Appendix A

Thematic Responses to DEIS Comments

NorthMet EIS – DEIS Comment Thematic Responses

Acronyms Used

AERA – Air Emissions Risk Analysis
ARD – Acid Rock Drainage
AMD – Acid Mine Drainage
BA – Biological Assessment
BACT – Best Available Control Technology
BWCAW – Boundary Waters Canoe Area Wilderness
CAA – Clean Air Act
CEQ – Council on Environmental Quality
CWA – Clean Water Act
DEIS – Draft Environmental Impact Statement
EIS – Environmental Impact Statement
GLI – Great Lakes Initiative
GHG – Greenhouse Gases
HMMP – Hazardous Materials Management Plan
IAP – Impact Assessment Planning
LTVSMC – LTV Steel Mining Company
MAAQS – Minnesota Ambient Air Quality Standards
MDH – Minnesota Department of Health
MDNR – Minnesota Department of Natural Resources
MFRC – Minnesota Forest Resources Council
MPCA – Minnesota Pollution Control Agency
NAAQS – National Ambient Air Quality Standards
NEPA – National Environmental Policy Act
NHPA – National Historic Preservation Act
NO_2 – Nitrogen dioxide
NPDES – National Pollutant Discharge Elimination System
NSR – New Source Review
PDEIS – Preliminary Draft Environmental Impact Statement
$PM_{2.5}$ – Particulate matter up to 2.5 micrometers in diameter
RFSS – Regional Forester Sensitive Species
SDEIS – Supplemental Draft Environmental Impact Statement
SNF – Superior National Forest
SO_2 – Sulfur dioxide
TMDL – Total Maximum Daily Load
tpy – Ton(s) per year

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Acronyms Used
USACE – U.S. Army Corps of Engineers
USEPA – U.S. Environmental Protection Agency
USFS – U.S. Forest Service
USFWS – U.S. Fish and Wildlife Service
USGS – U.S. Geological Society
WWTF – Wastewater Treatment Facility
WWTP – Wastewater Treatment Plant

Theme Code	Theme Statement	Thematic Response
Section: Comparison of Alternatives (ALT)		
ALT1	The DEIS does not adequately define or study the No-Action Alternative.	The No Action Alternatives for the NorthMet Project Proposed Action and the Land Exchange Proposed Action are defined in Sections 3.2.3 and 3.3.3 of the SDEIS, respectively. The environmental consequences of the NorthMet Project No Action Alternative are addressed in the respective sections of Chapter 5. Comparisons of the NorthMet Project Proposed Action and the alternatives, including the No Action Alternative, are shown in Chapter 7.
ALT2	The DEIS does not adequately evaluate the Mine Site alternative and it fails to look beyond the proposed Mine Site.	The NorthMet Project Proposed Action and the alternatives have changed substantially since preparation of the 2009 DEIS. The "Mine Site Alternative" was incorporated into the Proposed Action and is no longer applicable as an alternative (refer to Section 3.2.3 of the SDEIS for more information). The Mine Site location depends on the presence of the viable NorthMet Deposit. The location of the Mine Site and alternatives are discussed in Section 3.2.3 of the SDEIS.
ALT3	The DEIS does not adequately evaluate the underground mining alternative. This alternative should not be eliminated from consideration on the basis of costs.	The underground mining alternative was revisited and determined not to be a viable alternative; therefore, it remains eliminated from further evaluation. The Co-lead Agencies prepared a position paper on the underground mining alternative; this document is attached as an appendix to the SDEIS. Alternatives considered for the NorthMet Project Proposed Action in the SDEIS are described in Section 3.2.3.
ALT4	The DEIS does not adequately evaluate the tailings basin alternative and fails to consider the reactions between seepage and the existing tailings.	The SDEIS NorthMet Project Proposed Action (including tailings management) and the alternatives have changed substantially since preparation of the 2009 DEIS. There is no longer a tailings basin alternative. Management of tailings as part of the NorthMet Project Proposed Action is addressed in Section 3.2.2 of the SDEIS. Environmental consequences are addressed in Section 5.2.
ALT5	The DEIS should provide additional details regarding mitigation and long-term management of the site, particularly related to water treatment.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS. Mine Site and Plant Site water management are addressed in Section 3.2.2 of the SDEIS. Environmental consequences on water resources are discussed in Section 5.2.2.

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ALT6	The DEIS fails to include quantitative information, such as numbers from key indicators for each resource, in the comparison of alternatives table.	The NorthMet Project Proposed Action and the alternatives have changed substantially since preparation of the 2009 DEIS. The NorthMet Project Proposed Action and alternatives are described in Chapter 3 of the SDEIS; Chapter 7 of the SDEIS provides a comparison of alternatives.
ALT7	The DEIS fails to adequately identify a preferred alternative.	Chapter 7 of the SDEIS provides a comparison of alternatives and discusses the agency position on offering a preferred alternative. Consistent with the CEQ regulations, the federal Co-lead Agencies are required to identify an agency-preferred alternative in a DEIS, if one exists, and in the FEIS unless another law prohibits the expression of such a preference. At this time, the Co-lead agencies have not identified a preferred alternative, and for the USACE, 33 CFR Part 325, Appendix B, supersedes identification of an agency-preferred alternative. No similar requirement to identify a preferred alternative exists for the MDNR under state law.
ALT8	The DEIS fails to consider a full range of alternatives to meet the intent of NEPA.	CEQ requires that a "reasonable range of alternatives" be analyzed. These may include those not carried forward for detailed analysis. The NorthMet Project Proposed Action in the SDEIS represents a project that has incorporated a number of previous alternatives and mitigation measures considered as alternatives at earlier stages of the EIS process. Many other alternatives have been identified but eliminated from detailed analysis because they didn't offer potentially significant environmental benefits, did not meet the project's purpose and need, or were not otherwise reasonable (technically or financially viable) in accordance with CEQ guidance. The NorthMet Project Proposed Action and alternatives are described in Chapter 3 of the SDEIS. Various other alternatives identified but eliminated in the DEIS are discussed in Section 3.2.3.
ALT9	The DEIS must address modifications and mitigation methods with less uncertainty.	The NorthMet Project Proposed Action, alternatives, and mitigation measures have changed substantially since preparation of the 2009 DEIS. Proposed mitigation measures are discussed in the respective parts of Section 5.2 and summarized in Chapter 7 of the SDEIS.

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	Section: Air Quality (AQ)	
AQ1	The DEIS did not adequately address the potential for fugitive emissions from reactive waste rock, rail cars, tailings basin, or road travel. Further data is needed to evaluate the issue.	Based upon the comments provided on the DEIS, the analyses in Section 5.2.7 of the SDEIS were developed in the Co-lead Air IAP Workgroup. These include revised air emissions protocols for Class I, Class II, mercury deposition, AERA, and GHG assessments. Waste rock acidification was previously addressed and was updated as part of the SDEIS refinements. Based upon the Co-lead Air IAP workgroup, it was determined that any effects on air quality from fugitive dust from rail transport would be minimal due to the coarse nature of the oar. The potential for acidification effects associated with deposition of fugitive dust from rail car hauling was addressed under Water Resources. Surface Water IAP workgroup evaluated this issue and recommended that surface water quality data be collected to address this issue. Emissions from other fugitive emissions including mobile sources are also evaluated.
AQ2	The evaluation that the NorthMet Project Proposed Action would be a "new" rather than an "existing" source of air emissions was made incorrectly or needs further analysis.	Due to the 9-year inactivity of taconite-processing equipment currently owned by Cliffs Erie, LLC and backed by USEPA's well-established reactivation policy, the MPCA has made a preliminary determination that those units would need to go through PSD applicability and new permitting if they were to be restarted by PolyMet.
AQ3	The potential for GHG emissions that contribute to climate change was not thoroughly analyzed in the DEIS, including the effects on carbon sequestration resulting from the disturbance of peat and the resulting impact on wildlife.	To address these comments, GHG issues have been assessed in a manner consistent with USEPA and MPCA guidance, and the CEQ's *Draft NEPA Guidance on Climate Change and Greenhouse Gas Emissions* (February 18, 2010). This assessment is addressed in Section 5.2.7 and 5.3.7 of the SDEIS.
AQ4	Air quality modeling and analysis was not complete, lacks accurate data, did not consider all comments, or needs further explanation.	The procedures for inclusion of sources were described in the DEIS. Sources have been evaluated for inclusion based upon their potential to contribute to a significant effect. The proposed facility has not been determined to be a major source under the CAA for any of the criteria pollutants. Therefore, the analysis is consistent with MPCA requirements for permitting. Since the DEIS, the USEPA and federal courts have recently modified major source determination to include GHG emissions. The SDEIS revaluated the major source status for the NorthMet Project Proposed Action and has shown that the proposed facility would not be determined a major source for GHG, or any other regulated pollutant, and thus, no formal major NSR is required, including federal-mandated modeling and BACT requirements. This assessment is addressed in

