GRAND PORTAGE BAND OF CHIPPEWA
ENVIRONMENTAL DEPARTMENT
P.O. Box 428, Grand Portage, MN 55605

BY EMAIL ONLY

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Re: Grand Portage Band's Comments on PolyMet's November 2013 Supplemental Draft Environmental Statement for the NorthMet Project and 404 Wetlands Permit Notification.

Dear Ms. Fey, Mr. Bruner, and Mr. Jimenez:

The Grand Portage Band of Chippewa (the "Band") hereby submits these comments in connection with the NorthMet Project (the "Project") November 2013 Supplemental Draft Environmental Impact Statement ("SDEIS"), notice of which was published in the Federal Register on December 13, 2013, and the Clean Water Act ("CWA") Section 404 Wetlands Permit Notification (with corresponding CWA Section 401 Certification). There was a prior, October 2009 Draft EIS ("DEIS") on which the Band also offered many of the same comments to the co-lead agencies (then including only USACE and MNDNR--the USFS joined later),

collectively the "Co-Leads," and those comments (along with all exhibits) are incorporated by reference and reaffirmed here.[1]

Introduction

The Band is a federally recognized Indian tribe, as one of the member bands of the Minnesota Chippewa Tribe ("MCT"). The Band is a cooperating agency on the Project, along with other MCT-member Bands, Fond du Lac and Bois Forte. All the Bands involved retain hunting, fishing, and other usufructuary rights that extend throughout the entire northeast portion of the state of Minnesota under the 1854 Treaty of LaPointe[2] (the "Ceded Territory"). In the Ceded Territory, all the Bands have a legal interest in protecting natural resources and all federal agencies share in the federal government's trust responsibility to the Bands to maintain those treaty resources.[3]

The issuance of a proper draft environmental impact statement has already been long delayed—the Final Scoping Decision came out more than eight years ago. Regardless of the time taken to prepare it, the Band is reissuing many of the same comments on the SDEIS that it has issued on the last DEIS calling for basic evaluation of Project impacts and application of well-established CEQ standards for EIS preparation, and incorporates all those comments by reference here.[4] Regardless of the complexity of the Project and many changes in Project proposals over the past four years, and despite the preparers' own delays, the co-lead agencies have refused to extend the 90-day comment period on the SDEIS, despite repeated requests. This will only contribute to serious problems in correcting the gaps and defects in analysis in this lengthy SDEIS.

The National Environmental Policy Act ("NEPA")[5] requires that an EIS at least discuss mitigation measures with "sufficient detail to ensure that environmental consequences have been fairly evaluated."[6] With the current SDEIS, such evaluation is impossible. The SDEIS does not

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[1] *See* Band's Cmts. on PolyMet DEIS (Feb. 3, 2010) and Exs. A-NN. CDs containing these documents are submitted to all Co-Leads by U.S. Mail under separate cover.
[2] Treaty with the Chippewa, 1854, 10 Stat. 1109, in Charles J. Kappler, ed., *Indian Affairs: Laws and Treaties*, Vol. II (Washington: Government Printing Office, 1904), available on-line at http://digital.library.okstate.edu/kappler/Vol2/treaties/chi0648.htm (last visited Mar. 10, 2014).
[3] *See, e.g.*, Exec. Order 13175—Consultation and Coordination With Indian Tribal Governments (Nov. 6, 2000) (stating "the United States has recognized Indian tribes as domestic dependent nations under its protection . . . .," there is a "trust relationship with Indian tribes," and "[a]gencies shall respect Indian tribal self-government and sovereignty, honor tribal treaty and other rights, and strive to meet the responsibilities that arise from the unique legal relationship between the Federal Government and Indian tribal governments.").
[4] *See* Band's Cmts. on DEIS at Ex. A (Band's Cmts. on June 2008 PDEIS) and Ex. B (Band's Cmts. on Jan. 2009 PDEIS).
[5] *See* 42 U.S.C. §§ 4321 *et seq.*; *see also* 40 C.F.R. §§ 1500.1 *et seq.*
[6] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 337 (1989).

take the required "hard look" at all the environmental consequences of the Project, including polluting surface and groundwater resources and drying up or inundating thousands of acres of wetlands in the 1854 Ceded Territory. Without adequate study of the adverse effects and determination of possible mitigation measures, the SDEIS still does not provide sufficient information for either public review or agency decision making. The lead agencies must significantly supplement the SDEIS and provide a full opportunity for agency and public review before issuing a final EIS.

I. The SDEIS lacks sufficient characterization of existing and predicted impacts analysis.

A. Financial assurance.

The need to provide such financial assurance on projects like these is widely acknowledged. The General Accounting Office ("GAO"), in testimony before the Senate Committee on Energy and Natural Resources entitled "Hardrock Mining: Information on Abandoned Mines and Value and Coverage of Financial Assurances on BLM Land," presented findings that in total, the federal government spent at least $2.6 billion to remediate hardrock mine sites from 1998 to 2007, highlighting the need for adequate financial assurance.[7] The EPA recently identified mines as a priority class of facilities for which to develop financial responsibility requirements.[8] In 2009, as part of the largest environmental damage bankruptcy case in U.S. history, the mining company ASARCO was ordered to pay $194 million to resolve environmental liabilities from operations that contaminated land, water, and wildlife resources on federal, state, tribal, and private land.[9] The State of Minnesota has spent millions of dollars remediating mine sites (e.g. Reserve Mining).[10]

In order to determine the impacts of a mine, the effectiveness of closure and reclamation after the mine is no longer in use must be assessed.[11] But in the SDEIS, there is no discussion

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[7] GAO-08-574T (Mar. 12, 2008), available on-line at http://www.gao.gov/new.items/d08574t.pdf (last visited Mar. 10, 2014).

[8] EPA Advance Notice of Proposed Rulemaking, Priority Classes of Facilities for Development of CERCLA Section 108(b) Financial Responsibility Requirements, 75 Fed. Reg. 816 (Jan. 6, 2010).

[9] Dept. of Interior News Release, "ASARCO Settlement Provides $194 Million for Federal, State and Tribal Wildlife and Habitat Resource Restoration" (Dec. 10, 2009), available on-line at http://www.fws.gov/pacific/news/2009/ASARCOSettlementNR.pdf (last visited Mar. 10, 2014).

[10] *See, e.g.*, Greg Vandegrift, KARE 11 News, "The Dirty Legacy of Reserve Mining" (Nov. 29, 2006), available on-line at http://www.kare11.com/video/1441334525001/1/The-dirty-legacy-of-Reserve-Mining (last visited Mar. 10, 2014).

[11] Band's Cmts. on DEIS at Ex. E (EPA, Office of Solid Waste and Emergency Response, Financial Assurance for Hardrock Mine Cleanup (2007), Training Doc.); *see also* EPA Advance Notice of Proposed Rulemaking, Priority Classes of Facilities for Development of CERCLA Section 108(b) Financial Responsibility Requirements, 75 Fed. Reg. 816 (Jan. 6, 2010).

regarding the type of financial assurance that would be used. No detail is provided regarding the estimated amount of financial assurance that would be sufficient for reclamation, closure, mitigation, and remediation of adverse effects from the Project. Even though the MNDNR has stated that PolyMet financial assurance will include clean-up costs for contamination resulting from LTVSMC operations,[12] the SDEIS provides no discussion regarding financial assurance for the existing contamination associated with previous mining activities at the site. This is of particular concern because the hardrock mining industry has a pattern of failed operations, which often require significant environmental responses that cannot be financed by industry.[13]

In the SDEIS's evaluation of the underground mining alternative, the North Met Deposit is characterized as a "low- to medium-grade mineral resource,"[14] a far cry from the "one of the largest untapped deposits of copper and nickel, and other precious metals" or "world class resource" that is repeated throughout the SDEIS and in media coverage. The distinction is critical, as mining must provide sufficient profit to cover costs for adequate environmental protections and financial assurance. The financial assurance for long-term treatment presented in the SDEIS, ranging from $3.5 to 6 million appears to be an estimate for monitoring activities only,[15] *without any long-term wastewater treatment costs*. But at another mine site on the same property, the estimate of *annual* operation and maintenance costs for the same type of wastewater treatment as the Project proposes to use (reverse osmosis/nano-filtration) was $2.6 million.[16] Perpetual operation and maintenance of mechanical wastewater treatment is an additional cost that must be represented in the estimate of financial assurance. The cursory estimate of financial assurance in the SDEIS provides little detail about how the dollar amount was derived. Instead, discussions have been postponed for the permitting phase of this Project. This approach fundamentally contradicts federal and state environmental policy and the SDEIS must be revised, with significant additional study, to appropriately evaluate closure, mitigation, reclamation, and perpetual treatment cost estimates.

B. Alternatives.

Mining need not be synonymous with pollution: "In the right place – and with conscientious companies, new technologies and good planning –many of the potential impacts

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[12] SDEIS at 4-11.
[13] *See* 40 C.F.R. § 320.
[14] *See* MNDNR, USACE, USFS, "Underground Mining Alternative Assessment for the NorthMet Mining Project and Land Exchange Environmental Impact Statement" (Sept. 27, 2013), SDEIS at App'x B.
[15] SDEIS at Table 3.2-15 (citing Foth Infrastructure & Environment, LLC, Memo to PolyMet Mining Inc. (Mar. 11, 2013)).
[16] Barr Engineering, Area Pit 1 Evaluation in Support of Non-Degradation Analysis, Mesabi Nugget Phase II (Nov. 30, 2009). http://yosemite.epa.gov/oa/eab_web_docket.nsf/Filings%20By%20Appeal%20Number/DFFE5787106C216685257B0400620E82/$File/Bands%20Exhibits%2012-14%20...3.07.pdf (last visited Mar. 11, 2014)

are avoidable. In fact, most mine pollution arises from negligence, not necessity."[17] The NEPA "hard look" requires agencies to "exercise a degree of skepticism in dealing with self-serving statements from the prime beneficiary of a project"[18] when analyzing alternatives.

The SDEIS does not evaluate or examine Project alternatives in any substantive way; even the no-action alternative is lacking in detail and analysis.[19] Instead, the SDEIS states:

> 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, Appendix B of 33 CFR Part 325 supersedes the CEQ requirement to identify an agency-preferred alternative.[20]

Part 57(4) of 33 C.F.R. Part 325 at Appendix B, NEPA Implementation, only states:

> Alternatives. See 40 CFR 1502.14. The Corps is neither an opponent nor a proponent of the applicant's proposal; therefore, the applicant's final proposal will be identified as the "applicant's preferred alternative" in the final EIS. Decision options available to the district engineer, which embrace all of the applicant's alternatives, are issue the permit, issue with modifications or conditions or deny the permit.

To the extent this limits USACE's obligation to identify an agency-preferred alternative, which is not clear, nothing there limits the *USFS's* obligation to do so. Moreover, Part 57(4) of Appendix B does require that "reasonable alternatives" must be considered in detail, along with "geographic alternatives, e.g., changes in location and other site specific variables, and functional alternatives, e.g., project substitutes and design modifications."

The Band has long cited this defect in its comments,[21] and EPA cited the lack of alternatives as a factor when issuing an EU-3 rating for the DEIS. Although the SDEIS was revised to reflect the Project proponents' preferred action, still, the only alternative analyzed in

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[17] Safe Drinking Water Foundation, Mining and Water Pollution, (http://www.safewater.org/PDFS/resourcesknowthefacts/Mining+and+Water+Pollution.pdf (last visited Mar. 1, 2014).
[18] *Simmons v. United States Army Corps of Engineers*, 120 F.3d 664 (7th Cir. 1997).
[19] 40 C.F.R. § 1502.14 (stating also that the EIS must "[d]evote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits."); 40 C.F.R. § 1502.16 (requiring the EIS to include analysis of "[t]he environmental effects of alternatives including the proposed action.")
[20] SDEIS, Comparison of Alternatives at 7-12.
[21] *See, e.g.*, Band's Cmts. on DEIS at 5-6.

any detail concerns the acreage of the proposed land exchange. This failure is a serious violation of NEPA and must be remedied before the SDEIS can be finalized.

1. No discussion of LEDPA.

No effort was made to discuss or evaluate the least environmentally damaging practicable alternative ("LEDPA") required before rendering a Clean Water Act Section 404 wetlands permit. The enacting regulations of Section 404 of the Clean Water Act specify that "no discharge of dredge or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences."[22] CEQ guidance clarifies that "[r]easonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant."[23]

2. Other typical mitigation and prevention measures not considered.

The SDEIS failed to substantively consider many alternatives that may provide mitigation for, or prevent long-term environmental damage. Some of these alternatives include: paste tailings to reduce the project footprint and use less water thus decreasing risk of water pollution; perpetual pumping of the mine pit to prevent a pit lake from forming and by doing so protecting groundwater; back-filling waste rock into the east, central, and west mine pits to reduce the mine foot print and restore wetlands; engineered liners; providing reverse osmosis treatment at the mine site beginning in year one of operations to augment water loss in nearby high quality wetlands in the Partridge River watershed; and underground mining.

a. Paste tailings.

