

- Characterization of tailings
- Suitability of disposal on existing unlined tailings basin
- Evaluation of alternatives for design, construction and siting
- Physical and chemical suitability of existing and new tailings for construction of tailings basin
- Determine the quantity and quality of drainage to be generated over time

Hydrometallurgical processes reactive residue:

- Characterization and quantities of residue
- Design of reactive residue facility
- Suitability of reactive residue facility on existing tailings basin Cell 2W
- Evaluation of alternatives for design, construction and siting
- Determine the quantity and quality of drainage to be generated over time.

Results from the Pilot Plant Processing study and the Waste Characterization Study will be used in conjunction with existing data to generate and characterize the above-described material. The Pilot Plant Processing study will generate tailings and reactive residue from a sample of the NorthMet Deposit of the proposed ore beneficiation and hydrometallurgical processes. The Waste Characterization study is a long term study that would continue after the completion of the EIS. This study makes use humidity cell test of the NorthMet Deposit and Tailings to determine the reactive or non-reactive nature of the materials. Initial data will be available for inclusion in the EIS. As part of the characterization study, PolyMet will conduct a complete chemical and mineralogical study of its waste. This information will be used to compare the predicted behavior of the Polymet material with other samples of Duluth Complex material for which long term data exists. Various methods to speed up potential reactions and comparisons with existing data may be used to determine the applicability of the initial results.

Identification, handling and facility design of other wastes will be included in the EIS.

3.3.5 Cumulative Effects (Item 29)

The EIS will evaluate cumulative effects using guidance from the Council on Environmental Quality handbook for considering cumulative effects under the National Environmental Policy Act (CEQ, 1997). The affected resources that are related to the cumulative effect issues will be used to determine the appropriate geographic and temporal scope to the analysis. The geographic and temporal scope will in turn be used to identify the specific past, present, and reasonably foreseeable future actions to be considered. The following list of cumulative effect issues are proposed for evaluation in the EIS:

- Hoyt Lakes Area Projects and Air Concentrations in Class II Areas
- Class I Areas PM10 Increment
- Ecosystem Acidification Resulting From Deposition of Air Pollutants
- Mercury Deposition and Bioaccumulation in Fish
- Visibility Impairment
- Loss Of Threatened And Endangered Plant Species
- Loss of Wetlands
- Loss or Fragmentation of Wildlife Habitat
- Streamflow and Lake Level Changes
- Water Quality Changes
- Economic Impacts
- Social Impacts

Additional detail about specific analysis of each of these issues is included in response to the Scoping EAW Question 29.

3.3.6 Other – Reclamation (Item 30)

The EIS will evaluate the proposal with consideration for compliance with DNR rules for mineland reclamation. Minnesota Rules for nonferrous metallic metal mining (Chapter 6132) describe the DNR's

policy for nonferrous mines, "...that mining be conducted in a manner that will reduce impacts to the extent practicable, mitigate unavoidable impacts, and ensure that the mining area is left in a condition that protects natural resources and minimizes to the extent practicable the need for maintenance." Alternative designs, layouts, and siting will also be evaluated to determine the most feasible reclamation strategy. The three criteria that will be used in this evaluation will be protection of natural resources, minimization of long-term maintenance, and eventual land use objectives.

As part of the permit to mine, a detailed financial assurance analysis will be conducted. This will include final closure and will also address premature shut down. An evaluation of reclamation costs and its effect on facility design, construction and closure will be discussed in the EIS.

4.0 IDENTIFICATION OF PHASED OR CONNECTED ACTIONS

There are no phased or connected actions associated with this project.

5.0 EIS SCHEDULE (TENTATIVE)

June 2005	Scoping EAW comment period (includes public meeting)
July 2005	Final Scoping Decision Document
December 2005	EIS Preparation Notice Published
June 2006	Draft EIS issued for public review (includes public meeting)
December 2006	Final EIS Issued
March 2007	EIS Adequacy Determined

6.0 SPECIAL STUDIES OR RESEARCH

6.1 Waste Characterization Study

Waste Characterization will be conducted on samples of waste rock material from the NorthMet Deposit and from sample tailings that will be generated from pilot plant testing of the NorthMet Deposit. Waste characterization is a long-term study that would continue after environmental review is complete and even into mining operation. Because the study is an ongoing process decisions need to be made as when information can be used to inform environmental review and permitting activities. The NorthMet Waste Characterization is proposed to generate initial information for use in the draft EIS.

Waste characterization has several components that are described generally below:

- Characterization of mass (amount of waste)
- Physical Characterization (particle size distribution)
- Bulk chemical characterization
- Characterization of mineralogy/petrology (composition)
- Dissolution testing (Humidity Cell Testing)

The results of this study are proposed to provide information about the reactive or non-reactive nature of waste rock and tailings [and degree of reactivity of reactive rock] that would be generated from NorthMet Mining Operations. This information can be used to develop plans and design systems that prevent impacts to natural resources.

6.2 Wastewater Treatability Studies

Results from the pilot plant testing and the waste characterization study will provide information on the quality of water that the mine and process will likely generate. Water balances will be used to estimate the quantity of water requiring treatment. With this information samples of water will be generated that simulate the wastewater that will require treatment. These samples will be subject to various wastewater treatment technologies. The water will be tested again to determine if the treatment technology was successful in generating water that can meet water quality standards. This information will be used to plan and design for wastewater treatment technologies or alternatives to prevent impacts to natural resources.

6.3 East Range Multi-Jurisdictional Community Readiness Assessment: Employment, Economic and Social Impacts

A quantitative assessment of cumulative employment and economic effects will be performed. Background information on employment and the economy of St. Louis County and the East Range will be summarized:

- Historical population trends by county and major population centers since 1970*
- Historical employment trends by county since 1970*
- Historical tax revenue trends by county since 1970*
- Summary of historical economic activity (major industries, major sources of employment) by county since 1970*
- Summary of population, employment, tax revenue and economic activity in 2002 (the baseline year)

** Approximate date. Actual historical data will be collected based on availability of primary sources and the economic/fiscal impact model used for the assessment.*

Impact analyses will be completed through input-output mathematical modeling to estimate employment impact, output impact and value added measures in terms of total (direct, indirect and induced) impacts for the construction period, operations period and closure period. Analyses will also assess impacts to State, Local and Federal taxes and royalties.