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		Section 5.2.7 of the SDEIS. The Class I, Class II, AERA, mercury deposition, and cumulative modeling analyses protocols for the SDEIS were updated to include the latest air quality regulations, including 1-hour NO_2 and SO_2 analyses, $PM_{2.5}$ requirements, and GHG evaluations. The modeling protocols were revised in collaboration with the Co-lead Air IAP Workgroup and are incorporated as part of the SDEIS.
AQ4A	Further modeling or studies, including a BACT analysis, should be completed.	There are no current requirements for federal BACT analysis for minor sources (see Theme AQ4). However, PolyMet conducted the equivalent of a major source BACT evaluations for $PM_{2.5}$ (a minor source) and mercury. These evaluations contributed to the SDEIS analysis of the AERA, mercury bioaccumulation, $PM_{2.5}$, and asbestos-like fibers. The analyses are summarized in Section 5.2.7 of the SDEIS.
AQ4B	The cumulative impacts analysis for air quality lacked complete analysis. Specific contributing projects should be included.	The procedures for inclusion of sources were described in the DEIS. Sources are evaluated for inclusion based upon their potential to contribute to a significant effect. Specific contributing projects are identified in Chapter 6 of the SDEIS.
AQ4C	Evaluation of the potential for asbestiform fibers and amphibole fibers must be completed for the assessment of impacts to be considered complete.	Based upon the revised project, a qualitative evaluation of the effects from asbestiform fibers is included in Section 5.2.7 of the SDEIS.
AQ4D	The potential for acid rain and the resulting impacts should be addressed and analyzed.	The potential for acid rain is evaluated in the Class I regions nearby the NorthMet Project area. Effects of acidification were addressed in the DEIS. An expanded discussion of these effects, including additional lake communities, is included in Section 5.2.7 of the SDEIS.
AQ4E	The geographical scope of the DEIS is not sufficient to capture potential impacts.	Air quality effects are addressed based upon statewide established criteria for significant effects. Additional analyses were conducted for all representative Class I regions, including visibility and mercury deposition. Expanded acidification assessment for additional lake communities surrounding the NorthMet Project area is assessed in Section 5.2.7 of the SDEIS.
AQ5	Air quality monitoring plans and mitigation measures are insufficient or should be more thoroughly explained in the EIS document. Further mitigation measures should be pursued.	As discussed in the SDEIS, air emissions from the NorthMet Project Proposed Action would be less than PSD major source thresholds for all criteria pollutants. The MPCA is responsible for ensuring that the NorthMet Project Proposed Action would not exceed applicable standards during the permitting process. Permit requirements

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		needed to ensure compliance with standards will be included in any future permits. There will be an opportunity for public participation in the permitting process, as well.
AQ6	The NorthMet Project Proposed Action's potential to exceed standards for air quality or endanger the health of humans and wildlife should be more thoroughly addressed. More risk assessment for human health impacts should be completed.	Air quality impact analyses in the DEIS follow State of Minnesota and federal guidelines, and effects were addressed in the DEIS. Based upon comments received on the DEIS and the availability of more recent information, additional analyses were conducted for the Class I, Class II, MAAQS, and NAAQS. In addition, updated AERA and mercury assessments were conducted to address risk assessment of human health effects. The updated analyses are addressed in Section 5.2.7 of the SDEIS.
AQ6A	The potential for mercury emissions to exceed standards or endanger the health of humans and wildlife was not adequately addressed.	PolyMet has revised the Mercury Deposition Analysis in collaboration with the Co-lead Air IAP Workgroup to include an expanded area up to 10 km from the facility, and includes potential sources up to 25 km from the facility. This expanded analysis incorporates several new lake regions, including Sabin Lake, Wynne Lake, Heikkila Lake, Colby Lake, and Whitewater Lake. Results of this analysis are discussed in Section 5.2.7 of the SDEIS.
AQ7	Permitting questions regarding emission thresholds and permitting criteria should be addressed.	As discussed in the SDEIS, air emissions from the NorthMet Project Proposed Action would be less than PSD major source thresholds for all criteria pollutants. The MPCA is responsible for ensuring that the NorthMet Project Proposed Action would not exceed applicable standards during the permitting process. Permit requirements needed to ensure compliance with standards will be included in any future permits. There will be an opportunity for public participation in the permitting process, as well.
AQ8	Issues regarding Class II classifications were inadequately addressed.	The analysis in the DEIS was based upon the most current available data and guidance. The SDEIS updates the existing analysis with the most current information and reflects the most recent review of potential mitigation measures (See Theme AQ4).
AQ9	Issues regarding Class I classifications were inadequately addressed.	Please see response to Theme AQ8.
Section: Compatibility with Plans and Land Use (CPLU)		
CPLU1	The NorthMet Project Proposed Action is inconsistent with biodiversity and habitat policies, such as those in the MFRC Landscape Plan.	Although an informative plan, per NEPA, the MFRC Landscape Plan is not part of the legal framework to which the SDEIS must conform. The Land Use Sections of SDEIS Chapters 4, 5, and 6 address the NorthMet Project Proposed Action's performance with respect to the land use aspects of the legal framework.

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CPLU2	The NorthMet Project Proposed Action is inconsistent with water quality, recreation, and cultural resources policies, such as those in the St. Louis River Management Plan.	Conformance with water quality, recreation, and cultural resources policies is addressed in the Water Resources, Socioeconomics, Land Use, Recreation/Visual, and Cultural Resources sections of SDEIS Chapters 5 and 6.
CPLU3	The NorthMet Project's compatibility with the Superior National Forest's Forest Plan should be specifically considered.	The Land Use sections of SDEIS Chapters 4, 5, and 6 evaluate compatibility with the Superior National Forest Plan.
CPLU4	The Land Exchange Proposed Action with USFS should be concluded and evaluated before the EIS is completed.	The Land Exchange Proposed Action is fully evaluated as part of the SDEIS. See Chapter 5.3 of the SDEIS.
Section: Cultural Resources (CR)		
CR1	The DEIS does not adequately address impacts to and mitigation measures for cultural resources, including those that relate to 1854 Treaty rights and tribal resource gathering.	The federal Co-lead Agencies are actively consulting with the federally recognized bands that have expressed an interest in consulting for the NorthMet Project Proposed Action to identify and address these and other related concerns. Consideration of effects on cultural resources or culturally significant natural resource that do not qualify for the NHPA addressed in SDEIS Chapters 4, 5, and 6.
CR2	Section 106 consultation is needed prior to the completion of the EIS to address the presence of cultural sites and use of resources by tribal members.	The federal Co-lead Agencies have actively consulted with the three federally recognized Bands that have expressed an interest in consulting for the NorthMet Project Proposed Action, including interviews with Band members. Effects to cultural resources and culturally significant natural resources are addressed in the Cultural Resources section of SDEIS Chapters 4, 5, and 6.
CR3	The 1854 Treaty Ceded Territory should be considered a traditional cultural property and the NorthMet Project Proposed Action's area of potential effect should be expanded to include 1854 Treaty Ceded Territory.	At the time the 2009 DEIS was prepared, the Co-lead Agencies had not yet formally determined the area of potential effect determination. The Cultural Resources section of SDEIS Chapters 4 and 5 address the Co-lead Agencies' determination of the NorthMet Project Proposed Action's area of potential effect, as well as the Co-lead Agencies' consideration of the 1854 Ceded Territory as a traditional cultural property.
CR4	The EIS should discuss the federal government's trust responsibility as part of the 1854 Treaty and address potential impacts and proposed mitigation/compensation for loss of access to	The Cultural Resources section of SDEIS Chapters 4 and 5 addresses the federal Co-lead Agencies' federal tribal trust responsibilities as part of the 1854 Treaty. These sections, along with relevant sections of Chapter 6, also address effects on, and any proposed mitigation for effects on cultural resources and culturally significant natural

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	resources.	resources that do not qualify for listing on the NRHP.
CR5	The EIS should further evaluate and /or remove reference and use of the draft work known as, "The Protocol to Assess Expanded Cumulative Impacts to Native Americans."	This document has been reviewed and protocol discussed. The SDEIS complies with CEQ guidance for the cumulative effects analysis.
Section: Fish and Macroinvertebrates (FM) (DEIS Section Title)—Section Now Titled "Aquatic Species"		
FM1	The DEIS does not adequately analyze the impacts from the Mine Site operation on fish and macroinvertebrate species. Particular concerns include seepage of mercury and other constituents, alteration of flow conditions, water quality exceedances, and bioaccumulation.	Effects on aquatic resources, such as fish and macroinvertebrate species, as a result of mercury seepage and potentially harmful constituents, alteration of flow, and bioaccumulation are discussed in detail in Sections 5.2.6 and 5.3.6 of the SDEIS.
FM2	The DEIS does not provide sufficient baseline characterizations, including sampling and modeling, to effectively describe populations and potential effects on fish and macroinvertebrates.	Existing conditions, including baseline characterizations and any additional threatened or endangered species listed after the DEIS was released, are discussed in detail in Sections 4.2.6 and 4.3.6 of the SDEIS. Potential effects on these species are detailed in Sections 5.2.6 and 5.3.6 of the SDEIS.
FM3	The cumulative effects analysis needs to be expanded to include the effects of sulfate and mercury, bioaccumulation, climate change, and habitat degradation on the fisheries and macroinvertebrates of the region.	Cumulative effects on aquatic species and the metrics used for analysis of potential effects are included in Chapter 6 of the SDEIS.
FM4	The DEIS lacks sufficient monitoring, adaptive management, and mitigation measures for aquatic species.	Monitoring plans and potential mitigation measures for the NorthMet Project Proposed Action are discussed in Sections 5.2.6 and 5.3.6, and Chapter 7 of the SDEIS.
FM5	The DEIS does not provide sufficient information to demonstrate compliance with federal and state permitting and guidance requirements including the CWA, state water quality standards, TMDL levels, and fish consumption advisories.	Existing aquatic habitat and species are described in Section 4.2.6 and 4.3.6 of the SDEIS. Effects to aquatic resources as a result of the NorthMet Project Proposed Action are described in Sections 5.2.6 and 5.3.6. The evaluation of the NorthMet Project Proposed Action's potential environmental effects against EIS evaluation criteria is included in Sections 5.2.2, 5.2.6, 5.3.3, and 5.3.6 of the SDEIS. The Adaptive Water Management Plan addresses the wastewater treatment systems that would be used to