Part of the proponents' preferred alternative analysis presented in the SDEIS is to deposit new and more reactive tailings on top of existing tailings in an unlined basin that is currently under a Consent Decree requiring clean-up of seepage that has already polluted the nearby ground and surface waters.[24] Furthermore, the tailings basin seepage capture rate of 90 percent assumed in the preferred alternative has not been demonstrated anywhere in the U.S.[25] and is simply not possible because the tailings basin was built without a liner. In fact, at the Project site, the existing seepage capture system that was installed as a requirement of the Cliffs Erie Consent

[22] 40 CFR § 230.10(a).
[23] CEQ, Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act, (Mar. 1981), available on-line at http://energy.gov/sites/prod/files/G-CEQ-40Questions.pdf (last visited Mar. 10, 2014).
[24] Barr Engineering, Long-term Mitigation Evaluation and Implementation Plan for SD026, Prepared for Cliffs Erie and PolyMet (April 2012), attached at Ex. A.
[25] EPA, Evaluation of Subsurface Engineered Barriers at Waste Sites (Aug. 1998), available on-line at http://www.epa.gov/tio/download/remed/subsurf.pdf (last visited Mar. 10, 2014).

Decree for SD026 is so ineffective that Cliffs Erie is proposing to build an additional dam and capture system further downstream.[26] Therefore, paste tailings placed on a liner and covered could have a profound, minimizing effect on pollution reaching the Embarrass River watershed wetlands and the Embarrass River. The SDEIS does not even mention this modern technique used by many mines in U.S. and around the world,[27] without justification:

> Converting to paste tailings technology from conventional slurry tailings at most mines makes sense both environmentally and economically. Paste tailings use less water; require less land; do not require engineered containment dams; generate less acid and contaminants; reduce long-term costs and allow for early reclamation. Slurry tailings use and discharge large volumes of water, require dust control measures, require large land areas and containment dams for disposal, and create contaminated water that must be captured and treated.[28]

b. Perpetual pumping.

Perpetual pumping of the mine pits to prevent formation of a pit lake is required by the State of New Mexico, Office of Natural Resource Trustee, for the Chino and Tyrone copper mines expressly to protect groundwater and waterfowl.[29] Numerous western mines have discharged plumes of polluted water into the bedrock aquifer from leaking mine pits, tailings basins and waste rock piles, a problem that is not only difficult but expensive to fix.[30] Requiring perpetual pump out of the mine pit would minimize leakage of contaminated water into the surrounding bedrock aquifer thereby protecting groundwater that the State is required to protect as source of drinking water.

c. Backfilling.

The SDEIS summarily dismissed the possibility of backfilling:

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[26] Letter of Cliffs to John Thomas, MPCA, copying Kevin Pylka, PolyMet Mining, Inc., Compliance and Enforcement regarding planned improvements to SD026 pump-back system, (May 7, 2013), attached at Ex. B.
[27] Mining Engineering, November 2011, Vol. 63, No. 11, available at http://www.knightpiesold.com/en/assets/File/NovemberOptimized11article.pdf, (last visited Mar. 1, 2014).
[28] Kuipers& Associates, Converting to Paste Tailings at the Chevron Mining, Inc. Molybdenum Mine, Questa, New Mexico (Sept. 2012), available at http://r3group.org/uploads/documents/49.pdf (last visited Mar. 10, 2014).
[29] New Mexico Office of Natural Resources Trustee, Final Groundwater Restoration Plan for the Chino, Cobre, and Tyrone Mine Facilities (Jan. 4, 2012), available at http://www.nmenv.state.nm.us/wqcc/documents/NMAGExh11.pdf (last visited Mar. 10, 2014).
[30] Environmental Law Alliance Worldwide, Guidebook to Evaluating Mining Project EIAs (2010), at https://www.elaw.org/mining-eia-guidebook (last visited Mar, 4, 2014).

> The opportunity to reclaim wetlands and vegetation at the Category 1 Stockpile footprint area would be the only measurable environmental benefit offered by backfilling the Category 1 Stockpile into the West Pit. However, because of the temporal effect that the stockpile would have, those effects would be required to be mitigated regardless of future backfilling or not. Furthermore, the potential environmental benefit is moot or outweighed because encumbrance is not allowed in PolyMet's private mineral leases and because the costs associated with backfilling, additional water treatment (rates), and encumbrance compensation determined in revised lease agreements may affect the ability of PolyMet to secure financing (MDNR et al. 2013b). As such, the option to backfill the West Pit was eliminated from further consideration in the SDEIS.[31]

But back-filling all of the mine pits with waste rock would reduce the surface footprint of the mine and make possible 526 acres of wetland restoration where the Category 1 stockpile is now proposed to be stored without a liner in perpetuity. This alternative would prevent the need for a separate seepage capture system around an unlined waste rock pile, as proposed in the preferred alternative, that would have to work at an above optimum capture rate in perpetuity. Capping and re-vegetating the mine pits after backfilling with waste rock would prevent deep infiltration of precipitation. In combination, perpetual pumping and backfilling the Category 1 waste rock pile would substantially reduce the risk of polluting groundwater and wetlands in the Partridge River watershed.

d. Engineered liners.

Engineered liners for the Category 1 Waste rock Stockpile and the Overburden Storage Layout Area ("OSLA") would ensure that seepage would not migrate into fractures below the storage facilities and increase the effectiveness of seepage capture. The OSLA will contain peat that has sequestered mercury. When water flows through the OSLA the seepage will transport some of the mercury from the peat. By lining the OSLA, less mercury will escape into the environment. If the Category 1 Stockpile were lined, seepage capture efficiency would increase and less water carrying pollution would migrate from the pile into the fractures below the storage area thereby protecting groundwater.

The Band reiterates that the CEQ rules require that the EIS "present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public."[32] The SDEIS must be revised to evaluate reasonable alternatives in the SDEIS including the *federal agency* preferred alternative and the LEDPA.

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[31] SDEIS at 3-152.

[32] 40 C.F.R. § 1502.14 (stating also that the EIS must "[d]evote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.").*See also* 40 C.F.R. § 1502.16 (requiring the EIS to include analysis of "[t]he environmental effects of alternatives including the proposed action.")

e. Reverse osmosis treatment.

PolyMet proposes to build a reverse osmosis ("RO") wastewater treatment plant near the tailings basin to treat process water and tailings basin seepage. RO is very effective if sized correctly. While RO could successfully treat wastewater to comply with Minnesota WQS, it can only treat polluted water that has been collected. Therefore, the Project is not relying on RO during operations to comply with WQS; instead, it would rely on seepage capture efficiency. But as stated previously, seepage capture rates provided in the SDEIS are not realistic.

After operations, the SDEIS contemplates that the RO plant would continue to treat tailings basin seepage and begin treating tailings pond water. The treated water would be used for augmentation of streams near the plant site. Colby Lake water is also proposed for stream augmentation. However, because Colby Lake water exceeds WQS for many pollutants including mercury, it would also need to be RO-treated before being used for augmentation.

> Mechanical water treatment is part of the modeled NorthMet Project Proposed Action for the duration of the simulations (200 years at the Mine Site, and 500 years at the Plant Site). The duration of the simulations was determined based on capturing the highest predicted concentrations of the modeled NorthMet Project Proposed Action.[33]

As the Project is currently proposed, after operations, the mine site wastewater treatment plant will be converted to RO to treat the west mine pit lake and Category 1 stockpile seepage for discharge to the west pit outlet creek that flows into the Partridge River.[34] An alternative that was not considered in the SDEIS would use RO at the plant site to begin with to treat storm water, mine infiltration, and waste rock pile seepage. Using RO treated water for stream and wetland water augmentation in the Partridge River watershed would provide mitigation for the some of the adverse effects of mine pit dewatering.

In order to ensure compliance with Minnesota WQS, and based on the Projects own modeling, adequate financial assurance must be set aside to maintain and operate perpetual RO treatment at both the mine and plant sites.

Furthermore, RO-treated water should be used to augment stream flow at both the plant site and mine site. Colby Lake water should not be used for stream augmentation unless it is RO-treated first. RO will not cause waters in the vicinity of the plant site to comply with WQS due to low seepage capture efficiency at the tailings basin. Therefore, other alternatives for tailings storage must be considered. While the use of RO is encouraged, further analysis and application is needed.

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[33] SDEIS, p. 5-7
[34] SDEIS, p. 5-6

f. Underground mining.

The MNDNR and USACE considered underground mining as an alternative to the proposed open pit(s) for the DEIS in 2009, but eliminated it because it would have had "a significantly reduced rate of operation that would not be considered economically feasible, and, therefore, would not meet the Purpose and Need of the Project."[35] Even though underground mining was reconsidered for the SDEIS, the Co-Lead Agencies did not "exercise a degree of skepticism in dealing with self-serving statements from the prime beneficiary of a project"[36] when analyzing alternatives. The Project proponent eliminated the alternative based solely on an economic decision that underground mining would not be as profitable as open pit mining. The co-leads state that "it was not possible to undertake a quantitative, side-by-side assessment of the underground mining alternative."[37]An underground mine would have a reduced mining rate and life of mine, employed fewer workers for a shorter period of time, and reduced state and local tax revenues. Conversely, although the underground mining alternative would offer environmental benefits, the SDEIS includes no economic analysis of those benefits. Still, the Co-Lead Agencies determined that underground mining would result in reduced socioeconomic benefits, and "PolyMet would not move forward with an unprofitable project, thus any potential environmental or socioeconomic benefits associated with this alternative are moot."[38]

Although underground mining was considered technically feasible, the Co-Leads provided that:

> PolyMet is a private sector and for-profit company, the value of the saleable material would need to provide sufficient income to cover operating cost (which includes, but is not limited to, the cost of mining, processing, transportation, and waste management), capital cost (to build and sustain facilities), *an adequate return to investors*, reclamation, and closure costs and taxes. Using underground mining would result in most of the NorthMet Deposit left unmined because of its low metal value (i.e., less value than the cost of mining and mineral processing). Other material would have to be left in place for safety reasons, to prevent collapse.[39]

Therefore:

> …the Co-lead Agencies found that while underground mining is technically feasible, available, and would offer significant environmental benefits over the

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[35] *See* SDEIS at App'x B (MNDNR, USACE, USFS, Underground Mining Alternative Assessment for the NorthMet Mining Project and Land Exchange Environmental Impact Statement (Sept. 27, 2013)).
[36] *Simmons v. United States Army Corps of Engineers*, 120 F.3d 664 (7th Cir. 1997).
[37] *See* SDEIS at App'x B.
[38] *Id.*
[39] *Id.* (emphasis added).

> proposed NorthMet Project, it would not be economically feasible and would not meet the Purpose and Need. Since the underground mining alternative would not meet all of the screening criteria, it is not considered to be a reasonable alternative. Therefore, the underground mining alternative was eliminated from further evaluation in the SDEIS.[40]

In no way does this constitute an appropriate level of detail. The conclusion that underground mining is not viable, or preferable, remains substantially unjustified, despite repeated requests for further analysis.[41] Without considering the economics of perpetual treatment the economic analysis provided by the Project proponent concludes that underground mining is "[n]ot economically viable," while simultaneously claiming that backfilling the west pit would create encumbrances not allowed in their lease due to minerals located below the west pit that can only be accessed through underground mining. This is not the appropriate use of a cost-benefit analysis for purposes of analyzing an EIS alternative. The CEQ regulations require that, where a cost-benefit analysis is "relevant to the choice among environmentally different alternatives," there are a variety of additional requirements, including "analysis of un-quantified environmental impacts, values, and amenities,"[42] in addition to other CEQ alternatives rules.

As the Band already argued in the Tribal Position, significant additional study of the underground mining alternative is mandated, and the SDEIS offers no new discussion of the reasons for rejecting the alternative. The economic viability of an underground mine depends on a variety of factors including ore grade, market prices, cost of tailings, and waste rock disposal. A study of this particular deposit was performed by the prior owner of the site, U.S. Steel, which actually *recommended* underground mining.[43] PolyMet is well aware of this study, given that the company included it in a 2003 filing with the Securities and Exchange Commission.[44] In fact, by examining cross-sections showing the distribution of ore by depth,[45] it appears that there are substantial ore reserves at depths that likely could not be accessed by the proposed open-pit mine. The ecological costs of open-pit mining and above-ground disposal of tailings and waste rock are immense. This ecological cost, combined with the most current understanding of deposit ore grades and reasonably possible metals prices, and the costs associated with perpetual treatment must be evaluated to determine the viability of this alternative.

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[40] *Id.*
[41] Band's Cmts. on June 2008 PDEIS at 5, Ex. A; *see also* Band's Cmts. on Jan. 2009 PDEIS at 8, Ex. B.
[42] 40 C.F.R. § 1502.23.
[43] *See, e.g.*, S.E.C. Form 20-F, PolyMet, Inc. Annual Report for Yr. ending 1/31/03, ITEM 4.D(d) (stating "[a] 1971 study for US Steel suggested mineralized deposits to a depth of 2000 feet and recommended underground mining techniques for recovery."), available on-line at http://www.sec.gov/Archives/edgar/data/866028/000086602803000003/pmf2003.txt (last visited Mar. 10, 2014).
[44] *Id.*
[45] *See* PolyMet Tech. Doc. GC06.

C. Proposed land exchange.

In 2000, the Government Accountability Office ("GAO") issued a critical report assessing how the Bureau of Land Management and the USFS land exchange program requirements had been implemented between 1989 and 1999 identifying several significant problems. The report states that:

> …agencies did not ensure that the land was being appropriately valued, or that exchanges served the public interest, or met certain other exchange requirements. In view of the many problems in both agencies' land exchange programs and given the fundamental difficulties that underlie land exchanges when compared with cash-based transactions, we believe that the Congress may wish to consider directing the Service and the Bureau to discontinue their land exchange programs.[46]

Again, in a 2009 review, the GAO found substantial problems implementing land exchanges. One-third of the 31 land exchanges examined had documented issues in the agency's public interest determination.[47] 36 C.F.R. Section 254.3(a) provides "[t]he Secretary is not required to exchange any Federal lands." But while there is no requirement to exchange federal land, voluntary real estate transactions are required to follow federal regulations including the public interest determination.[48] However, the SDEIS does not disclose appraisal information and only superficially discusses public interest.

The federal lands proposed for exchange contain portions of the Minnesota County Biological Survey ("MCBS") Headwater Site:[49]

> The Headwaters Site straddles the continental divide, with water from the Site flowing both east through the Great Lakes to the Atlantic Ocean and north to the Arctic Ocean. Paradoxically, the divide runs through a peatland. Although the peatland appears flat, water flows out of it from all sides, forming the ultimate source of rivers that eventually reach two different oceans. The Site is the headwaters of four rivers: Stony River, Dunka River, South Branch Partridge River, and the St. Louis River, which is the second largest tributary to Lake Superior….[t]hese conservation areas are the best opportunities for conserving the

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[46] GAO, BLM and the Forest Service: Land Exchange Need to Reflect Appropriate Value and Serve the Public Interest (June 2000), at http://www.gao.gov/archive/2000/rc00073.pdf (last visited Mar. 4, 2014).
[47] GAO, BLM and the Forest Service Have Improved Oversight of the Land Exchange Process, but Additional Actions are Needed (June 2009), at http://www.gao.gov/assets/300/290765.pdf (last visited Mar. 4, 2014).
[48] 36 C.F.R. § 254.3(b).
[49] SDEIS at ES-31, 4-429.

full diversity of terrestrial and aquatic ecosystems and globally rare or declining species.[50]

Of the approximately 6,025 acres of MCBS Sites of High Biodiversity Significance under the Land Exchange Proposed Action,[51] nearly 2,000 acres of coniferous bog wetlands will be lost to the federal estate, and therefore effectively lost to the Bands, if the proposed land exchange takes place. This is significant because many tribally harvested resources are only available in coniferous bogs (e.g. cranberries, labrador tea, creeping snowberry), and restoration of coniferous bogs is a very difficult and long process that has extremely low success rates.[52]

Exchanging thousands of acres of diverse, high-quality land--land with some of the few remaining large game corridors in northeastern Minnesota that are available to the Bands to exercise reserved 1854 Treaty rights--for lands that have moderate diversity and lack big-game corridors is inconsistent with the fiduciary responsibilities that are shared by all federal agencies. The SDEIS attempts to diminish the significance of the loss of these high-quality lands by stating that "[g]iven the existing lack of overland public access and actual use of the federal lands, as well as historic use of this area for mineral exploration (see Section 4.2.9), the Land Exchange Proposed Action represents little to no change in the actual level of recent or current use of the federal lands." In fact, historic trails key to both the exercise of treaty rights and of historic significance connect what is now Beaver Bay with Lake Vermillion. These trails "are associated with the lives of persons significant in our past"[53]including John Beargrease,[54] Peter Gagnon,[55] and Alec Posey.[56] In more recent history, Bois Forte Band members used a sugarbush near the plant site and harvested wild rice in the Embarrass River near the LTVSMC tailings basin.[57]

Additionally, the SDEIS does not provide adequate discussion of the adverse effects of the proposed land exchange on wetlands and headwater streams within the St. Louis River watershed and the Lake Superior Basin. The loss of first-order headwaters streams, second-order streams, and wetlands in the Basin have the potential to significantly adversely impact downstream water quality, fisheries, and wildlife that are important to the Bands. The proposed

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[50] Minnesota Biological Survey Division of Ecological Services Department of Natural Resources, An Evaluation of the Ecological Significance of the Headwaters Site, March 2007.
[51] *See* SDEIS at Table 5.3.4-1.
[52] Quinty, F., Rochefort, L., Peatland Restoration Guide (2nd ed. 2003), available at http://www.gret-perg.ulaval.ca/uploads/tx_centrerecherche/Restoration-Guide_2nd_2003.pdf (last visited Mar. 10, 2014).
[53] 30 C.F.R. Part 60.4(b).
[54] Lancaster, D., *John Beargrease: Legend of Minnesota's North Shore* (Holy Cow Press: 2008)/
[55] Bardon, John A., Superior Wisconsin Papers 1831-1942, at http://digital.library.wisc.edu/1711.dl/WI.Hayes1j (last visited Mar. 10, 2014).
[56] Vennum, Thomas Jr., *Wild Rice and the Ojibway People* (Minnesota Historical Society Press: 1988).
[57] Rose Berens, Bois Forte Tribal Historic Preservation Officer, 2010; Berens and Raske, THPO. Personal Communication. NorthMet Project Historic Properties Consultation (Apr. 29, 2013).

action land exchange would trade water resources within the Lake Superior Basin for wetlands and surface water outside the Lake Superior Basin and the St. Louis River watershed, although still within the 1854 Ceded Territory. Federal lands now provide 4,164 acres of wetlands within the Lake Superior Basin. Non-federal lands contain 4,669 acres of wetlands, of which 373 acres are within the Lake Superior Basin, demonstrating there would be a loss of 3,791 acres of federally-managed wetlands within the Lake Superior Basin under the proposed exchange.[58]

It is well known that wetlands play an important role in the condition of downstream waters by retaining floodwaters, sediment, nutrients, and other pollutants, thereby benefitting the quality of downstream waters. Wetlands may also function as thermal refuge for moose when summertime temperatures exceed 14^{o} C, the point at which moose become thermally stressed.[59] Additionally, wetlands with aquatic vegetation provide an important forage resource for moose during the open-water season.

Furthermore, the SDEIS acknowledges that the Land Exchange Proposed Action would create a "net increase of third-order streams and decrease in first- and second-order streams which would likely add more habitat diversity to the Superior National Forest."[60] But the SDEIS underestimates the impact of this increase: "Headwater streams are the smallest parts of river and stream networks, but make up the majority of river miles in the United States. Many headwater streams have been lost or altered due to human activities … and this can impact species and water quality downstream."[61]

The SDEIS states that the decrease of first-order streams to the federal estate would "slightly reduce the amount of available spawning habitat for some aquatic species as headwater streams provide specialized spawning habitat for some species."[62]Again, this underestimates the impacts. While greater diversity is desirable, protection of headwater streams is critical because they powerfully influence both the character and functions of downstream waters. Headwater streams transport vegetation, woody debris, organic matter, macroinvertebrates, and other organisms downstream, while providing spawning areas for brook trout. Headwaters provide most of the water to rivers, which in turn provides temperature mitigation and oxygenation which are necessary for healthy fish communities.

Furthermore, the Superior National Forest Plan explicitly incorporates tribal treaty obligations, and these should remain a fundamental part of any land planning:

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[58] SDEIS at Table 5.3.3-4, 5-598.
[59] Karns, P. D., *Ecology and Management of the North American Moose* (Univ. Press of Colo.: 1997).
[60] SDEIS at 5-653.
[61] EPA, Research in Action: Headwater Stream Studies, at http://www.epa.gov/eerd/research/headwater.html (last visited Mar. 5, 2014).
[62] SDEIS at 5-643.

> Lands within the Forest serve to help sustain American Indians' way of life, cultural integrity, social cohesion, and economic well-being. Superior National Forest facilitates the exercise of the right to hunt, fish and gather as retained by Ojibwe whose homelands were subject to treaty in 1854 and 1866 (10 Stat. 1109 and 14 Stat. 765). Ongoing opportunities for such use and constraints necessary for resource protection are determined in consultation with the following Ojibwe Bands: Fond du Lac, Grand Portage, and Bois Forte. Forest management activities will be conducted in a manner to minimize impacts to the ability of Tribal members to hunt, fish, and gather plants and animals on Forest Service administered lands.[63]

The SDEIS actually concedes that the land exchange will cause irretrievable losses of resources for the Bands: "The federal lands may contain natural resources culturally important to tribal entities, including access to the land itself, which would be irreversibly lost following the Land Exchange Proposed Action and conversion of the land from public to private ownership."[64] Further, the SDEIS provides that the land exchange proposal could have direct and indirect effects on tribal cultural resources by creating noise, impeding access to area that are traditionally or culturally important to the bands and affecting species of importance to the Bands.

The SDEIS also erroneously concludes that no known cultural resources exist on the non-federal lands, despite impacts to wild rice waters, and the proposed exchange will not sufficiently compensate for the loss:[65]

> The Land Exchange Proposed Action would result in additional wild rice beds by the acquisition of Tract 1. Tract 1 contains Little Rice Lake, which supports a continuous population of wild rice. Wild rice also grows along the Pike River south of Little Rice Lake and in isolated populations on Hay Lake.[66]

The wild rice waters in Tract 1 are accessible to the Bands via the Pike River. Therefore, adding Tract 1 to the federal estate does not provide additional wild rice harvesting opportunities to Band members in the 1854 Ceded Territory, even though it would add an additional 126 acres of wild rice beds to the federal estate.

The desire to resolve "conflict" between the USFS and Project proponent should not overshadow federal fiduciary responsibility to the Bands. The proponent wishes to develop an open pit mine but cannot due to deed restrictions on the federal estate because the surface estate was purchased by the USFS under the authority of the Weeks Act. More roads and hiking trails

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[63] USFS, Superior National Forest Plan at 2-37 and 2-38.
[64] SDEIS at 7-10.
[65] *Id.* at 5-661, 5-674.
[66] *Id.* at 5-609.

may provide more access to the public, but do nothing to promote habitat diversity and long-term ecosystem sustainability that are requirements for the preservation of tribal usufructuary rights. Although the land exchange proposed action may increase acreage in the federal estate, the loss of critical wildlife corridors, along with high quality and diverse land and water resources, directly connects the federal regulatory agencies' trust responsibilities to the Bands. The land exchange, and the Project, cannot proceed where they require the agencies to approve permits that will have impacts to treaty resources without additional evaluation and mitigation.[67]

D. Water quality and quantity estimates based on flawed science.

It is commonly acknowledged that "[w]ater has been called 'mining's most common casualty'.... Mining affects fresh water through heavy use of water in processing ore, and through water pollution from discharged mine effluent and seepage from tailings and waste rock impoundments."[68]Acid mine drainage ("AMD") is one of the greatest environmental liabilities associated with mining, especially in pristine environments like the Project mine site, that have economically and ecologically valuable natural resources.[69] There are no hardrock surface mines that exist today that can demonstrate that AMD can be stopped once it occurs on a large scale.[70] Inaccurate pre-mining characterization and interpretation often results in a failure to recognize or predict impacts to water quality and aquatic life.[71] Evidence from literature and field observations suggests that permitting large scale surface mining in sulfide-hosted rock with the expectation that no degradation of surface water will result due to acid generation imparts a substantial and unquantifiable risk to water quality and fisheries.[72]

In a report comparing predicted and actual water quality at hardrock mines, there were two types of characterization failures that were key to explaining differences between the predicted water quality in EIS documents and the actual water quality either during or after mining began.[73] These included:

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[67] *See*, *e.g.*, Exec. Order 13175—Consultation and Coordination With Indian Tribal Governments.
[68] Safe Drinking Water Foundation, Mining and Water Pollution, at http://www.safewater.org/PDFS/resourcesknowthefacts/Mining+and+Water+Pollution.pdf (last visited Mar. 1, 2014).
[69] Band's Cmts. on DEIS at Ex. G (Reclamation Research Group (Bozeman, MT) for USFWS Anchorage, Alaska, "Acid Mine Drainage and Effects on Fish Health and Ecology: A Review" (2004)).
[70] Earthworks Factsheet, "Hardrock Mining: Acid Mine Drainage," available on-line at http://www.earthworksaction.org/files/publications/FS_AMD.pdf ((last visited Mar. 10, 2014).
[71] Band's Cmts. on DEIS at Ex. G ("Acid Mine Drainage…" (2004)).
[72] *Id.*
[73] Kuipers& Assocs., "Comparison of Predicted and Actual Water Quality at Hardrock Mines" (2006), http://www.earthworksaction.org/library/detail/comparison_of_predicted_and_actual_water_quality_at_hardrock_mines/#.Ux-_2D9dWNY (last visited Mar. 11, 2014)

(1) Insufficient or inaccurate characterization of the hydrology: The authors reported primary causes of hydrologic characterization failures as overestimations of dilution, lack of hydrological characterization, overestimations of discharge volumes, and underestimations of storm size.[74]

(2) Insufficient or inaccurate geochemical characterization of the proposed mine:[75] The primary causes of geochemical characterization failures were identified as lack of adequate geochemical characterization, in terms of sample representativeness and sample adequacy.[76]

The primary causes of mitigation failures were that mitigation measures were not identified, were inadequate, or were not implemented; waste rock mixing and segregation was not effective; liners leaked; tailings were spilled; or embankments failed, and land application discharge was not effective.[77]

The SDEIS suffers from all of these characterization failures. An egregious *lack of hydrologic characterization* allows PolyMet to pretend that there will be no water pollution resulting from the Project. In fact, the SDEIS arbitrarily concludes water quality will actually *improve* as a result of the Project.[78] The following is a short list of the problems with water modeling in the SDEIS.