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		manage water (see Section 3.2.2 of the SDEIS).
Section: Geotechnical Stability (GT)		
GT1	Detailed mitigation, alternatives, stability analysis, and contingency plan information must be included in the EIS, not deferred to permitting.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and design and stability of the geotechnical features are further analyzed and addressed in Sections 3.2.2 and 5.2.14 of the SDEIS.
GT2	Environmental consequences of dam failures must be disclosed in the EIS.	The NorthMet Project Proposed Action, including the design and geotechnical stability of the Tailings Basin and Hydrometallurgical Residue Facility, has changed substantially since preparation of the 2009 DEIS. The design of the Tailings Basin and Hydrometallurgical Residue Facility is discussed in Section 3.2.2 of the SDEIS. The structural integrity of the Tailings Basin and Hydrometallurgical Residue Facility and the proposed maintenance and adaptive management measures of these facilities to maintain that integrity is discussed in Section 5.2.14 and Chapter 7 of the SDEIS. Because the proposed design would meet the minimum factor of safety requirements, the potential for failure of the dams is considered low. Discussion of effects associated with such failure would be speculative and thus outside the scope of the SDEIS.
GT3	The EIS must address disposal of coal ash and other non-taconite tailings materials in the existing LTVSMC Tailings Basin and any implications to Tailings Basin stability.	The NorthMet Project Proposed Action, including the design and geotechnical stability of the Tailings Basin and Hydrometallurgical Residue Facility, has changed substantially since preparation of the 2009 DEIS. The existing conditions at the existing LTVSMC Tailings Basin, and the structural integrity of the proposed Tailings Basin and Hydrometallurgical Residue Facility, are discussed in section 4.2.14 and 5.2.14 of the SDEIS.

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	Section: Hazardous Materials (HM)	
HM1	The DEIS does not adequately address the assessment of operational type chemical waste for recycling.	Section 5.2.13 of the SDEIS addresses the preparation of a Hazardous Materials Management Plan. The Hazardous Materials Management Plan will describe the methods for handling, storage, and disposal. This may also include recycling of materials used or generated during the operations.
HM2	The DEIS does not properly characterize ore and waste rock piles from the mining process as hazardous materials and hazardous waste in accordance with *Minnesota Rules*, nor does it adequately discuss the cumulative effects of these materials as "hazardous materials".	Based on the *Minnesota Rules*, Chapter 7045.0120, Identification and Listing of Hazardous Waste-Exemptions and Special Requirements, this waste is exempted. Also see Chapter 7045.0214: Evaluation of Wastes, Subpart I, "Any waste evaluated and exempted under part 7045.0075 or 7045.0120 does not need to be re-evaluated under this part." Other waste in question will be properly evaluated and managed per the Hazardous Materials Management Plan for the facility. These issues are described in Section 5.2.13 of the SDEIS.
HM3	The DEIS does not adequately analyze and address the risk associated with the transportation of materials of a hazardous nature.	Transportation of materials of a hazardous nature will be addressed in more detail in the NorthMet Project Proposed Action plan and the Hazardous Materials Management Plan (when developed), and is discussed in Section 5.3.13 the SDEIS.
HM4	The chemical composition, toxicity, use, impact, and mitigation of chemical products discharged in wastewater and in the hydrometallurgical residue must be further addressed in accordance with federal and Minnesota hazardous waste regulations.	As described in Section 5.2.13 of the SDEIS, hazardous materials and potentially hazardous wastes will be characterized, managed, and disposed of or recycled per the Hazardous Materials Management Plan (to be completed), which will follow requirements of *Minnesota Rules*, Chapter 7045: Hazardous Waste.
HM5	The DEIS does not adequately assess the nature and characteristics, including radioactivity, of cobalt.	Hazardous materials are addressed in Section 5.2.13 of the SDEIS. If present, cobalt-60 and other hazardous or potentially hazardous materials or wastes will be characterized and managed per the Hazardous Materials Management Plan (to be completed), which will follow requirements of *Minnesota Rules*, Chapter 7045: Hazardous Waste.
HM6	The DEIS does not adequately consider the cumulative impacts of hazardous materials from other projects, including hazardous materials already in the watershed.	Evaluation of cumulative effects of hazardous materials on the watershed, as well as those from other projects, are addressed in further detail as appropriate in Chapter 6 of the SDEIS.

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Section: Irreversible and Irretrievable Commitment of Resources (IRR)		
IRR1	The DEIS does not adequately characterize the fossil fuels consumed during mine development, operation, and closure.	Irreversible and irretrievable commitments of these resources are discussed in Chapter 7 of the SDEIS.
IRR2	The DEIS does not adequately characterize the loss of natural and cultural resources, such as high-quality forests, wetlands, and traditional cultural activities.	Effects on cultural resources and the relationship between natural resources and cultural resources are discussed in Section 5.2.9 and 5.3.9 of the SDEIS. Irreversible and irretrievable commitments of these resources are discussed in Chapter 7 of the SDEIS.
Section: Noise (N)		
N1	Noise impacts from operation of the NorthMet Project Proposed Action on the surrounding region are not properly modeled or explained in the DEIS.	To address this issue, Section 5.2.8 of the SDEIS includes a visual representation of noise contours to show the extent of noise effects on sensitive receptors within the surrounding region.
N2	The DEIS does not adequately address noise mitigation.	Noise mitigation measures and monitoring plans are addressed in Section 5.2.8 and Chapter 7 of the SDEIS.
N3	The DEIS does not adequately characterize the cumulative effects of noise, including vibration, from the NorthMet Project Proposed Action and other activities.	Further modeling of the potential cumulative noise and vibration effects on the surrounding environment has been conducted since the preparation of the 2009 DEIS. Cumulative noise and vibration effects, and the metrics used for analysis of potential effects, are discussed in Chapter 6 of the SDEIS.
N4	The DEIS does not adequately characterize the effects of NorthMet Project Proposed Action-related noise, including blasting, on wildlife.	NorthMet Project Proposed Action--related noise effects on wildlife, including blasting, are discussed in detail in the Section 5.2.5 of the SDEIS.
N5	The DEIS does not adequately characterize the effects of project-related noise, including blasting, on human health.	NorthMet Project Proposed Action-related noise effects on human health, including blasting, are discussed in detail in the Section 5.2.7 of the SDEIS.

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N6	The DEIS does not adequately characterize the impacts of discontinuous noise, such as blasting, on people who use the NorthMet Project area for recreation, fishing, and hunting.	The effects of discontinuous noise, such as blasting, on people who use the NorthMet Project area for recreation, fishing, and hunting are discussed in detail in Section 5.2.8 of the SDEIS.
Section: Project Description (PD)		
PD1	The DEIS does not adequately explain the Land Exchange Proposed Action, which is a connected action.	The Land Exchange Proposed Action is addressed as part of the NorthMet Project Proposed Action and alternatives throughout the SDEIS.
PD2	The DEIS NorthMet Project Description does not adequately describe the potential for release of contaminants, hazardous wastes, or acid rock drainage from waste rock, the Tailings Basin, or failure of liner systems on surface and groundwater quality standards.	The NorthMet Project Proposed Action, including management of waste rock and tailings, has changed substantially since preparation of the 2009 DEIS. Management of waste rock and tailings is addressed in Section 3.2.2 of the SDEIS. The potential effect of waste rock and tailings on surface and groundwater quality is addressed in Section 5.2.2 of the SDEIS.
PD3	The DEIS does not adequately analyze the scope or effectiveness of closure and reclamation plans.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS. Closure and reclamation of the NorthMet Project area is described in Section 3.2.2 and long term environmental consequences are described in Section 5.2 of the SDEIS.
PD4	The DEIS does not adequately describe financial assurance.	Financial assurance for closure and remediation of the NorthMet Project area is addressed in Section 3.2.2.4 of the SDEIS.
PD5	The DEIS does not adequately describe the WWTF, including the seepage/discharge collection from the Tailings Basin or Hydrometallurgical Residue Facility.	The NorthMet Project Proposed Action, including details of water management at the Tailings Basin has changed substantially since preparation of the 2009 DEIS, and is further addressed in Section 3.2.2 of the SDEIS.
PD6	The DEIS does not fully evaluate geotechnical stability, including a stockpile stability analysis.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS. The existing geotechnical conditions at the NorthMet Project area are discussed in Section 4.2.14. The design and structural integrity of the proposed geotechnical features is addressed in Sections 3.2.2 and 5.2.14 of the SDEIS.