1. Selective use of monitoring well data.

The Project proponent provides that "three monitoring wells were installed in 2005 and sampled quarterly or less frequently prior to 2011; an additional 21 wells were installed between October 2011 and February 2012 and were sampled monthly through August 2012. All 24 wells are currently sampled three times per year (quarterly, excluding winter (1st) quarter)."[79] But no bedrock monitoring wells were installed near the tailings basin. Only nine bedrock wells were installed for the entire Project, all in the area where the proposed mine pit(s) would be located.[80] Moreover, data collected specifically for the Project was selectively used, with several well and surface water monitoring stations' data completely excluded from the water quality models used to predict Project impacts.[81] Specifically, all data collected from groundwater monitoring wells

[74] *Id.* at ES-14.
[75] *Id.* at ES-13
[76] *Id.*
[77] *Id*.
[78] SDEIS at 5-131, 5-148, 5-168.
[79] *Id.*
[80] *See* Barr Engineering, On-going Data Collection for the NorthMet Water Quality Modeling, (Feb. 2013), at Large Figure 1, Groundwater Monitoring Locations at the Mine Site, in SDEIS Electronic References, Barr 2013b, Disc 1 of 2.
[81] *Id.*

GW008 (13 sampling events), GW009 (12 sampling events), and GW010 (9 sampling events), were excluded from the models.[82] These monitoring wells are northeast and north of the tailings basin between the tailings basin and the Embarrass River.[83]

Furthermore, none of the nine surface water quality sampling events collected at PM 11, a sampling station on unnamed creek located northwest of the tailings basin half-way between the tailings basin and the Embarrass River, were used in the Projects models. Also excluded from the models were data from nine sampling events collected at Station PM 12.1 in the Embarrass River upstream of the tailings basins.[84]

Instead, the model includes 53 sampling events in the Embarrass River at PM-13.[85] PM-13 is 7.3 river miles downstream of the northwest corner of the tailings basin, and 16.2 river miles from monitoring location PM-12.2 - long past the first water quality compliance points in the Embarrass River.

An additional problem is that the models intended to predict impacts from the Project were not calibrated to existing water quality in Colby Lake. Most of the data used to represent Colby Lake in the model was extrapolated from sampling sites well upstream in the Partridge River.

Despite this selective use of water modeling data, the SDEIS claims "[t]he NorthMet Project Proposed Action is also not predicted to result in any significant changes to groundwater and surface water flows when compared to existing conditions."[86] To achieve this prediction, the hydrologic models for the Project were built using modeled inputs rather than actual measurements or estimates from scientific literature. This makes the Project models unable to accurately characterize groundwater flow direction, water tables, potentiometric surface in the aquifers, fluxes to rivers and streams drawdown mounding impacts to the water tables or surface waters, or to predict water quality impacts. The models for the Project must be re-calibrated using all available measured data and scientifically credible basic model inputs.

2. Incorrect baseflow rate prediction.

Baseflow is the component of streamflow attributed to groundwater discharge from both deep subsurface and delayed shallow subsurface flow. It is established by measuring the rate of stream flow during low flow conditions; either in the winter months when groundwater continues flowing under the frozen surface, or in warmer months during periods of time when there is no precipitation. Baseflow is used to define the amount of groundwater contribution to streamflow,

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[82] *Id.*
[83] *Id.* at Large Figure 2, Groundwater Monitoring Locations at the Plant Site.
[84] *Id.* at Large Table Figure 4, Surface Water Monitoring Location in the Embarrass River Watershed.
[85] *Id.*
[86] SDEIS at 5-8.

and helps determine the speed at which groundwater travels. The baseflow rate predicted by XP-SWMM is three times lower than flow data indicates, and implies recharge to the groundwater system from precipitation that is not consistent with published literature.[87]

3. Outdated baseflow data.

Chapter 5 of the SDEIS acknowledges that "[t]he NorthMet Project Proposed Action would have the potential to affect groundwater and surface water hydrology and quality in both the Partridge River and Embarrass River watersheds."[88] However, the hydrology model that *was* developed to determine Project impacts relied on outdated data collected too far from the site.[89] Because the Project proponent was not required to install stream gauges at the site, they used a model (XP-SWMM) to extrapolate baseflow far upstream from where the data was collected to the areas where the proposed mine pit(s) and tailings basin would be located. The extrapolated baseflow used twenty-year-old stream gauging data collected seventeen miles downstream of the mine site in the Partridge River,[90] and stream gauging data that is more than fifty years old collected eleven miles downstream of the plant site in the Embarrass River.[91] In fact, the data used to model impacts in the Embarrass River (1942 – 1964) watershed *precedes* the LTVSMC mining operations at the site. Therefore, the results are highly unlikely to be representative of current conditions at the mine or plant site.

4. Contradictory baseflow data.

During subzero temperatures January 25-26 and February 15-16, 2011, the minimum baseflow measured by the MNDNR in the Partridge River at the point nearest the proposed mine pits was of 3.4 cubic feet per second (cfs). Values calculated by staff from Great Lakes Indian Fish and Wildlife Commission ("GLIFWC") and MNDNR from low flow stream gauge data in the Partridge River ranged from 1.2 to 1.8 cfs, while the XP-SWMM model predicted a baseflow of 0.5 cfs. Not only is the Project modeled baseflow inconsistent with published literature, none of the measured data supports the baseflow predicted by XP-SWMM at SW003 of 0.5 cfs. XP-SWMM's extrapolation of unrealistically low baseflows was used to calibrate the MODFLOW model and therefore influences virtually all aspects of the Project water quality and quantity characterization and impact prediction, including: groundwater flow rates and pit inflow, dewatering impacts to the rivers and wetlands, water treatment needs, contaminant transport times and concentrations, and contaminant dilution. Higher baseflows in the Partridge River indicate that the wetlands and river are connected to the groundwater aquifer, that mine pit

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[87] USGS, Delin, G., et al., Comparison of Local- to Regional-Scale Estimates of Groundwater Recharge in Minnesota, Journal of Hydrology, Vol. 334, Issues 1-2 (Feb. 20 2007) at 231–249.
[88] SDEIS at 5-5.
[89] Barr Engineering, Water Modeling Data Package Vol.1-Mine Site v.12 and Vol. 2 Plant Site v.9 (Mar. 2013).
[90] *Id.*
[91] *Id.*

inflow will be greater; and that groundwater will travel through the aquifer will occur at a much faster rate.

During subzero temperatures January 25-26 and February 15-16, 2011, the minimum baseflow measured by the MNDNR four miles south of the LTVSMC tailings basin 13.9 to 15 cfs in the Embarrass River. Model estimated the average annual baseflow for the Embarrass River, based on data more than 50 years old, at 8.7 cfs.

5. Dangerous underestimation of groundwater travel time.

It is widely acknowledged that "[m]ining can deplete surface and groundwater supplies. Groundwater withdrawals may damage or destroy streamside habitat many miles from the actual mine site."[92] The importance of accurate evaluation of geology cannot be underestimated in modeling:

> Hydrogeologic characterization studies should include geological descriptions of the site, including descriptions of rock types, intensity and depth of weathering, and the abundance and orientation of faults, fractures, and joints. Although difficult to evaluate, the hydrologic effects of fractures, joints, and faults are especially important to distinguish and characterize. Water moves more easily through faults, fractures, and dissolution zones, collectively termed secondary permeability, than through rock matrices. Secondary permeability can present significant problems for a mining facility because it can result in a greater amount of groundwater discharge to a mine than originally predicted.[93]

However, the SDEIS indicates that mine pit dewatering impacts will be very limited or non-existent based on the assumption that there is little or no connection between the bedrock and surficial aquifers.[94] This assumption *is not supported by the data* used to characterize mine site hydrology; instead, it is based on an unsupported "professional opinion."[95] The SDEIS goes on to say:"[t]he bedrock is highly competent with very low hydraulic conductivities, very little

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[92] Safe Drinking Water Foundation, Mining and Water Pollution, http://www.safewater.org/PDFS/resourcesknowthefacts/Mining+and+Water+Pollution.pdf (last visited Mar. 1, 2014)

[93] EPA and Hardrock Mining: A Source Book for Industry in the Northwest and Alaska, App'x D, Effluent Quality (Jan. 2003), at http://yosemite.epa.gov/R10/WATER.NSF/Sole+Source+Aquifers/hardrockmining(last visited Mar. 11, 2013).

[94] SDEIS .p. 4-46

[95] Band Cmts. to DEIS at Ex. Y (E-mail from John Adams and Michael Liljegren (MNDNR) to Stuart Arkley (USACE), Op. concerning modeled groundwater drawdown impacts to surface features in the PolyMet CPDEIS, Additional PolyMet Peatland Data/Information (Feb. 1, 2009),).

groundwater transport occurs… travel times to evaluation locations are predicted to be in the *thousands of years*."[96]

In fact, information beyond the flow data collected by PolyMet implies that there may be substantial connection between the bedrock and surficial aquifers and that groundwater travel time will be *exponentially faster* than predicted.[97] Water quality data collected from two deep boreholes in the area where the Project mine pit(s) will be located found tritium and un-ionized ammonia nitrogen. Both tritium and un-ionized ammonia indicate a strong connection with surface water. Tritium indicates that the water found in the deep boreholes was on the surface sometime after 1950, during or after nuclear testing when atmospheric deposition of this pollutant occurred.[98] Un-ionized ammonia is produced by ore blasting activities. The bore holes where this pollution was measured are approximately one mile southwest of the Peter Mitchell Pit, which is the closest potential source of this pollution. Therefore, this data indicates that the PolyMet mine site is *already* hydrologically connected to the Peter Mitchell Pit through fractures.

Upon review of the Peter Mitchell pit discharge monitoring data for SD001[99], the Band found that the average concentration of un-ionized ammonia exceeded the 0.04 mg/l NPDES permit in 2006 and 2008. The distance between the Peter Mitchell pit and the Project proposed pit(s) is approximately one mile, indicating that groundwater travel time through bedrock fractures will be *orders of magnitude faster* than Project modeling suggests. Such a connection means that dewatering of the mine pits will cause significant drawdown of the water table in the surficial aquifer, potentially dewatering wetlands and ephemeral streams. This also indicates that when the mine pit(s) refill, polluted water will seep and leak out into groundwater surrounding the project.

6. Failure to properly identify risks to groundwater.

The Great Lakes Science Advisory Board to the International Joint Commission has stated that "[g]roundwater maintains stream flows and wetlands during dry periods, supporting significant ecosystem functions. Groundwater is an important source of drinking water in the Great Lakes Basin. 8.2 million people, 82% of the rural population, rely on groundwater for their drinking water."[100] In Minnesota, all groundwater is protected for drinking water supplies,

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[96] SDEIS at 5-33 (emphasis added).
[97] Tech. Docs. RS02, RS10, RS10A, RS74A.
[98] USGS, Tracing and Dating Young Groundwater (1999), at http://pubs.usgs.gov/fs/FS-134-99/ (last visited Mar. 3, 2014).
[99] MPCA, What's in My Neighborhood, DMR data for MN0046981-SD-1, 2006-2010, at http://www.pca.state.mn.us/customPHP/eda/stationInfo.php?ID=MN0046981-SD-1&ORG=WQDELTA (last visited Mar. 10, 2014).
[100] Great Lakes Science Advisory Board to the International Joint Commission, "Groundwater in the Great Lakes," (Feb. 2010), at http://www.ijc.org/files/publications/E43.pdf (last visited Mar. 10, 2014).

"constituting the highest priority use, and as such, to provide maximum protection to all underground waters."[101] Therefore, when considering water allocations, drinking water is the highest priority.[102]And as MPCA acknowledges in its groundwater profile for Northeastern Minnesota, including the Project area:

> Glacial aquifers are commonly thin and limited in their extent and yield. Bedrock aquifers have limited yield, generally from fractures; groundwater movement is difficult to define. There are no large-scale regional aquifers. The Biwabik Iron Formation is the only source of groundwater for many Iron Range cities.[103]

Groundwater contamination from the previous mining activities is still an issue near the LTVSMC tailings basin more than 20 years after operations ceased. Over the decades of operations at the LTVSMC tailings basin, thousands of gallons per minute of polluted tailings basin water were discharged through the bottom of the basin into groundwater.[104] This plume of contaminated water has been slowly moving down gradient into surrounding wetlands and the Embarrass River.[105] The monitoring wells that do exist near the tailings basin have concentrations of pollutants including iron, sulfate, manganese, aluminum, and fluoride that exceeded drinking water standards.[106] But because of the limited distribution of monitoring wells, the extent of the existing contaminant plume is not known. No bedrock monitoring wells have been drilled in the vicinity of the tailings basin. However, domestic wells near the northern property line show substantial contamination of the groundwater aquifer.[107]

Despite this, the SDEIS entirely skirts the question of *overall* impacts on the groundwater aquifer from putting an already-contaminated site back into production, and then releasing yet more contaminants. This approach is both deceptive and destructive. And "[f]racture zones separated by competent bedrock may create compartmentalized aquifers, while faulting, weathering and other large scale geologic processes may help induce connectivity between fracture pathways."[108] Blasting and shoveling ore will increase both the number of fractures and the connectivity of fractures potentially increasing baseflow and pit leakage into the bedrock layers below the bottom of the pit: the Virginia Formation and Biwabik Iron Formation.

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[101] SDEIS at 4-23.
[102] *Id.*
[103] MPCA, Groundwater Profile Arrowhead Region, at http://www.pca.state.mn.us/index.php/view-document.html?gid=6482 (last visited Mar. 3, 2014)
[104] Tech. Doc. RS74B.
[105] *Id.*
[106] MPCA Memo: Compliance Schedule Report, Cliffs Erie, LLC Hoyt Lakes Tailings Basin Area NPDES Permit #MN0054089 (Dec. 19, 2002).
[107] Barr Engineering Tech. Memo: Results of Tailings Basin Hydrogeological Investigation (June 2, 2009).
[108] P. Dietrich, ed., Flow and Transport in Fractured Porous Media (Springer: 2005 ed.)

The SDEIS asks the public to believe that the most environmentally sound way to dispose of highly reactive wasterock is to put it back into the pit(s) and cover the piles with water. However, when discussing back filling even the *least reactive wasterock*, the SDEIS states:

> *Backfilling would affect the water quality in the West Pit by increasing constituent loads*, so additional mechanical treatment of water in the West Pit may be required for a certain timeframe following backfilling. However, there would be no effect on surface water quality discharged to the environment because mechanical treatment of water from the West Pit would still be required in the long term.[109]

7. Insufficient project baseline data.

Project baseline data used for both the Mine Site and the Tailings Basin are insufficient.[110] A comparison of hydrologic data that was collected for two other projects in the region demonstrates that the PolyMet project is data-poor in the area of basic hydrology, much less mitigation.[111] Moreover, given the utility of the many existing studies of area hydrology,[112] it is perplexing that the preparers have continually refused to use them, even as tribal cooperating agencies have repeatedly requested that they be used. Just a few publicly available examples include: the Minnamax Project;[113] the LTVSMC Dunka Pit;[114] historic MNDNR fisheries documents;[115] and data required under the Cliffs Erie Consent Decree.[116] All these resources

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[109] SDEIS at 3-151.
[110] Barr Engineering, On-going Data Collection for the NorthMet Water Quality Modeling, (Feb. 2013).
[111] Letter of GLIFWC to Jon Ahlness and Stuart Arkley (USACE) (Feb. 6, 2009) (discussing need for additional hydrology analysis).
[112] Barr Engineering, On-going Data Collection for the NorthMet Water Quality Modeling (Feb. 2013).
[113] *See* Band's Cmts. to DEIS at Ex. O (NPDES Permit No. MNC047333); Ex. P (MPCA Office Memo, AMAX Exploration Unauthorized Discharge (Sept. 2, 1976)); Ex. Q (MPCA Office Memo regarding Potential Groundwater Plumes at Old AMAX Site (Dec. 13, 1989)); Ex. R (Review of the Leaching Tests Carried Out by AMAX Extractive Metallurgy Laboratory (Apr. 29, 1975)); and Ex. S (AMAX Exploration, Inc., Minnamax Project, Report of Laboratory Analysis of Water Quality Samples (Nov. 15, 1974)).
[114] *Id*. at Ex. T (EPA Office of Solid Waste, Tech. Doc.: Acid Mine Drainage Prediction (Dec. 1994)); Ex. U (MPCA Office Memo re. LTV Dunka Mine NPDES Permit MN0042579 (Apr. 14, 1988)); Ex. V (Status Report, Erie Mining Company Permit (Feb. 1985)); Ex. W (Letter from MPCA to Picklands Mather and Company regarding reclassification of Bob's Bay in Birch Lake and Unnamed Creek to Class 7 Waters (March 29, 1985)).
[115] *Id.* at Ex. X (MNDNR Fisheries Investigational Reports: Report on MN Wild Rice (1940); 1941 MN Wild Rice Crop; A Biological Survey and Fishery Management Plan for the Streams of the St. Louis River Basin; Some Aspects of the Chemistry of MN Surface Waters; Limnological Characteristics of Mine Pit Lakes).

should be used to supplement the hydrologic analysis and fully inform the permitting agencies and the public.

8. Uncharacterized surface water quality.

Surface water quality at the Project remains insufficiently characterized or left uncharacterized, and the defects in analysis in this area are profound. The limited data the SDEIS uses indicates that surface waters have already been adversely impacted by mining activity--which should give rise to more scrutiny, not less.[117] Contaminant transport modeling suggests that the Project will cause manganese, aluminum, and sulfate to exceed Minnesota Water Quality Standards ("MN WQS").[118] Mercury, sulfate, and specific conductance have already exceeded surface water criteria in surface water samples collected near the tailings basin at nearby Area Pit 5, and mercury and aluminum exceed surface water criteria in the Partridge River downstream of Colby Lake.[119] Aluminum, iron, manganese, and mercury all exceed MN WQS in Colby Lake.[120] Contaminants from the Project will likely contribute additional loading to these existing exceedences of MN WQS in the Embarrass River, Colby Lake, and the Partridge River. And, as a result of the Project, it appears that arsenic will exceed drinking water standards in Colby Lake.[121] *No* water samples have been collected from lakes near the tailings basin (including Hiekkilla, Mud, Kaunonen, or Hay Lakes) to determine if the pollutants found in the surface and groundwater at the existing tailings basin have caused contamination of those waterbodies. The SDEIS even acknowledges current exceedences: "…the existing LTVSMC Tailings Basin is not lined and currently releases seepage with elevated concentrations of sulfate, TDS, and hardness, among other constituents."[122] It just does not propose any effective means of remediating them.

9. Unrealistic claim of seepage capture efficiency rate.

The proponent's claim that 90 percent of the seepage from this tailings basin can be captured is unrealistic, to say the least. Tribes requested any example of the "90 percent or better" capture efficiency rate to be provided by the Co-Lead Agencies, but they were not able to

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[116] MPCA (for the State of MN), Cliffs Erie LLC Consent Decree (Mar. 27, 2010).
[117] Tech. Docs. RS22, RS63, RS74.
[118] *See, e.g.*, Minn. R. 7050.0220; 7050.0221 (Class 1 waters (domestic consumption): manganese 50 ug/l, aluminum 200 ug/l); 7050.0222 (WQS for Class 2 waters (aquatic life and recreation): mercury 1.3 ng/l, aluminum 87 ug/l); 7050.0224 (Class 4 waters (agriculture and wildlife): wild rice present sulfate 10 mg/l)).
[119] Tech. Docs. RS63, RS64.
[120] *Id.*
[121] SDEIS at 5-151.
[122] SDEIS at 5-5.

provide a single example anywhere in the world.[123] In fact, the only authority the Co-Leads have ever cited is from an EPA guidance document that provided:

> Most barriers in the study have been in place for fewer than 10 years; therefore, long-term performance can only be extrapolated… All sites included in the study were existing sites that had vertical barriers and, in many cases, caps. None of the sites has an engineered bottom barrier. Therefore, the effect of leakage through aquitards was not evaluated in this study.[124]

That report also indicated that "10% of the containment systems reviewed failed to meet the performance objectives and required corrective action, and 19% of the evaluated facilities did not have sufficient data to conclude whether the containment system was operating successfully or not."[125] In other words, even the Co-Leads' own authority does not support a 90 percent capture efficiency rate here.

Actual examples in northeastern Minnesota, from U.S. Steel Minntac[126] and the LTVSMC tailings basin seep SD0026[127] (the very tailings basin PolyMet proposes to re-use), demonstrate capture rates of *less than 60 percent*. Elsewhere, and similar to the Project's proposal, the Zortman-Landusky Mine in Montana installed containment and pump-back systems to be used in conjunction with a wastewater treatment facility. However, they "did not capture all surface and subsurface drainage."[128] The Molycorp, Inc. Mine site in New Mexico concluded that "[t]he pathway for contaminant migration is the leaching of tailing seepage downward from the tailing facility to *ground water that migrates through fractures* to surface water."[129] Therefore, it appears extremely unlikely that PolyMet will be able to capture 97 percent of the shallow seepage and 90 percent of the deep seepage from an unlined, leaking tailings basin.

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[123] ERM Responses to Action Items From January 27 Cooperating Agency Meeting (Feb. 11, 2014), attached at Ex. C.
[124] EPA, Evaluation of Subsurface Engineered Barriers...
[125] *Id.*
[126] Letter from J. Thomas (MPCA) to S.Coleman (U.S. Steel Corp.) (Apr. 7, 2008), attached at Ex. D.
[127] Tele. and email communications with John Thomas (MPCA) (Feb. 7, 2014), attached at Ex. E.
[128] EPA, Costs of Remediation at Mine Sites (January 1997); 4.2.12; Case Study No. 12 at 34, describing the Zortman-Landusky Mine, Montana, available on-line at http://www.epa.gov/wastes/hazard/tsd/ldr/mine/costs.pdf (last visited Feb. 17, 2014).
[129] EPA, Molycorp, Inc. Site, Proposed Cleanup Plan (December 2009) at 17, at http://www.epa.gov/region6/6sf/newmexico/molycorp/nm_molycorp_proposed_cleanup_plan.pdf

10. Ineffective seepage pump-back system.

The SDEIS provides that seepage from the existing LTV tailings basin continues to drain south to Second Creek long after LTVSMC operations have ceased.[130] Because the seepage will continue to be pumped back under the PolyMet Proposed Action, it "is not considered further in this discussion."[131] In Chapter 5, the SDEIS ensures the reader that the seepage collection system installed at the south side of the existing tailings basin has "essentially eliminated the flow of Tailings Basin seepage into Second Creek."[132] However, the Project proponent is well aware that that the seepage pump-back system is not nearly as effective as claimed in the SDEIS.[133] Because the pump-back system hasn't created the water quality improvements that were needed, the current owner of the tailings basin, Cliffs Erie,[134] now offers two proposed modifications: (1) dewater the pond that is an additional source of water contributing to water quality concerns (pending an EPA wetlands determination); or (2) create another barrier (dam) for collection and pump back between the existing dam and monitoring station SD026.[135]

Contrary to SDEIS claims, all of the seepage from SD026 is not being captured and therefore must be considered further in the SDEIS and project modeling. In fact, most of the tailings basin seepage flowing to SD026 is not being captured. Additional work will have to be done to achieve desired water quality improvements. It is unknown at this time if the modifications to the seepage capture system that have been proposed for SD026 will result in the required water quality improvements, or substantially increase capture efficiency.

11. Unjustified reliance on groundwater containment system.

The SDEIS provides that construction of a groundwater containment system along the north, northwest, and west sides of its unlined tailings basin "would capture virtually all of the Tailings Basin seepage presently flowing in those directions to restore water quality."[136] Without installing a single monitoring well in the bedrock to test this assumption, the SDEIS provides that this is "conservative" because the modeling done by the Project proponent assumes that bedrock hydraulic conductivity is "negligible."[137] So the SDEIS's conclusion that the method would be effective essentially is unsupported.

(last visited Mar. 10, 2014).
[130] SDEIS at 4-99.
[131] SDEIS at 5-89.
[132] SDEIS at 5-121, 5-158.
[133] Letter of Cliffs to John Thomas, MPCA, Compliance and Enforcement (May 7, 2013), Ex. B.
[134] If PolyMet receives a favorable Record of Decision, Cliffs has agreed to transfer title and existing permits of the tailings basin to PolyMet.
[135] *Id.*
[136] SDEIS at 5-174.
[137] SDEIS at 5-68, 5-69.

12. Unsupported storage coefficients in tailings basin model.

Moreover, the tailings basin model uses storage coefficients that are not found anywhere in peer-reviewed scientific literature.[138] This is significant because how much groundwater a geologic formation can contain (storativity or storage coefficient) and the rate of flow (hydraulic conductivity) is a function of the amount of open-pore spaces or fractures/faults in rock, the amount of water that infiltrates from the surface, and the groundwater gradient. The storage coefficients claimed for the entire plant site including the tailings basins is 0.20 for bedrock and 0.0002 for the surficial deposits,[139] meaning that the bedrock contains orders of magnitude more water than the surficial deposits. When questioned about these extraordinary storage coefficients the explanation was that the model was calibrated to match predicted and measured groundwater levels.[140] In sum, this model simulates a bedrock storage tank where lots of water goes in and virtually nothing comes out. Because this is not possible, these modeled hydraulic conductivity and/or modeled storage coefficients cannot reliably estimate the amount of seepage that will bypass the seepage capture system, nor the amount of time before seepage upwells in nearby wetlands or in the Embarrass River. Additionally, the model, although using "artesian" coefficients, does not allow the artesian water to surface, even in an area east of the tailings basin where head pressure suggests that the water would be 150 feet above the ground surface.[141]

13. Lack of consideration for bedrock seepage.

There is unquestionably a need for a slurry wall at the existing tailings basin if it is to be re-used by PolyMet - but in order to work even reasonably well, it would have to be flawlessly "keyed" into the bedrock without creating new fractures, and operate at an unrealistically high efficiency, in order to capture most of the seepage from the surficial aquifer. As noted previously, "[t]he pathway for contaminant migration is the leaching of tailing seepage downward from the tailing facility to *ground water that migrates through fractures* to surface water,[142] and even though the SDEIS states that 90% of the seepage from the surficial aquifer will be captured[143] there are no plans to capture any seepage flowing through bedrock fractures. In fact, bedrock is the part of this seepage capture system that is supposed to *prevent seepage from escaping* from the east side of the tailings basin.