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PD7	The DEIS does not adequately describe the transportation of ore between the Mine Site and Plant Site or the necessary transportation infrastructure.	The transportation of ore between the Mine Site and Plant Site is discussed in Section 3.2.2 of the SDEIS.
PD8	The DEIS contains insufficient baseline data, monitoring measures, mitigation methods, and modeling, and does not include newly identified issues.	Existing environmental conditions including results of baseline modeling are discussed in Chapter 4 of the SDEIS. Management and mitigation measures of the NorthMet Project Proposed Action and alternatives are described in Chapter 3. Environmental consequences are addressed in Chapter 5. A summary and comparison of the mitigation and management measures for the NorthMet Project Proposed Action and alternatives and the environmental consequences is provided in Chapter 7 of the SDEIS.
PD9	The DEIS NorthMet Project Description is not complete, and/or is not consistent with the PDEIS.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS, and the description of the NorthMet Project Proposed Action and alternatives has been updated in the SDEIS.
PD10	The DEIS does not adequately describe the NorthMet Project Proposed Action's relationship to plant and wildlife species, habitat, and high quality forests and wetlands.	The existing environmental conditions and the potential environmental consequences relating to the NorthMet Project Proposed Action are addressed in Chapters 4 and 5 of the SDEIS, respectively.
PD11	The DEIS does not adequately describe the placement of waste rock piles and stockpiles of overburden.	The NorthMet Project Proposed Action, including management of waste rock and overburden, has changed substantially since preparation of the 2009 DEIS. Management of waste rock and overburden is addressed in Section 3.2.2 of the SDEIS.
PD12	The DEIS does not adequately describe Superior National Forest plans and regulations or whether they will be adhered to.	The Land Exchange Proposed Action is described in Section 3.3. The potential effect of the proposed change in land use at the NorthMet Project area and the considerations for existing and surrounding land management are addressed in Sections 5.2.1 and 5.3.1 of the SDEIS.
PD13	The DEIS does not adequately address due diligence on the NorthMet Project Proposed Action.	Due diligence for the NorthMet Project Proposed Action is addressed in Chapter 3 of the SDEIS.
PD14	The DEIS does not adequately describe the moratorium on sulfide mining in Wisconsin.	The moratorium in Wisconsin is outside the scope of the NorthMet Project Proposed Action, and is therefore not discussed in the SDEIS.

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	Section: Process (PRO)	
PRO1	The DEIS does not adequately adhere to the EIS/NEPA process or involve appropriate agencies.	Chapter 1 of the SDEIS provides information about the Cooperating Agencies that were included during the scoping period for the DEIS, as well as other agencies involved in development of the SDEIS. The three Co-Lead Agencies (MDNR, USACE, and USFS) each ensured that federal and state environmental impact processes were followed, and that the process adhered to each agency's internal requirements.
PRO2	The DEIS does not adequately analyze project alternatives, as there is too much uncertainty.	The NorthMet Project Proposed Action and the alternatives have changed substantially since preparation of the 2009 DEIS. Alternatives (including the NorthMet Project No Action Alternative) are described in Chapter 3 of the SDEIS; a comparison of alternatives is provided in Chapter 7.
PRO3	The DEIS contains insufficient data/studies, explanations of methodologies, and proposed mitigation measures.	New data and studies, methodologies, and mitigation measures are discussed in detail in the SDEIS. Individual resource-specific sections incorporate new data or studies and explanations of methodologies in Chapter 4, while mitigation measures are discussed in resource-specific sections of Chapter 5 of the SDEIS.
PRO4	The DEIS does not adequately incorporate all connected actions and other actions into the cumulative effects analysis.	All connected actions, including the Land Exchange Proposed Action, are included in the cumulative effects analysis in Chapter 6 of the SDEIS. Resource-specific effects of the Land Exchange Proposed Action are included in Chapter 6 of the SDEIS.
PRO5	Analysis regarding the Cultural Resources section was not appropriately completed, as Section 106 consultation was incomplete.	The federal Co-lead Agencies are actively consulting with federally recognized Bands that have expressed an interest in consulting for the NorthMet Project Proposed Action. Consultation includes interviews with tribal members. Effects on cultural resources are addressed in the Section 5.2.9 of the SDEIS. The Section 106 evaluation must be complete before the federal agencies can complete their respective RODs.

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PRO6	The DEIS process did not allow adequate public participation, and specifically lacked adequate public comment periods or meetings. All issues of public opposition should be addressed.	The NEPA public participation process for the DEIS is discussed in detail in Section 2.2 of the SDEIS. Two meetings and a 90-day comment period were provided for the DEIS. A separate scoping period for the Land Exchange Proposed Action occurred in the fall of 2010. For the SDEIS, the number of public meetings and length of the comment period will be determined by the Co-lead Agencies. Public comments and positions voiced in the record at both public meetings and through written comments have been considered in the development of the SDEIS.
PRO7	The DEIS does not adequately evaluate potential violations of laws or standards, such as the CAA, CWA, etc.	As described in Section 1.4 of the SDEIS, the NorthMet Project Proposed Action must comply with all applicable laws and standards. Resource-specific laws and regulations are discussed in the corresponding resource sections.
PRO8	The DEIS does not adequately incorporate the Feasibility Study for the Land Exchange Proposed Action.	The Land Exchange Proposed Action is discussed in detail throughout the SDEIS. Individual chapters incorporate information from the USFS Land Exchange Feasibility Study, as well as other sources.
PRO9	The DEIS does not fully include tribal Cooperating Agency comments.	The federal Co-lead Agencies are actively consulting with the three federally recognized bands that have expressed an interest in consulting for the NorthMet Project Proposed Action. Discussion of tribal comments and concerns are a part of this consultation. These comments are addressed in the SDEIS and through ongoing consultation.
PRO10	The DEIS does not adequately describe any financial assurance for the project or implications of an environmental disaster.	Financial assurance for closure and remediation of the NorthMet Project area is addressed in Chapter 3 of the SDEIS. A Co-lead Agency document dated August 23, 2011, describes the mechanism for addressing financial assurance in the SDEIS.
Section: Socioeconomics (SE)		
SE1	The DEIS incorrectly implies that there are no economic benefits from the NorthMet Project No Action Alternative.	The SDEIS more clearly states that there would be no additional economic benefits from mining activity in the NorthMet Project No Action Alternative, but that other economic activity in the region would remain unaffected. Existing non-mining economic activity is described in greater detail in Section 4.2.10 the SDEIS.
SE2	The EIS should include a full EJ evaluation, focused specifically on impacts to local tribes.	The EJ analysis has been expanded, and is presented in Section 5.2.10.2.6 of the SDEIS, based on input from the Socioeconomic IAP Workgroup.
SE3	The DEIS overestimates the NorthMet Project Proposed Action's relatively short-term employment	These issues are addressed in Section 5.2.10 of the SDEIS, based on input from the

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	benefits, and does not adequately address long-term, post-closure costs, or the "boom and bust" cycle associated with extractive industries.	Socioeconomic IAP Workgroup.
SE4	The DEIS does not adequately account for the NorthMet Project Proposed Action's adverse long-term impact on the region's tourism and real estate economies, which are based on high environmental quality (actual and perceived).	Please see response to Theme SE3.
SE5	The EIS should evaluate the long-term community health impacts associated with pollution from the NorthMet Project Proposed Action.	Effects on human health are primarily addressed in Section 5.2.7 and 5.3.7 of the SDEIS. These include health effects from airborne, water-borne, and other sources related to the NorthMet Project Proposed Action.
SE6	The low-grade character of the ore body is not adequately addressed.	Calculations in the DEIS Socioeconomics Section already take the quality of the ore into account. These inputs are more clearly stated in Section 5.2.10 of the SDEIS.
SE7	The EIS should address whether the NorthMet Project Proposed Action will emphasize hiring of local workers, therefore ensuring economic benefits to local communities.	Please see response to Theme SE3
SE8	The DEIS did not discuss the specifics regarding inputs of the IMPLAN model and other economic data.	The inputs and methodology of the IMPLAN model are described in Section 5.2.10 of the SDEIS.
SE9	The DEIS does not adequately evaluate socioeconomic impacts.	Potential socioeconomic effects on population, housing, employment, transportation, etc., are addressed in Sections 5.2.10 and 5.3.10 of the SDEIS. A Multi-agency (Co-lead and cooperating agencies) Workgroup met during 2011to help define the scope of the socioeconomics analysis.
SE10	The DEIS does not adequately evaluate mineral rights.	Mineral rights for the NorthMet Project Proposed Action are discussed in Section 3.2.2 of the SDEIS.