> At the Plant Site, most groundwater flow occurs in an unconfined surficial groundwater system composed of unconsolidated sands, silts, and clays, and has a saturated thickness on the order of 7 meters. Below the surficial groundwater

[138] USGS, Trainer, F.W. and Watkins, Base-flow Characteristics of Streams, Water Supply Paper 2457 (1975).
[139] SDEIS at 5-41.
[140] ERM Responses to Action Items From January 27 Cooperating Agency Meeting (Feb. 11, 2014).
[141] PolyMet, NorthMet Water Modeling Data Package Vol. 2 – Plant Site v. 9 (Mar. 2013).
[142] EPA, Molycorp, Inc. Site Proposed Cleanup Plan at 17.
[143] SDEIS, p. 5-68

> system is a low-permeability fractured bedrock unit consisting of several rock types. Groundwater flow rates in the bedrock unit are much less than flow in the overlying surficial groundwater system.[144]

The SDEIS further states that "[d]ue to the very low hydraulic conductivity of the bedrock and because the slurry trench would be keyed into bedrock, the GoldSim model assumes that groundwater bypass via bedrock is negligible compared to that occurring in the surficial unit." [145] Without any examples worldwide of such high seepage capture efficiency, the SDEIS alleges that this is a fail-safe method of seepage collection able to collect 97 percent of the surficial aquifer seepage and 90 percent of the deep seepage through bedrock, and that no polluted water will seep from the tailings basin on the east side because bedrock conductivity is very low and the bedrock storage coefficient very high.

14. Mischaracterization of flowpaths in Modflow model.

"Semi-analytical flowpaths" for the tailings basin have been constrained in the Modflow model so that water cannot seep out of the east side of the tailings basin. However, winding underneath the east side of the tailings basin is a bedrock valley that used to be the headwaters of Trimble Creek. This valley is up to 50 feet deep and filled with glacial outwash. More water likely flows out of the east side of the tailings basin than does out the southern toe at monitoring site SD026. Therefore, without constructing the slurry wall containment system around the east end of the tailings basin, hundreds of gallons per minute of polluted water will drain into the Embarrass River watershed.

15. Dangerous placement of Hydrometallurgical Residue Facility.

The Hydrometallurgical Residue Facility ("HRF") is proposed to be located where the LTVSMC emergency overflow basin currently is. The photo on the cover of the SDEIS shows that emergency basin is flooded right now from groundwater seepage. Even though the PolyMet project proposes to use a double-liner to prevent leakage from the facility, head pressure from the existing seeps and springs at this site mean that the liners, even installed perfectly will not last long before rupturing. This is the most toxic of all the wastes created by the Project. Therefore, a new, dry location must be found for HRF placement. Furthermore, all cap and liner systems leak;[146] therefore, some pumping of water that enters the hydrometallurgical residue cells would be needed in perpetuity.

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[144] *Id.*
[145] *Id.*
[146] EPA Training Doc.: "Mining 101: Intro. to Non-Coal Mining Ops." (March 2007), available on-line at http://www.kuskokwimcouncil.org/documents/IGAP/Mining_101_Basic_Training_on_Mine_Waste42005.pdf (last visited Mar. 10, 2014).

16. Failure to account for pit lake treatment needs.

20 feet of pit wall will never be submerged and as such constitutes a perpetual source of mine related contaminants.[147] Because of continued inputs from the stockpiles, the tailings basins, and the pit walls, the pit lake could exceed surface water quality standards for thousands of years. Therefore, it is likely that the wastewater treatment facility ("WWTF") would need to operate for thousands of years in order to treat leachate from the tailing basin, stockpiles, and contaminated pit water.

17. General disregard for past experience at this and other sites.

The Band is profoundly concerned at the preparers' refusal to consider past state agency experience with this site that had disastrous consequences for water quality. The Band has located an MPCA document from the Minnamax Exploration Project, a test shaft drilled into the Duluth Complex, the rock formation where the mine would be sited, by AMAX Corporation in the 1970s, approximately three miles from the Project mine site.[148] This document states that water was encountered 147 feet below the surface infiltrating into the test shaft at approximately 14 gallons per minute and identified another potentially water bearing fracture zone at 900 feet below the surface.[149] This means that the volume of bedrock groundwater that may be encountered by the Project mine pit has been vastly underestimated.

Other MPCA documents detail an unexpected saline water discharge that resulted as part of the AMAX Exploration Project from a water pocket 1,391 feet below the surface.[150] The large quantities of saline water discharged, as much as 275 gallons per minute to Langley Creek, killed much of the vegetation en route.[151] Data show severe impacts to wetlands in the vicinity of the project.[152] Water from stockpiles that were minuscule in comparison to the stockpiles proposed for the PolyMet Project drained water with very high concentrations of nickel, cobalt, copper, zinc, and sulfate, and discharged that water into Langley Creek and the Partridge River.[153] The project polluted streams, groundwater, and a large wetland complex in its vicinity in order for the MNDNR to study potential impacts and mitigation strategies for non-ferrous mining. Yet the data collected from the AMAX project was not used to predict water quality or wetlands impacts presented in the PolyMet SDEIS.

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[147] DEIS at 4.1-66.
[148] Band's Cmts. on DEIS at Ex. Q (MPCA Office Memo regarding Potential Groundwater Plumes at Old AMAX Site (Dec. 13, 1989)).
[149] Band's Cmts. to DEIS at Ex. Z (MPCA Office Memo, Minnamax Exploration Project Tour (Nov. 24, 1976)).
[150] *Id.* at Ex. AA (MPCA Office Memo, AMAX Exploration, Incorporated Salt Water Spill (Sept. 8, 1976)).
[151] *Id.* at Ex. Z (MPCA Office Memo, Minnamax Exploration Project Tour (Nov. 24, 1976)).
[152] *Id.*
[153] *Id.* at Ex. BB (AMAX Exploration, Inc.: Drill Hole 303 Water Analysis Results (Aug. 11, 1976)).

Also ignored was experience with the Dunka Pit, located on the old LTVSMC site approximately five miles north and east of the PolyMet Project mine site. In the Dunka Pit, LTVSMC contacted the Duluth Complex and the Virginia Formation while mining for taconite in the Biwabik Iron Formation.[154] By 1991, LTVSMC had removed about 50 million tons of Duluth Complex material from the Dunka pit and placed it in "gabbro" stockpiles.[155] Monitoring of the drainage from these stockpiles beginning in 1976 revealed a decrease in pH and an increase in trace metals.[156] Copper and nickel concentrations as high as 1.7 and 40 mg/l respectively were observed in seepage/run-off from the Duluth Complex waste rock stockpiles and pH was observed as low as 5.0 at seep 1 between 1976 and 1980.[157] Most of the seepage from waste rock piles at the Dunka site was discharged to Bob's Bay in Birch Lake via Unnamed Creek.[158] A 1976-1977 study of trace metals in Bob's Bay found that concentrations of copper, nickel, cobalt, and zinc in the water of the Bay were higher than regional average concentrations and decreased with distance from the mouth of Unnamed Creek.[159]

Additionally, it was determined that Unnamed Creek contributed more than 90 percent of the trace metals to Bob's Bay load.[160] The October 2001 NPDES permit for this discharge expired in 2005[161] and another variance request is expected. The 2001 Dunka mine area permit has a variance provision allowing toxic pollutants to exceed the final acute value.[162] A Waste Water Treatment Facility ("WWTF") located at the site has been inactive because Cliffs Erie, LLC, the owner after LTVSMC, declared bankruptcy and claims it is simply too expensive to continue running. Unfortunately, the passive wetland treatment system did not function well enough to remove nickel and copper in waters still discharging from the mine pit and stockpiles to a concentration that comports to comply with Minnesota WQS,[163] and was rebuilt in 2010. Unfortunately, by 2012, copper, nickel, zinc, sulfate, and hardness concentrations from the treatment wetlands discharges (SD 8 and SD 9), were exceeding WQS. In accordance with a

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[154] EPA Office of Solid Waste: Tech. Doc.: Acid Mine Drainage Prediction, EPA 530-R-94-036 (Dec. 1994), available on-line at http://www.epa.gov/waste/nonhaz/industrial/special/mining/techdocs/amd.pdf (last visited Mar. 10, 2014).
[155] *Id.*
[156] *Id.*
[157] *Id.*
[158] *Id.*
[159] *Id.*
[160] *Id.*
[161] NPDES Permit MN0042579; MPCA, What's in My Neighborhoodhttp://www.pca.state.mn.us/customPHP/eda/stationInfo.php?ID=MN0042579-SD-8&ORG=WQDELTA (last visited Mar. 12, 2014).
[162] Cliffs Erie Variance Request for NPDES Permit MN0042579, attached at Ex. F.
[163] *Id.*

Consent Decree with the MPCA, Cliffs Erie is required to submit a plan for compliance with toxicity final concentration limits at SD008 and SD009 without a variance.[164]

Water quality impacts from prospecting and mining operations that have contacted the Duluth Complex are well known to the MNDNR and MPCA.[165] The State of Minnesota spent $4.3 million over three years in the late 1970s to produce the Regional Copper-Nickel Study, a 5-volume compilation of technical information regarding the potential impacts of copper-nickel mining in the Duluth Complex.[166] Nevertheless, predicted water quality impacts and ineffective mitigation methods referenced in the Study were ignored when the technical documents and SDEIS were drafted for PolyMet. Therefore, water quality impacts have likely been underestimated and the mitigations proposed may not be effective.

Similarly, the Mining Simulation Project (funded in part by a Minnesota Legislative appropriation of $185,000 to the MNDNR and MPCA) was a cooperative study to identify and resolve environmental issues associated with non-ferrous mining and to anticipate industry and government data needs to address those issues before commercial development occurred in Minnesota.[167] The study clearly identified those state ground and surface water quality regulations that would apply to copper-nickel mining operations in Minnesota, including applying the 10 mg/l sulfate criterion to effluent discharges where wild rice is present, and prioritized nondegradation of both surface and groundwater and protection of groundwater as a drinking water source, and rejected using natural wetlands for mine effluent treatment ("as a toxic metals dumping ground").[168]

Finally, the SDEIS lists the sulfur concentrations of Project waste rock ranging between 0.01-5.0%[169] with an average mass-weighted concentration of 0.15%. The Virginia Formation has the highest concentrations of sulfur 0.4 - 5.0%, and the Duluth Complex 0.13 – 0.6% sulfur. These concentrations are much higher than in Montana's Zortman-Landusky Mine waste rock (0.2% sulfur)[170] that has required perpetual wastewater treatment. And, like Zortman-Landusky, the Project proponent has suggested that "most (70 percent) of the NorthMet waste rock would be the low-sulfur, non-acid-generating" and will never cause acid mine drainage. However, the north wall of the east pit is composed of the Virginia Formation meaning that it will be exposed to both air and water and will likely contribute a substantial load of sulfate and metals to mine pit water.

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[164] Cliffs Erie Short Term Evaluation Mitigation Plan for Dunka Mine Wetland Treatment System Improvement (June 2010), attached at Ex. G.
[165] Band's Cmts. to DEIS at Ex. CC (MN Environmental Quality Board, The Minnesota Regional Copper-Nickel Study at Executive Summary (1979)).
[166] *Id.*
[167] Band's Cmts. to DEIS at Ex. DD (MNDNR, MPCA, E.K. Lehmann and Associates and the Project Environment Foundation, Report on the Mining Simulation Project (1990)).
[168] *Id.*
[169] SDEIS at 5-52.
[170] *See* Band's Cmts. on DEIS at Ex. E (Financial Assurance for Hardrock Mine Cleanup).

The cumulative public information regarding risks to area hydrology from mining the PolyMet site cannot be dismissed by inserting extrapolated data in place of measured data, or by cherry-picking measured data. Impacts to surface waters, groundwater, and wetlands for a project of this size and complexity demand a scientific, data-driven approach, rather than one based on opinion and selectively used data.

E. Wetlands (including discussion of 404 and 401 permitting issues).

The Project CWA Section 404 wetlands permit with corresponding CWA Section 401 certification were put on Public Notice at the same time the as SDEIS. This is problematic from a number of perspectives. As stated previously, *many mitigation measures were not identified* in the SDEIS, including the LEDPAs, nor are they evaluated using the required NEPA "hard look." There is *no agency-preferred alternative* identified in the SDEIS either. Combined, this makes it exceptionally difficult, and meaningless, to provide any input on the 404 permit or the corresponding 401 certification. Therefore, after an agency preferred alternative and the LEDPAs are identified, the USACE should re-notice the 404 permit and MPCA should re-notice the 401certification.

The purpose of an EIS is to be "forward looking" by predicting potential impacts and adequate mitigation for those impacts. The USACE has not developed a monitoring plan to assess after-the-fact Project impacts to wetlands, but claims that will be the way to best determine and mitigate indirect wetland impacts:

> Monitoring of hydrology and vegetation within potentially affected wetlands represents the best method for documenting actual community changes resulting from hydrology changes, understanding complex hydrologic conditions, and identifying potential future indirect effects related from mine features.[171]
> …
> Regardless of the method used, wetland mitigation for potential indirect wetland effects would be determined by the agencies during permitting. If the NorthMet Project Proposed Action were to be permitted, wetland monitoring would be conducted to identify if future indirect effects to wetlands would occur.[172]
> …
> The monitoring plan, developed as part of the Section 404 permit, would be based on those wetlands that have a high likelihood of indirect effects as a result of groundwater drawdown.[173]

So the SDEIS simply lacks sufficient detail even to comply with NEPA, and contains much less detail than is required to permit sufficient evaluation of potential wetland impacts.

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[171] SDEIS at 5-271
[172] SDEIS at 5-224.
[173] SDEIS at 5-273.

Additionally, the mitigation measures that the SDEIS does identify are inadequate as to wetlands, just as they are for purposes of water modeling. In particular, the tailings basin seepage capture system is insufficient because it is unlined and isn't designed to collect seepage from the east side. Waste rock mixing and segregation has not been demonstrated to be effective wetlands mitigation at other similar projects. Liners leakage rates are very optimistically estimated using solid waste landfill average leakage rates - but lined solid waste landfills are much smaller. There are no predictions regarding the possibility that tailings piped from the processing plant to the tailings basin could be spilled or what will happen if tailings embankments may fail.

Some of the wetlands that will be directly and indirectly impacted at the mine site are part of the 100 Mile Swamp, identified by a United States Fisheries Service biologist in 1997 as "lacking ecosystem representation in protected areas."[174] Interest in protecting the unique character of these wetlands was based on their "watershed integrity, the presence of riverine ecosystems, and large amount of interior forest present."[175] This information was further substantiated in a report by the MNDNR entitled "Evaluation of Selected Potential Candidate Research and Natural Resource Areas."[176] This document describes the 100 Mile Swamp wetlands as representing "the highest quality remaining examples of characteristic ecosystems in each ecological Landtype Association on the Superior National Forest."[177] Furthermore, the MNDNR County Biological Survey states:

> The Headwaters Site is the headwaters of four rivers: Stony River, Dunka River, South Branch Partridge River, and the St. Louis River, which is the second largest tributary to Lake Superior….[t]hese conservation areas are the best opportunities for conserving the full diversity of terrestrial and aquatic ecosystems and globally rare or declining species.[178]

Nearly 2,000 acres of coniferous bog wetlands will be directly impacted by mine pit(s) and stockpiles, or indirectly impacted due to drawdown and/or pollution. This is particularly significant to the Band because many tribally harvested resources are only available in

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[174] *See* Friends of the Boundary Waters Wilderness, "PolyMet Mine Site: Important Natural Area Will Be Obliterated for Dangerous New Mine," available on-line at http://www.friends-bwca.org/wp-content/uploads/polymet-mine-site-report.pdf (last visited Mar. 10, 2014).
[175] *Id.*
[176] *Id.*
[177] *Id.*
[178] Minnesota Biological Survey Division of Ecological Services, Department of Natural Resources, An Evaluation of the Ecological Significance of the Headwaters Site (Mar. 2007), at http://files.dnr.state.mn.us/eco/mcbs/evaluations/lmf/headwaters/hw_1.pdf (last visited Mar. 10, 2014).

coniferous bogs, and restoration of coniferous bogs is a very difficult and long process that has extremely low success rates.[179]

The SDEIS's failure to properly model and mitigate seepage and baseflow rates could result in profound impacts on wetlands. The estimates of groundwater drawdown are currently based on anecdotal and limited observations.[180] Because of the generally flat topography and extensive wetlands, mine pit dewatering would likely cause substantial dewatering in nearby wetlands. Estimated indirect impacts to wetlands due to groundwater drawdown at the mine site are summarized in SDEIS,[181] but without the use of a reliable groundwater model. Instead, dewatering impacts are assessed using an analogue method where wetlands impacted by another "equivalent" site are compared with wetlands surrounding the Project to provide an estimate of both the depth and distance from the mine pit(s) that dewatering occurs. The decision to use an analogue method came from the Wetlands Impact Assessment Planning work group process, in spite of Tribal Cooperating Agency objections. These objections include:(1) the PolyMet proposed mine pit will be hundreds of feet deeper than any of the "analogue" mine pits; (2) PolyMet mine pit walls will be crystalline and sedimentary bedrock versus the analogue mine pits in sedimentary bedrock only; (3) data collected from the site would be relatively inexpensive and should be used to inform impact assessment; and (4) relying on only a partial set of available "analogue" data as the source of information to estimate dewatering impacts is selective and not scientifically robust.

Without a quantitative assessment of the mine-related drawdown of the regional water table, there is no mechanism to develop an adequate indirect impact assessment method for wetlands. Based on the vegetation data collected from wetland delineations, it appears that groundwater-supported wetlands are common in the Project area.[182] The hydraulic conductivity in the unconsolidated deposits around the mine site ranges between 0.012 to 31 feet per day, indicating significant water movement within the surficial aquifer. In spite of the range of conductivities provided, however, the SDEIS states that perched wetlands cover over 50% of wetlands at the mine site.

Yet the Co-Lead Agencies suggest ombrotrophic bogs (meaning wetlands that receive all of their water and nutrients from precipitation) have no connection to groundwater, and therefore assume that drawdown will not affect these wetlands. But data supports at least a partial connection between ombrotrophic wetlands and groundwater. Therefore, if groundwater under these "perched" wetlands was drawn down by several feet, the new head pressure would lead to impacts to the wetlands because water would seep out of ombrotrophic wetlands in areas where there was a hydrologic connection to the saturated layer. Even the SDEIS acknowledges that saturated conditions exist within the unconsolidated deposits and the underlying bedrock, and

[179] Quinty, F., Rochefort, L., Peatland Restoration Guide.
[180] PolyMet, NorthMet Wetlands Data Package v. 7 (Mar. 2013).
[181] *Id.*
[182] *Id.*

that that recharge to the bedrock comes from leakage from the overlying surficial aquifer.[183] Given these statements describing vertical movement of water in the mine site area, a vertical hydrologic connection between ombrotrophic wetlands and the surficial aquifer is likely and the extent of the hydrologic connection should be investigated.

In response to the Co-Lead Agencies desire to use only analogue data to determine the Project dewatering effects, GLIFWC provided an independent analysis using information from other mine pits located on the Mesabi Range. Setting aside concerns that the distance zones used in the Co-Lead wetland impact analysis appear subjective, GLIFWC used similar impact zones so that the results could be compared to the Co-Lead Agency analysis presented in the NorthMet Project Wetland Data Package Version 7. The only substantial changes in GLIFWC's method of analogue assessment were to use *all available drawdown data for the Mesabi Iron Range,* and to not automatically exclude wetlands classified as ombrotrophic from being considered impacted by drawdown.

Up-front wetland should be required for all wetland acres classified in the severe impact category. All analogue data must be used to estimate wetland impacts, and additional hydrologic data collected from the mine site should be required.

Zone	SDEIS Selective Analogue Analysis of Likelihood of Dewatering Effects on Wetlands	GLIFWC Complete Analogue Analysis of Severe Dewatering Effects on Wetlands
Zone 1 (0 to 1000 feet)	929.15* acres	*3,188.62 acres*
Zone 2 (1000 to 2000 feet)	522.40** acres	*2458.12 acres*
Zone 3 (2000 to 5000 feet)	293.00*** acres	*273.01 acres*
Zone 4 (5000 to 10000 feet)	-	-
	1,744.50 acres	*5719.75 acres*

* High Likelihood of Impacts
**Moderate Likelihood of Impacts
***Low Likelihood of Impacts

The result of all these gaps and errors in analysis is that, among other problems, the proposed action do not comply with the requirements of Section 404(b)(1). The CWA does not allow a permit when there are practicable alternatives that would have fewer adverse effects, when the Project would lead to a violation of state water quality standards, or when a permit would cause or contribute to significant degradation of waters of the United States.[184] An agency-preferred alternative must be provided in addition to the LEDPA's before wetland impacts resulting from the Project can adequately be assessed, and before a 404 permit can be issued.

[183] SDEIS at 4-24.
[184] *Id.*; *see also* 40 C.F.R. §§ 230 *et seq.*

F. Lack of sufficient cumulative-impacts analysis throughout SDEIS.

As it has in all prior comments, the Band continues to object to the lack of a comprehensive cumulative-impacts analysis throughout the SDEIS. The CEQ has issued guidelines that illustrate the breadth of the required analysis, which the SDEIS purportedly relies upon.[185] Despite specific and repeated requests from tribal cooperating agencies, the Co-Leads did not elect to utilize a tool developed in 2011 by the EPA in cooperation with tribes, *Applying Cumulative Impact Analysis Tools to Tribes and Tribal Lands*, in order to discern potential cumulative effects to resources important to the tribes who retain usufructuary rights within the 1854 Ceded Territory. And the proposed Project is located entirely within the boundaries of the 1854 Ceded Territory.

In September 2013, the Tribal Cooperating Agencies collaborated to produce a 60-page Cumulative Effects Analysis, which appears at Attachment 3 to Appendix C to the SDEIS, along with other tribal comments.[186] The SDEIS failed to take into account most of the issues cited therein. So, in addition to reasserting and incorporating again all those comments, the Band yet again highlights the multiple examples in the document where cumulative impacts have not been addressed:

1. 1854 Ceded Territory.

There has been no analysis of the 1854 Ceded Territory as a discrete area of impact. The Band continues to ask that it be included. Tribal Cooperating Agencies believe the Cumulative Effects Analysis for land use should encompass the 1854 Ceded Territory, as the signatory Bands have lost access to substantial portions of it and the resources within. The 1854 Ceded Territory encompasses 6,283,836 acres in Northeastern Minnesota. Of that, 4,095,146 acres are public lands. The remaining 2,188,578 acres are private to private-industrial land. Band members generally do not exercise usufructuary rights on private lands without landowner permission, although the treaty does not hold that restriction. Lands within the 1854 Ceded Territory that have experienced urban and/or industrial development are permanently "lost" as a source of treaty resources. Cumulative impacts on the 1854 Ceded Territory must be evaluated.

2. Tribal Historic District.

As the Co-Leads area aware, Tribal Cooperating Agencies consider a 216,300 acre area bounded by the St. Louis River, Lake Superior, Lake Vermilion and the Beaver Bay to Vermilion Trail to be a Tribal Historic District, and the pertinent area for consideration of cumulative effects to cultural resources. In addition to the St Louis River, the area supports three major drainage systems, the Cloquet, Embarrass and Pike Rivers. Ancestors of present-day Band

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[185] *See Considering Cumulative Effects Under the National Environmental Policy Act*, at http://www.epa.gov/compliance/resources/policies/nepa/cumulative.pdf (last visited Mar. 11, 2014). *See also* 40 C.F.R. §1508.7 (defining cumulative impacts).

[186] SDEIS at App'x C (Tribal Agency Position Supporting Materials, 2013).

members resided in this area for centuries and many Bandmembers followed traditional practices extensively until about a generation ago. Then, the effects of mining devastated the rice beds in the Embarrass and St. Louis River watersheds and closed access to large tracts of public (particularly USFS) land including traditional harvest and collection areas. This proposed Tribal Historic District encompasses complex trail systems, Indian villages, trading posts, encampments for fishing, hunting, wild rice harvest and processing, sugar bush, and other traditional subsistence practices. It includes what was essentially a "water highway" used by the Ojibwe at the time of European contact, and subsequently by Voyageurs during the era of heavy fur trading. In addition, there are numerous medicinal plant gathering sites, Midewewin lodges, vision quest locales and other sacred places.

During the EIS scoping process for the Project,[187] the Co-Leads failed to ever identify any cumulative impact issues associated with cultural resources, and Tribal Cooperating Agencies were not invited to participate in scoping. The Band's and other Tribal Cooperating Agencies' comments on the June 2008 PDEIS, the 2009 CPDEIS, and the 2009 DEIS detailed the nature of these substantial cumulative impacts and the need for further analysis, and are forced to do so yet again here.

3. Water quality and quantity.

The SDEIS also fails to analyze cumulative effects on water quality and quantity. The relevant spatial scale for water quality and hydrologic cumulative effects analysis is the entire St. Louis River watershed. This watershed has experienced substantial historic, current, and proposed expanded mining activities, as well as other industrial, agricultural, and urban development. In addition to the direct surface water and wetland impacts (here meaning loss and/or degradation) from these activities, nearly half of the watershed has experienced hydrologic alteration from extensive ditching.

This analysis is particularly important in light of the current boom in mining. It is reasonably foreseeable that an additional 3,000 acres of wetlands within the watershed will be directly impacted by proposed new mining projects and expansions that are in active permitting and/or environmental review: the Project, U.S. Steel Minntac mine expansion; U.S. Steel Keetac expansion; United Taconite Tailings Basin 3 construction; and Cliffs Erie's mine pit expansion.

The SDEIS also fails to adequately analyze cumulative impacts to the water quality of the Partridge and Embarrass Rivers, much less the St. Louis River. In fact, in Colby Lake (the community water supply for the City of Hoyt Lakes), aluminum, iron, copper, and mercury concentrations already exceed Minnesota WQS.[188] Modeled concentrations of arsenic also exceed Minnesota WQS. This existing, large number of water-quality exceedences and the suite of constituents, particularly trace metals, that exceed WQS not only confirm the total lack of remediation for the previous mining activities at the LTVSMC site, but demonstrate the

[187] *See* Section 2.1 of the Final Scoping Decision Document.
[188] *See* PolyMet Tech. Doc. RS63.

importance of evaluating the cumulative losses to water quality. Community drinking water wells, wetland degradation resulting from dewatering, and pollution of community and private drinking water aquifers by previous mining activity must be assessed throughout the St. Louis River watershed as part of this Project, as well as for all the other mining projects currently underway.

4. Climate change.

The SDEIS does not determine climate change implications of the proposed Project. But the Project has proposed the largest direct wetland fill ever permitted in this region and would disturb extensive areas of peat, which is known to be an important carbon and methane sink. Wetlands in general are recognized as important carbon sinks and areas where wildlife seeks refuge as the climate warms. Nevertheless, to date, virtually all required wetland mitigation for mining impacts has been implemented *out* of the basin, representing a permanent loss of high quality ecological resources and functions.[189]

This omission undermines even the MNDNR's own work. The MNDNR's Moose Advisory Committee, which studies the decline of the moose population in northeastern Minnesota, has recommended preserving wetlands as sanctuaries for moose from heat stress related to climate change.[190]

Furthermore, underestimation of storm size and frequency is a serious problem for capture and treatment of polluted water from the Category 1 wasterock pile and tailings basin, tailings basin stability, storm water run-off from the Overburden Storage and Layout Area ("OSLA"), and mine pit dewatering. Storm size and frequency is known to be changing. These and other cumulative effects of climate change must be addressed.