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	Section: Vegetation (VE)	
VE1	The DEIS does not provide sufficient baseline characterizations of vegetation and other factors related to vegetation, such as groundwater modeling.	Existing conditions, including baseline characterizations and any additional threatened or endangered species listed after the DEIS was released, are discussed in detail in Sections 4.2.4 and 4.3.4 of the SDEIS. Details regarding inputs to modeling are included in resource-specific Sections of SDEIS Chapter 5.
VE2	The DEIS does not adequately address impacts to wild rice, aquatic vegetation, and farming from sulfates, sulfides, mercury methylation, and other constituents.	Effects resulting from vegetation exposure to potentially harmful constituents are discussed in detail in relevant Sections of SDEIS Chapter 5, such as water resources.
VE3	The DEIS reclamation plans are not sufficiently detailed. They do not adequately consider impacts from non-native and invasive species and should instead include native species.	Issues such as the spread of non-native and invasive species and potential effects on vegetation resources are addressed in Section 5.2.4 of the SDEIS. Reclamation plans, revegetation plans (including plant species proposed to be used during closure and reclamation activities), monitoring plans, and potential mitigation measures for the NorthMet Project Proposed Action are discussed in SDEIS Chapter 3.
VE4	The DEIS does not adequately consider the cumulative effect on non-listed flora populations, in addition to threatened and endangered species, in northeast Minnesota from other similar projects, and does not discuss the extent and prevalence of these species in the region.	Cumulative effects on vegetative species, and the metrics used for analysis of potential effects, are discussed in Chapter 6 of the SDEIS.
VE5	The DEIS contains insufficient information to support its discussion of effects to threatened and endangered plant species, nor does it describe a plan to maintain these populations.	Potential effects on state-listed and RFSS plant species are discussed in Sections 5.2.4 and 5.3.4 of the SDEIS. A Biological Evaluation will be developed to address RFSS. There are no federally listed plant species in the NorthMet Project Area.

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VE6	The DEIS does not adequately evaluate tribal utilization of important plant resources (wild rice, cedar, sage, etc.) at the Mine Site and Plant Site, since the Section 106 NHPA consultation was not finished at time of publication and documentation of these uses is often not available or recorded.	Section 106 consultation is ongoing. Potential effects on vegetation and plant species are discussed in Sections 5.2.4 and 5.3.4 of the SDEIS. Tribal utilization of plant species is discussed in the Cultural Resources sections of SDEIS Chapters 4 and 5.
VE7	The DEIS does not adequately identify the proposed organic nutrient amendments to the Tailings Basin and how these would promote the development of shoreline and near-shore aquatic vegetation.	Potential mitigation methods regarding vegetation are addressed in Section 5.2.4 of the SDEIS. This includes revegetation of the Tailings Basin and development of aquatic vegetation. Reclamation plans, revegetation plans, monitoring plans, and potential mitigation measures for the NorthMet Project Proposed Action are discussed in Chapter 3 of the SDEIS.
VE8	The DEIS does not adequately characterize impacts from sulfuric acid formation on vegetation, during transportation of the rock from the Mine Site to the Plant.	Spillage from rail cars is expected to be minimized through the use of mitigation methods such as seals on rail car doors and a different design than previous operations. Effects on vegetation resulting from rail car spillage are discussed in Section 5.2.4 of the SDEIS.
Section: Visual Resources (VI)		
VI1	The DEIS visual impact assessment does not provide sufficient characterizations of baseline conditions or impacts. A visual impact assessment that is comparable to past USACE practices should be provided.	Section 4.2.11 of the SDEIS includes an expanded discussion of baseline visual conditions.
VI2	The DEIS should include a discussion on the potential adverse visual impacts from the introduction of non-native species as a revegetation measure.	This topic is discussed in Sections 5.2.11 and 5.3.11 of the SDEIS.
VI3	The DEIS' conclusions regarding the extent and impacts of light pollution are inadequate.	This topic is discussed in Sections 5.2.11 and 5.3.11 of the SDEIS.
VI4	The DEIS should evaluate the potential for haze and haze-related impacts on the BWCAW as a result of the NorthMet Project Proposed Action.	Haze and related effects are discussed in Section 5.2.7 and 5.2.11.

Theme Code	Theme Statement	Thematic Response
	Section: Wetlands (WE)	
WE1	The DEIS does not adequately characterize the wetland baseline information; the wetland delineation and characterization of wetland areas /species should be reevaluated.	Characterization of wetland resources at the Mine Site has been reevaluated since the DEIS. Existing conditions, including baseline characterizations of wetland resources, are discussed in detail in Section 4.2.3 of the SDEIS. Further details regarding inputs to modeling are discussed in Section 5.2.3 of the SDEIS.
WE2	The DEIS does not adequately characterize the direct and indirect impacts to wetland resources from the NorthMet Project Proposed Action.	Direct and indirect effects on wetland resources from the NorthMet Project Proposed Action are discussed in detail in Section 5.2.3 of the SDEIS. Further analysis of the potential direct, indirect, and cumulative effects on wetland resources has occurred since the development of the DEIS and a Wetlands IAP Workgroup was formed to address the concerns raised on the DEIS. Related discussions are included in other Sections of SDEIS Chapter 5 (such as water resources).
WE3	The DEIS does not adequately address wetland mitigation for the NorthMet Project Proposed Action.	Wetland monitoring plans are discussed in Section 5.2.3 of the SDEIS. Wetland mitigation methods, including wetland ratios and justification for mitigation site locations, are also addressed in Section 5.2.3. PolyMet has now proposed a compensatory wetland mitigation site in the St. Louis River Watershed and one in an adjacent watershed, in addition to the two other sites identified in the DEIS.
WE4	The DEIS provides insufficient information to demonstrate compliance with federal and state wetland permitting requirements.	Existing wetland habitat, including wetland/habitat quality, is described in Sections 4.2.3 and 4.3.3 of the SDEIS. Effects on wetland resources at the Mine Site and Plant Site are included in Section 5.2.3 of the SDEIS. This discussion includes (where applicable) information to show how the effects of the NorthMet Project Proposed Action compare with federal and state wetland permitting requirements, which includes justification for mitigation site locations.
WE5	The DEIS does not adequately address the cumulative effects for wetland resources and the analysis should be redone.	Further analysis of the potential cumulative effects on wetland resources has occurred since the development of the DEIS and a Wetlands IAP Workgroup was formed to address the concerns raised in the DEIS. Cumulative effects on wetland resources, and the metrics used for analysis of potential effects, are included in Chapter 6 of the SDEIS.

Theme Code	Theme Statement	Thematic Response
WE6	The DEIS does not adequately analyze the effectiveness of the wetland treatment system (i.e., WWTF and passive wetland treatment system) and the potential for a longer duration. The SDEIS needs to further analyze the effectiveness and possibility for a longer duration.	Further analysis of the potential effects on wetland resources has occurred since the development of the DEIS, including formation of a Wetlands IAP Workgroup to address the concerns raised in the DEIS. The NorthMet Project Proposed Action no longer includes a wetland treatment system. See Chapter 3 for a description of the mechanical wastewater treatment systems planned for the Plant Site and Mine Site, as well as other wetland monitoring plans. Wetland monitoring plans and other wetlands effects are discussed in Section 5.2.3 of the SDEIS.
WE7	The DEIS does not adequately address the value of wetlands since the Land Exchange Proposed Action was not included in DEIS and the covenants on the Mine Site (Weeks Act) are being ignored.	Information on the Land Exchange Proposed Action, including conformance to the Weeks Act, Federal Land Policy and Management Act, the Forest Plan, and EOs 11998 and 11990 are included in Chapter 1 and Section 5.3.3 of the SDEIS.
WE8	The DEIS is inadequate in demonstrating how the water quality and release of mercury would impact wetlands.	Since publication of the DEIS, additional analysis of indirect wetland effects has been conducted, including effects on wetland water quality. A Wetlands IAP Workgroup was formed to address concerns raised in the DEIS. Potential wetland effects associated with degraded water quality and mercury release from the NorthMet Project Proposed Action have been further evaluated, and further analysis of potential effects on wetland resources has been conducted since the development of the DEIS. These effects are discussed in detail in Sections 5.2.3 and 5.3.3 of the SDEIS, and in related Sections of SDEIS Chapters 4 and 5 (such as water resources).
Section: Wildlife (WI)		
WI1	The DEIS does not adequately incorporate the findings of biological assessments or comments prepared by other agencies (USACE, USFWS, USFS) related to impacts on threatened and endangered species or RFSS.	A BA and Biological Evaluation will be developed to address federally listed and RFSS, respectively. Discussions of potential effects on federally listed, state-listed, and Regional Forester Sensitive Species (wildlife) are included in the Vegetation and Wildlife Sections of SDEIS Chapter 5.

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WI2	The DEIS does not adequately analyze the direct and indirect effects (including habitat loss) on wildlife species including special-status species (e.g., endangered species). More surveys need to be completed for these species, and more emphasis should be placed on the effect on specific areas such as the 100-mile Swamp and Mud Lake/Yelp Lake.	Please see response to Theme WI1. Updated special-status species lists are included in Sections 4.2.5 and 5.2.5 of the SDEIS. Additional wildlife surveys were completed for the non-federal land exchange parcels and are discussed in Sections 4.3.5 and 5.3.5 of the SDEIS.
WI3	The DEIS does not adequately evaluate tribal utilization of important and treaty-protected wildlife species (moose, furbearer species, etc.), because the Section 106 NHPA consultation was not finished at time of publication and documentation of these uses is often not available or recorded.	Section 106 consultation is ongoing. Discussion of potential effects on wildlife species is included in Sections 5.2.5 and 5.3.5 of the SDEIS. In addition, potential effects on 1854 Treaty resources have been addressed in Sections 4.2.9 and 5.2.9.
WI4	The DEIS does not adequately consider the cumulative effect on non-listed wildlife populations (in addition to threatened and endangered species) in northeast Minnesota from other similar projects, including synergistic impacts of bioaccumulation of contaminants.	Cumulative effects on wildlife species, including RFSS and SGCN, are discussed in Chapter 6 of the SDEIS. Further discussion of reclamation and post-closure activities are discussed in Chapter 3 of the SDEIS. Non-federal lands to become federal/public are addressed in topic-specific discussions in Section 5.3 and Chapter 6 of the SDEIS. Mitigation for and restoration of wildlife corridors is discussed in Chapter 6 of the SDEIS.
WI5	The DEIS does not adequately address the habitat value of quality for restored wetlands, particularly the Hinckley and Aitkin sites. These would not offer the same habitat for northern wildlife species since they are located so far south.	Existing wetland habitat, including wetland/habitat quality, is described in Sections 4.2.3 and 4.3.3 of the SDEIS. Wetland mitigation methods, including justification for mitigation site locations, are addressed in Sections 5.2.3, 5.3.3, and Chapter 7 of the SDEIS.

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	Section: Water Resources (WR)	
WR1A	The plan for post closure management to prevent pollution of groundwater or surface water is inadequate or unclear and given the inherent uncertainty in hydrology and geochemistry, and the Mine's long term potential to degrade water quality. The post-closure plan should include contingencies, mitigation strategies, and a detailed reclamation plan and financial assurances.	The Proposed Action has changed substantially since preparation of the 2009 DEIS and water quality modeling has been revised accordingly. PolyMet has developed Adaptive Water Management Plans that include contingencies and mitigation strategies if actual water effects turn out to be greater than modeled. Post-closure management is addressed in Section 3.2.2 and Chapter 7 of the SDEIS. During plant closure activities, demolition and reclamation of Plant Site infrastructure would be completed according to federal, state, and local agency permits and regulations. Financial assurance for closure and remediation of the NorthMet Project Proposed Action is addressed in Chapter 3 of the SDEIS. A Co-lead agency document dated August 23, 2011, describes the mechanism for addressing financial assurance in the SDEIS.
WR1B	The overall NorthMet Project Proposed Action monitoring plan for water quality is not adequate or described in sufficient detail.	Monitoring is addressed in detail in Section 5.2.2.3.6 of the SDEIS. Groundwater specific monitoring points will be located to evaluate the accuracy of predicted water quality effect. These prediction points were selected based on groundwater flow paths between Mine Site facilities (e.g., waste rock, tailings, pits, etc.) and the nearest surface waters (i.e., the Partridge River and Embarrass River). Surface water quality must be monitored and water quality standards met in all Embarrass River and Partridge River tributaries and main branches of these rivers, as determined by the MPCA.
WR1C	Leaching of contaminants from waste rock stockpiles is problematic.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS. The most reactive waste rock will be temporarily stored on liners, then placed in the East Pit and flooded with water before closure. Discussions of water resources effects (Section 5.2.2 of the SDEIS) account for temporary pollutant release by leakage through these liners. The less-reactive Category 1 waste rock pile that remains permanently on the surface will be surrounded with a water containment trench to capture seepage during and after mining. Water captured in the trench would be treated. A proposed geosynthetic cover would decrease water infiltration. The issue is addressed in Sections 3.2.2 and 5.2.2 of the SDEIS.

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WR1D	The potential for pollution from railroad car ore spillage needs analysis.	The estimate of water quality effects in the SDEIS includes the release and transport of pollutants from ore spilled from rail cars. A monitoring plan for characterization of background water quality and evaluation of effects during operations has been developed. Mitigation strategies are part of the monitoring plan. Sections 4.2.2 and 5.2.2 of the SDEIS address this issue.
WR1E	Studies and sampling were inadequate to assess and characterize baseline conditions of acid mine drainage, pollution (including sulfates, mercury, and methyl mercury), groundwater (including flows), surface water, wetlands, wild rice, wildlife, and financial risks. As a result, the impact analysis of the NorthMet Project Proposed Action is inadequate.	Environmental sampling and analysis has continued into 2012, expanding the set of baseline environmental data since the 2009 DEIS. Updated baseline environmental conditions are presented in Section 4.2.2 (water quality, wild rice, and mercury), and Section 4.2.3 (Wetlands). The water quality model used to estimate effects of the project has been calibrated to these current conditions, and the deviation between the calibrated models and observed conditions are considered as one measure of prediction uncertainty (Section 5.2.3).
WR1F	The proprietary models of pollutant production and transport cannot be independently evaluated.	The proprietary models used in the DEIS to estimate the release and transport of pollutants under NorthMet Project Proposed Action have been replaced in the SDEIS with a model that, though still proprietary, is essentially transparent and can be viewed and executed independently. The technical review included independent assessment to confirm that the model used the parameter values agreed upon by the Co-Lead Agencies, and that the major model results could be reproduced using independent calculations. See Section 5.2.2 of the SDEIS.
WR2A	The hydrogeology of the NorthMet Project site is not well understood. Therefore, the DEIS cannot reliably determine reliably aquifer drawdown from dewatering or whether pollutants from the Mine could travel in groundwater and degrade water in wells, lakes or rivers.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and water balance studies. In particular, the number of wells used to characterize the Mine Site alluvium (the main area affected by dewatering) has been increased (Section 4.2.2), and the new information on water levels and water quality gained from these data have been used in the calibration of the updated water quality model (Section 5.2.2).
WR2B	Climate change could increase (beyond assumptions in the DEIS) the volume of water flowing through the Mine causing increased transportation of pollutants in surface and groundwater.	This issue is addressed in Sections 5.2.2 and 5.3.2 of the SDEIS. Estimates of pollutant transport from the NorthMet Project Proposed Action use results of "down-scale" climate models (i.e., nested models that refine the estimated effect of climate change on local water balance using larger-scale model results) to estimate the range in pollutant migration from mine waste. The effects of extremely wet periods are included in the modeling.

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WR2C	Pollutants released by the NorthMet Project Proposed Action could contaminate groundwater. These effects need to be estimated.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and water quality modeling has been revised accordingly. Estimating the rate at which pollutants from mine waste could leach into groundwater is given high priority in the SDEIS modeling and is specifically discussed in Section 5.2.2 of the SDEIS. Pollutant concentrations in groundwater were estimated using probabilistic models; descriptions of predicted effects on groundwater and surface water quality are presented along with a discussion of uncertainty in model parameters.
WR2D	The liners under waste rock and waste facilities and /or hydrometallurgical waste cells may fail over time and may need to be replaced.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and the SDEIS has changed accordingly. In particular, the lowest-sulfide (Category 1) waste rock that will be permanently stored in unlined facilities will be surrounded completely by a groundwater containment system that will capture seepage during and after mining to prevent discharge before it has been treated to meet discharge standards. After closure, the Category 1 waste rock will be covered with a geomembrane to reduce water percolation and pollutant transport. The more reactive (Category 2, 3, and 4) rock will be stored temporarily in lined facilities, before being placed in the East Pit for permanent stabilization under the water table. Hydrometallurgical waste will be blended with lime to reduce metal solubility prior to disposal, and this material will be placed in double-lined facilities, which have been shown to have negligible leakage.
WR2E	The model of pollutant transport from Mine Site facilities to groundwater and surface water does not adequately represent the NorthMet Project Proposed Action. The model does not adequately consider water flow through the Mine Site, all of the chemical constituents that may be leached from mine waste, or the known mechanisms of pollutant release and transport at hard rock sulfide mines.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and water quality modeling has been revised accordingly. Estimating the rate at which pollutants from mine waste could leach into groundwater is given high priority in the SDEIS modeling and is specifically discussed in Section 5.2.2 of the SDEIS. The SDEIS expands the number of constituents included in the modeling from eight in the DEIS to 20 to include all inorganic constituents with drinking water standards. Pollutant concentrations in groundwater were estimated using probabilistic models. Descriptions of predicted effects on groundwater and surface water quality are presented along with a discussion of uncertainty in model parameters.

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WR2F	The WWTF may not be able to adequately treat Mine Site water to meet discharge standards and there is no contingency for this. It is also unclear whether the WWTF would treat nitrates.	The state has reviewed the WWTF effluent water quality targets provided by PolyMet and, based upon currently available data, including RO pilot results, believes these targets could be met. Nitrates would be treated if they are included in the discharge permit. The WWTF will also be of modular construction, such that additional modules can be added for increased capacity if necessary.
WR2G	The water quality models for the NorthMet Project Proposed Action produced recharge rates through the glacial till that seem implausible, based on USGS data. This should be reconciled by measuring recharge from water table wells and including recharge from all pathways, including meteoric water.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and water quality modeling has been revised accordingly. Water quality modeling is specifically addressed in Section 5.2.2 of the SDEIS. Hydraulic characteristics of the glacial till, including hydraulic conductivity and recharge, were refined by reviewing data (including specific measurements of recharge through surficial till) from two nearby mines with similar hydraulic and geologic settings.
WR2H	Many of the wetlands in the NorthMet Project area may be hydraulically connected to groundwater, contrary to the assumption in the DEIS. Air photo interpretation is inadequate to assess impacts on wetlands and Mud Lake. Empirical data used to address indirect wetland impacts needs better disclosure in the EIS.	The potential for indirect wetland effects at the Mine Site is discussed in Section 5.2.2 of the SDEIS. This discussion is refined and expanded, compared to the 2009 DEIS, in particular by evaluating the effects of dewatering at two nearby mines with similar bedrock and surficial geologic conditions.
WR2I	The point selected to evaluate impacts to surface or groundwater is inappropriate.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and water quality modeling, proposed monitoring points, and proposed model evaluation points have been revised accordingly. Water quality monitoring is specifically addressed in detail in Section 5.2.2.3.6 of the SDEIS. For groundwater, specific monitoring points will be located to evaluate the accuracy of predicted water quality effect. These prediction points were selected based on groundwater flow paths between Mine Site facilities (e.g., waste rock, tailings, pits, etc.) and the nearest surface waters (i.e., the Partridge River and Embarrass River). The surface water quality modeling includes 18 evaluation points along the main branch of the Embarrass River, its tributary streams, and the main branch of the Partridge River, plus one evaluation point in Colby Lake.

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WR2J	The evapotranspiration capability of the vegetated soil layer on the stockpiles has not been demonstrated.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and no longer includes permanent stockpiles of Category 2, 3, or 4 waste rock where minimizing infiltration is important. The Category 1 Stockpile would be covered by a geomembrane liner, thereby dramatically reducing infiltration and the need to accurately model evapotranspiration. Section 5.2.2 of the SDEIS addresses this issue.
WR3A	The evaluation of tailings discharges is inadequate as there is a significant potential for oxidation from the tailings slurry discharge beach and the tailings pond, winter effects on tailings oxidation need better definition, and water quality and quantity leaving the tailings basin may be problematic, especially in the case of flooding.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and water quality modeling has been revised accordingly. Water quality modeling is specifically addressed in Section 5.2.2 of the SDEIS. In addition, the SDEIS now uses a more robust probabilistic modeling approach that incorporates current data and information to present sufficient additional analysis. Finally, the flotation tailings will now be surrounded with a water containment system to capture seepage for storage and eventual treatment prior to discharge. Sections 3.2.2 and 5.2.2 of the SDEIS address this issue.
WR3B	There are concerns about water quality effects beyond the immediate NorthMet Project area, including BWCAW, the overall St. Louis River Watershed, and Lake Superior.	There is no groundwater seepage or surface water drainage from the NorthMet Project area to the BWCAW or its waters. Groundwater seepage and surface runoff from the NorthMet Project area drains to either the Partridge River or the Embarrass River, both of which are tributaries of the St. Louis River and Lake Superior. All seepage and surface water runoff must meet applicable water quality standards at or before the property boundary. Section 5.2.2 of the SDEIS addresses this issue.
WR3C	The DEIS' finding that there will be no surface water discharge is incorrect. The final EIS should acknowledge the application of NPDES permits to a variety of pathways for surface water discharge and to assess the potential for each, including the West Pit outflow.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and the SDEIS has changed accordingly. There will be groundwater seepage from the Tailings Basin and the East Pit after it fills with water. These seepages (which are quantified in Section 5.2.2 of the SDEIS) will eventually become surface water draining to tributaries of the Embarrass River and Partridge River. All applicable groundwater and surface water standards must be met. There may also be direct discharge from the WWTF, which would require a NPDES permit, if there is excess water after make-up water needs are met. Beginning in approximately year 40, there could also be direct discharges from the West Pit Overflow; this discharged water would be treated at the WWTF prior to diversion into the West Pit.
WR3D	The NorthMet Project Proposed Action could result	The NorthMet Project Proposed Action has changed substantially since preparation of

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	in AMD and the potential for additive toxicity to Lake Superior.	the 2009 DEIS. There is a discussion on the potential for effects as it pertains to the impaired status of the St. Louis River (which flows into Lake Superior) and/or the TMDL process in Section 5.2.2 and Chapter 6 of the SDEIS. See also response to theme WR3C.
WR3E	Water level changes in the Partridge River and Embarrass River and wetlands downstream of the tailing basin needs quantifying.	Changes in streamflow to the Partridge River and Embarrass River were modeled for the 2009 DEIS, and that modeling was revised for the SDEIS to reflect substantial changes in the NorthMet Project Proposed Action. These changes are addressed in Section 5.2.2 of the SDEIS. The small reduction in streamflow due to the NorthMet Project Proposed Action will result in an imperceptible change in river water level.
WR3F	Water quality and quantity impacts to Colby Lake and Hoyt Lakes' municipal water supply need better analysis. The DEIS should have discussed the following related issues: development of a TMDL or Manganese criterion for Colby Lake; effects on Colby Lake's water levels; quantity of water pumped to the WWTP; and levels of metals removal, including iron reduction, achieved by the Hoyt Lakes treatment plant.	These issues are addressed in Section 5.2.2 of the SDEIS. Colby Lake is one of the water quality modeling evaluation points downstream of the Mine Site. Effects on Colby Lake are discussed in Section 5.2.2.3.2.
WR3G	In reference to lining the exposed Virginia Formation along the East Pit's north wall, literature citation notes that lime increases pH which, in turn, increases release of arsenic. The relationship between arsenic solubility and liming should be addressed.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS. As described in Chapter 3 and Section 5.2.2 of the SDEIS, the more reactive waste rock and overburden would be backfilled to the East Pit, covering the Virginia formation, and would be permanently stored subaqueously, minimizing oxidation and the subsequent release of contaminants. Lime could be added to the East Pit during backfilling, as needed, in order to maintain circumneutral pH in the pit pore water, which would be pumped to the WWTF and returned to the East Pit as required to manage potential pollutant load. The volume of lime required would be determined through monitoring.
WR3H	The DEIS needs to model for dissolved aluminum, not total, since dissolved is the standard.	*Minnesota Rules* 7050.0222 Subpart 1.B states that in the absence of a listed conversion factor for a particular metal to convert total to dissolved, the applicable conversion factor is one. Aluminum is not listed in Subpart 9; therefore, its conversation factor is one. That means, practically speaking, that total equals dissolved; therefore, modeling

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		total aluminum is acceptable. Since the dissolved form of a metal, by definition, cannot be greater than the total metal, using total aluminum in the modeling can be considered conservative. Modeling criteria for aluminum and other constituents are discussed in Section 5.2.2.1.2, while future concentrations of aluminum are discussed in Section 5.2.2.3.2 (Partridge River) and Section 5.2.2.3.3 (Embarrass River).
WR3I	There are potential exceedances of water quality standards due to the NorthMet Project Proposed Action, even after WWTF treatment. To demonstrate compliance with all applicable standards and regulations, the EIS should present additional analysis, suggest alternative designs and methods to prevent contamination that exceeds water quality standards, and should use more rigorous Impact Criteria imposed by downstream impaired waters (including TMDL and nondegradation criteria) for al chemicals on the GLI list.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and water quality modeling has been revised accordingly. Water quality modeling is specifically addressed in Section 5.2.2 of the SDEIS. In addition, the SDEIS now uses a more robust probabilistic modeling approach that incorporates current data and information to present sufficient additional analysis to compare predicted effects against applicable standards and regulations. Specific (i.e., numeric) evaluation criteria related to sulfate and methylmercury for the impaired portion of the St. Louis River do not exist. Section 5.2.2 of the SDEIS therefore discusses potential methylmercury-related effects in downstream impaired waters qualitatively.
WR3J	Lack of on or near-site streamflow data makes the DEIS' impact assessment questionable.	The Co-lead Agencies are comfortable with the modeling approach used for hydrologic impact assessment, especially since data collected during recent winters confirms that the model's baseflow estimates are conservatively low. It is also important to note that the total watershed area consumed within the NorthMet Project area is less than 7 percent at any location along the Partridge River, meaning that actual changes in streamflow will be very small. One or more permanent gauging stations along the Partridge River will be required during operations to aide in the determination of compliance with water quality standards.
WR3K	Ditches and dikes are not 100 percent effective. The materials used in ditch and storm water leachate collection systems must preclude seepage and be resistant to freeze/thaw cycles.	It is understood that the ditches and dikes that are part of the Category 1 Stockpile seepage collection system are not 100 percent effective. However, they will be engineered to an acceptable level of efficiency considering the low reactive potential of the Category 1 waste rock, and the modeling used to estimate project effects on water quality have assumed leakage rates observed in similar systems. This issue is addressed in Sections 3.2.2 and 5.2.2 of the SDEIS.

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WR3L	Wetland treatment in the East Pit is inadequate for water treatment.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and water quality modeling has been revised accordingly. Water quality modeling is specifically addressed in Section 5.2.2 of the SDEIS.
WR3M	The DEIS fails to analyze the impacts to water quality from the local deposition and run-off of metal emissions.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and water quality modeling has been revised accordingly. Water quality modeling is specifically addressed in Section 5.2.2 of the SDEIS. In addition, the SDEIS now uses a more robust probabilistic modeling approach that incorporates current data and information to present sufficient additional analysis. Projected mercury emissions from the Plant Site have been subjected to an AERA, where potential mercury-related risks were assessed for fishing and subsistence users, where chronic risks are based on fish consumption. The findings of the agency-approved AERA are presented in the SDEIS.
WR3N	The potential effects of the NorthMet Project Proposed Action on wetlands, bogs, and peatlands were not adequately evaluated in the DEIS.	Please see response to Theme WR3M.
WR4A	The modeling used for the DEIS must consider mercury methylation and provide a quantitative analysis of the discharge of mercury from all pathways during and after mining based on realistic data. Modeling should also consider estimates of expected variation in measures under varied conditions (e.g., fluctuating water levels in reservoirs and flood plains).	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and water quality modeling has been revised accordingly. Water modeling is specifically discussed in Section 5.2.2 of the SDEIS. The SDEIS gives high priority to estimating the rate at which pollutants from mining waste (e.g., tailings, waste rock, stockpiled ore, pit-wall rock, and hydrometallurgical process residue) could leach into groundwater. To ensure that the analysis for the SDEIS identified a realistic range for possible effects on water quality, the Water Resources IAP Workgroup identified ranges for values of most parameters used to estimate pollutant migration. The model of pollutant dissolution and migration considers water percolation rates through mine waste, leakage rates through lined facilities, and uses empirical tests on project materials to estimate dissolution rates for sulfide minerals and chemical attenuation by adsorption and precipitation (see Section 5.2.2.2.3). Quantitative modeling of methylmercury is beyond the scope of the SDEIS, due to the inherent complexity of the fate and transport of methylmercury in the environment. However, the potential for enhanced methylation of mercury and uptake in fish as a result of project discharges is qualitatively addressed in the SDEIS.

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WR4B	The DEIS fails to adequately address impacts of mercury and methylmercury, particularly on fish and humans. The DEIS should include an analysis of the impacts of methylmercury on fish communities, as well as on people and wildlife that consume the fish, social and economic impacts to fisheries, groundwater, surface water, wetlands, and sensitive areas and waterbodies with existing mercury impairments. The EIS should also explain why the addition of sulfates from the NorthMet Project Proposed Action will not result in additional mercury pollution, how the St. Louis River Watershed will be able to attain TMDL standards, and the potential for mercury demethylation and/or methylation in flooded mine pits.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS and water quality modeling has been revised accordingly. Estimating the rate at which pollutants from mining waste could leach into groundwater is given high priority in the SDEIS modeling and is specifically discussed in Section 5.2.2. Pollutant concentrations in groundwater were estimated using probabilistic models. Descriptions of predicted effects on groundwater and surface water quality are presented along with a discussion of uncertainty in model parameters. The SDEIS specifically addresses possible effects on people, fisheries, and wildlife based on the estimates of pollutant concentrations from the models. Quantitative modeling of methylmercury is beyond the scope of the SDEIS, due to the inherent complexity of the fate and transport of methylmercury in the environment. However, the potential for enhanced methylation of mercury and uptake in fish as a result of NorthMet Project Proposed Action discharges are qualitatively addressed in the SDEIS.
WR4C	Monitoring, mitigation measures, and contingency responses for pollutant releases (especially sulfate and mercury) are inadequately described in the DEIS. The DEIS should explain how exceedances of these materials are to be regulated, define the goal of maintenance-free closure, and any financial safeguards that are in place to address future problems to water and soil as a consequence of industrial action.	These issues are addressed in Chapters 3 and 7 of the SDEIS. Under the SDEIS, the Category 1 waste rock facility and the Tailings Basin will be surrounded by containment systems to capture and treat seepage to reduce the pollutant load to groundwater. Groundwater monitoring points will be located to evaluate the accuracy of predicted water quality effect. During mine closure, the East Pit would be reclaimed as a wetland and the West Pit would flood with water to become a pit lake. Water from the West Pit will be treated as necessary at the WWTF and returned to the West Pit, or discharged to the Partridge River at concentrations that meet pollutant concentration thresholds. During post-closure, the WWTF will be used, as necessary, to treat effluent from the West Pit Lake, the Category 1 waste rock and the Tailings Basin to meet surface water quality standards before it is discharged. The WWTF will be run as long as necessary during operations and closure, until passive treatments are adequately demonstrated to meet water quality standards. During plant closure activities, demolition and reclamation of Plant Site infrastructure would be completed according to federal, state, and local agency permits and regulations.
WR4D	The permitting of the NorthMet Project Proposed Action would violate the Great Lakes Compact of	This issue is addressed in Chapter 1 of the SDEIS. Applicability of the Great Lakes Initiative is also discussed in Sections 5.2.2.1.2 (Evaluation Criteria), and Sections

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	zero discharge of mercury to the basin and federal or state regulations that prohibit mixing zones (40 C.F.R. § 132, Appendix F, Procedure 3; Minn. R. 7052.0210, Subp. 3). The more rigorous Impact Criteria imposed by the downstream impaired waters and TMDL status and nondegradation under *Minnesota Rules* 7050 and 7052 should be used instead of the Great Lakes Initiative.	5.2.2.3.4 (Mercury). The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS, and water quality modeling has been revised accordingly. The SDEIS will use a more robust probabilistic modeling approach that incorporates current data and information to present sufficient additional analysis to compare predicted effects against applicable standards and regulations. Specific (i.e., numeric) evaluation criteria related to sulfate and methylmercury for the impaired portion of the St. Louis River does not exist. The SDEIS discusses potential methylmercury-related effects in downstream 'impaired' waters qualitatively in the Chapter 5 of the SDEIS. The water quality evaluation criteria in the SDEIS include the Lake Superior mercury standard.
WR4E	Sequestration of mercury by soil, peatlands, and/or minerals is not adequately discussed in the DEIS. The EIS should include quantitative information on mercury sequestration from the MDNR study.	This issue was addressed in the DEIS. The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS. The SDEIS uses a more robust probabilistic modeling approach that incorporates current data and information to present sufficient additional analysis. Quantitative modeling of mercury transport is beyond the scope of the SDEIS, due to the inherent complexity of the fate and transport of methylmercury in the environment. However, the potential for enhanced methylation of mercury are addressed in the SDEIS.
WR4F	The NorthMet Project Proposed Action could potentially elevate sulfate concentrations above the 10 mg/L wild rice standard and could promote AMD with potential impacts on the health of aquatic vegetation, especially wild rice beds, which have significant cultural and ecological value. The EIS should thoroughly evaluate impacts on wild rice standards.	The NorthMet Project Proposed Action has changed substantially since preparation of the 2009 DEIS. The MPCA staff have made a draft recommendation that portions of the Partridge River downstream of the Mine Site be treated as waters used for the production of wild rice, meaning that the 10 mg/L sulfate evaluation criterion would apply to these reaches from April 1 to August 31. The NorthMet Project Proposed Action includes controlled outflow from the West Pit to comply with this standard. Modeling of the NorthMet Project Proposed Action indicates that sulfate concentrations in tributaries north of the basin and at PM-13 would decrease in comparison to the Continuation of Existing Conditions modeling scenario. These aspects of the NorthMet Project Proposed Action are described in Chapter 3, Chapter 7, and Section 5.2.2 of the SDEIS.
WR5A	Inadequate consideration has been given to the long-term impact of mercury and sulfate emissions from the NorthMet Project Proposed Action, in combination with other cumulative impacts, on	This issue is addressed Chapter 7 of the SDEIS. The estimates of effects from the NorthMet Project Proposed Action include release of sulfate and mercury from mine waste to groundwater and surface water. Additional mitigation described in the SDEIS includes groundwater containment systems around the Category 1 waste rock and

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	water resources (including groundwater, water supplies, exceedances of water quality standards, metal leaching, flow fluctuations, and hardness), wetlands, wild rice beds, changes in cover, and hydrology.	Tailings Basin. Also, Category 1 waste rock will be covered with a geosynthetic layer to reduce infiltration, and the Tailings Basin surface and slopes would be amended with bentonite to reduce oxygen and water flow and thus reduce pollutant releases. The tailings system is designed with a goal of eventual discontinuation of groundwater seepage collection.
WR5B	The cumulative impacts of the NorthMet Project Proposed Action with other mining projects must be addressed, especially the capacity of the rivers to assimilate wastewater effluent.	This issue is addressed Chapter 6 of the SDEIS.
WR5C	The applicant's assessment of uniquely affected communities is incorrect and cumulative effects of the NorthMet Project Proposed Action on health and biological resources, including wild rice, and wildlife populations (e.g., fish, moose), must be considered. These impacts could disproportionately affect minority communities, low income persons, and Indian tribal members, whose diets rely on fish to a greater extent than their non-Indian neighbors.	These concerns are addressed in the topic-specific portions of Chapter 6 of the SDEIS, including Water Resources, Wildlife, Fish and Macroinvertebrates, and Socioeconomics.

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