5. Special concern species.

Also missing is cumulative-impacts analysis of culturally-important plant and animal species that are listed as "Species of Concern." For example, a substantial moose population has been identified in the mine site area by aerial and ground surveys. Moose are likely to be impacted by the disturbance of two of the few wildlife corridors remaining along the Mesabi Range, not to mention by the massive wetland impacts of this project. The rationale for a comprehensive cumulative impacts analysis for moose is found, again, in the MNDNR's own statements. This Co-Lead itself, in its Statement of Need And Reasonableness ("SONAR") related to Minnesota's List of Endangered, Threatened, and Special Concern Species, in 2012 proposed listing moose as a species of "special concern:"

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[189] SDEIS at 5-224.

[190] Report to the Minnesota Department of Natural Resources by the Moose Advisory Committee (Aug. 18, 2009) at 21, available at http://files.dnr.state.mn.us/fish_wildlife/wildlife/moose/mac/macreport.pdf (last visited Mar. 11, 2014).

> Between 1990 and 2000, the northwestern Minnesota Moose population underwent a substantial decline, and a 2007 Minnesota DNR aerial survey determined that as of that date, fewer than 100 Moose comprised the northwestern population. Aerial surveys currently estimate the northeastern Minnesota population at roughly 4,230 individuals. The northwestern Minnesota Moose population decline occurred in less than a decade. Recent surveys document a slow decline in the northeastern Minnesota Moose population.[191]

MNDNR directly linked this decline to climate change, land ownership, and forest management practices:

> Increased temperatures are likely to increase heat stress and lead to increased mortality within the state's remaining Moose populations. Changes in land ownership and changes in forest management practices within the state's Moose range may be having a significant adverse effect on the quantity and quality of the species' habitat within the state, and particularly on thermal refuges in warmer weather. The state's northeastern Moose population has not shown as rapid a decline, but is very likely to be dramatically impacted by rising temperatures resulting from climate change. This will likely lead to a marked decline in this population within the foreseeable future.[192]

There is no basis to dispute that the Project will have cumulative effects on the moose herd and Tribal harvest in the 1854 Ceded Territory. At a time when moose populations in Minnesota are declining, this analysis is particularly important and should have been done as part of this SDEIS.

6. Aquatic life impairments.

The Cumulative Effects Assessment Area defined by the Co-Leads for impacts to aquatic species is overly limited. It includes only the Partridge and Embarrass Rivers from their headwaters to a point approximately 15.5 miles downstream of the Project Proposed Action Activities, where the rivers form the St. Louis River. In this Area, the MPCA has assessed and identified waterbodies that are impaired for fish and/or benthic macroinvertebrate communities based upon recent monitoring data (since 2009).

But the draft 2012 Section 303(d) list prepared by the MPCA includes more headwaters streams and rivers in the St. Louis River watershed that are also impaired for aquatic communities. It is likely that the state-led stressor identification process will identify historic and existing mining operations as major causal factors for these impairments. The appropriate spatial

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[191] SONAR (Aug. 10, 2012), at http://files.dnr.state.mn.us/input/rules/ets/SONAR_all_species.pdf (last visited Mar. 11, 2014).
[192] *Id.*

scale for considering cumulative impacts to aquatic species is the entire St. Louis River watershed and Lake Superior Basin.

7. Mercury.

The SDEIS states that the current fish tissue concentration in five local lakes results in Hazard Quotients ("HQs") that exceed 1,[193] but gives no further information:

> The Hazard Quotient is the ratio of the mercury concentration in fish to a health-based target of 0.2 ppm; a Hazard Quotient greater than 1 exceeds the health-based target. The maximum incremental cumulative Hazard Quotient from the two projects over existing fish mercury concentrations is 0.08 for recreational anglers, 0.61 for subsistence/tribal anglers, and 0.54 for subsistence fishers. The NorthMet Project Proposed Action contributes approximately 59 to 92 percent of the incremental cumulative Hazard Quotient.[194]

In fact, Barr Engineering's July 2012 "Cumulative Impacts Analysis, Local Mercury Deposition and Bioaccumulation in Fish"[195] showed modeled contributions from both the Mesabi Nugget Large Scale Demonstration Plant ("LDSP") on the site and PolyMet. And the Barr report further provides the actual HQs, rather than just saying "they exceed 1." In one case, the existing HQ equals 46.2[196] - which is 46 times as high as the number where action is recommended.

This information should be explicitly included in the SDEIS for public review. While the incremental risk from the Project may be small, the *existing* risk is large and has not yet been addressed through a total maximum daily load ("TMDL") or other reduction program. The SDEIS also does not provide any rationale for more mercury to be added to a system that is already so high in mercury, only suggesting that a future TMDL should take care of the problem.[197] A more through cumulative effects analysis is required for mercury and the appropriate spatial scale for considering cumulative impacts includes the entire St. Louis River watershed.

8. Noise and Vibration

The cumulative effects of noise and vibration have not been adequately analyzed although they are discussed.[198] Meeting ambient noise standards is a different question than assessing impacts. Impacts should be fully characterized and contour maps showing overlapping

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[193] SDEIS at 6-58.
[194] SDEIS at 6-63.
[195] SDEIS, Electronic References Disc 1 of 2, Barr 2012b.
[196] *Id.*
[197] SDEIS at 5-432.
[198] SDEIS at 5-445 to 5-477.

noise pollution from different projects provided. Without this information, it is not possible to review the cumulative impacts of noise. In addition, the cumulative impacts of mine related vibration have not been assessed.

9. Hazardous materials transport.

The cumulative risk analysis of transportation of hazardous materials has not been analyzed. This should include rail car spills, pipeline ruptures, and truck transport accidents.

10. Post-closure impacts.

Post-closure impacts should also be included in the cumulative effects analysis because some mine features (e.g., pit lakes) would become permanent features of the landscape.

The cumulative impacts assessment deficiencies identified above and within Appendix C are not exhaustive. Instead, they are solely an attempt to illustrate the incredible lack of cumulative effects analysis in the SDEIS. Profound revision is needed to this section.

II. The SDEIS continues to lack sufficient characterization of existing and predicted impacts analysis of cultural resources and the 1854 Ceded Territory.

Just as the SDEIS does not evaluate cumulative impacts to the Ceded Territory, it does not fully evaluate direct and indirect impacts. Significant supplementation is needed.

A. Cultural resources.

Despite the passage of an additional four years after the DEIS's issuance, environmental consequences on historic properties have still not been completed.[199] Section 106 consultation between the USACE and Tribes is ongoing. Therefore, despite significant changes through recent, increased consultation with tribal cooperators, the *Cultural Resources* chapter of the SDEIS is still incomplete, and the requirements of the National Historic Preservation Act ("NHPA")[200] have not yet been fulfilled. The Project cannot proceed until they are. Under the NHPA implementing regulations for the protection of historic properties,[201] the Band is a "consulting party," and the lead agencies "shall consult with the THPO [Tribal Historic Preservation Officer] instead of the SHPO [State Historic Preservation Officer] regarding undertakings occurring on or affecting historic properties on tribal lands."[202] Additionally, the lead agencies must consult with any tribes that attach "religious or cultural significance to historic properties that may be affected by an undertaking," regardless of the location of the

[199] SDEIS at 5-673.
[200] 16 U.S.C. §§ 470 *et seq.*
[201] *See* 36 C.F.R. §§ 800 *et seq.*
[202] 36 C.F.R. § 800.2(c)(2)(i)(A).

historic property.[203] The agencies must give a tribe "a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties, *including those of traditional religious and cultural importance*, articulate its views on the undertaking's effects on such properties, and participate in the resolution of adverse effects."[204]

The regulations go on to inform agencies that they "should be aware that frequently historic properties of religious and cultural significance are located on *ancestral, aboriginal, or ceded lands of Indian tribes . . . ,*" as in the Ceded Territory.[205] One aspect of the identification of such historic properties is through gathering information from consulting tribes, through a variety of methods.[206] Where, as here, there are historic properties affected, then there is an entirely separate level of adverse-effects assessment that must be performed, again in coordination with consulting agencies.[207] In light of these rules, and as the chapter itself acknowledges, it is apparent that far more consultation and site work must be done to comply with Section 106.

1. Inadequate TCP identification.

A key piece of the work that still has not been completed, despite some progress, is the traditional cultural property ("TCP") studies. The National Register of Historic Places defines a TCP as "one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history and (b) are important in maintaining the continuing cultural identity of the community."[208] An appropriate investigation of the Project site using this standard, and in cooperation with all involved THPOs, must be performed and properly documented.[209] They will require a high level of tribal input and consideration of seasonal changes. As noted in the chapter, consultation is underway on this topic, but is far from complete.

The SDEIS must include language to the effect that the Band continues to take the position that the Ceded Territory is itself a TCP and does not agree with the USACE's determination that it is not.[210] Nevertheless, in the interests of timely evaluating Project risks and

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[203] *Id.* at § 800.2(c)(2)(i)(B)(ii).
[204] *Id.* at § 800.2(c)(2)(ii)(A) (emphasis added).
[205] *Id.* at § 800.2(c)(2)(ii)(D) (emphasis added). *See also* § 800.3(f)(2) *Involving Indian tribes and Native Hawaiian organizations.*
[206] *Id.* at § 800.4(a)-(b).
[207] *See generally id.* at§ 800.5.
[208] National Register Bulletin #38, "Guidelines for Evaluating and Documenting Traditional Cultural Properties," (1998) at 1, available at the National Park Service website, http://www.nps.gov/nr/publications/bulletins/nrb38/.
[209] *Id.*
[210] *See* Band Cmts. to DEIS at Ex. EE (Letter of S. Van Norman (Counsel for Band) to J. Ahlness (USACE), S. Arkley (MNDNR), V. Hauser (ACHP) (March 9, 2009) (requesting that

mitigation, the Band agreed, for the time being, to proceed in accordance with the USACE's offer to fully evaluate the Ceded Territory pursuant to its trust responsibility, including all factors that would be considered in a TCP analysis.[211]

2. Underestimation of the APE.

The Project Area of Potential Effect ("APE") for cultural resources is divided into two separate sections surrounding the proposed mine site and the proposed plant site. These areas do not encompass the true extent of the APE. Instead, they represent the USACE permit area(s) *within* the true APE. This is despite the fact that the Advisory Council on Historic Preservation ("ACHP") previously advised the USACE that this is not an appropriate way to determine the APE.[212] The ACHP stated that "the Corps should be mindful of its responsibility to consider the reasonably foreseeable effects, including long term and cumulative effects the expansion activities could have on historic properties."[213] It went on to reiterate that Section 106 defines undertaking as a "project, activity or program funded in whole or part under the direct or indirect jurisdiction of a Federal Agency, including . . . requiring a Federal permit, license or approval" (36 CFR 800.16[y])." But the ACHP explicitly stated:

> The undertaking is not the federal issuance of a permit; it is the larger project that includes components that are the specific subject of the permit. The federal agency must consider the effects of the overall project (undertaking) including the permitted components. Once the undertaking has been properly defined, only then can the APE be properly delineated.[214]

Until the cumulative effects analysis of the Project is better represented, the agency preferred alternative is defined, and the LEDPAs identified, it is premature to delineate the APE. And it is also inappropriate to define the APE as only the permitted areas of the Project.

USACE recognize Ceded Territory as TCP and engage in further Section 106 consultation); Ex. FF (Letter of T. Cameron (USACE) to S. Van Norman (April 17, 2009) (refusing to recognize TCP without further consultation)); Ex. HH (Letter of S. Van Norman to T. Cameron (May 13, 2009) (asking again for further Section 106 consultation), Ex. GG; Letter of S. Van Norman to T. Cameron (May 15, 2009) (providing additional support for TCP designation)); Ex. II (Letter of S. Van Norman to T. Cameron (Aug. 24, 2009) (requesting response to May 15 letter)); Ex. JJ (E-mail of T. Cameron to S. Van Norman (Sept. 21, 2009) (responding to May 15 letter with suggestion of action under trust responsibility)); Ex. KK (Letter of S. Van Norman to T. Cameron (Nov. 30, 2009) (accepting proposal but maintaining TCP argument)).

[211] *Id.* at Ex. JJ (E-mail of T. Cameron to S. Van Norman (Sept. 21, 2009) (responding to May 15 letter with suggestion of action under trust responsibility)).

[212] Letter of C. Vaughn (ACHP) to T. Cameron (USACE) (Jan. 8, 2014), attached at Ex. H.

[213] *Id.*

[214] *Id.*

3. Specific TCPs.

The remaining comments concern the properties of spiritual and cultural significance to the Bands: the Mesabe Widjiu; the Beaver Bay to Lake Vermilion Trail ("BBLVT"); and Spring Lake Mine Sugarbush. Mesabe Widjiu is correctly identified as a sacred landform but needs to be considered in its entirety instead of looking at only the area within the Project. The segment that is within the project area is small, but vital to the property. Adverse effects to any portion of the Mesabe Widjiu will negatively impact the entire feature.

The BBLVT trail is "associated with the lives of persons significant in our past,"[215] including John Beargrease,[216] Peter Gagnon,[217] and Alec Posey.[218] In more recent history, Bois Forte Band members used a sugarbush near the plant site and harvested wild rice in the Embarrass River near the LTVSMC tailings basin.[219] This trail is one of many that crisscrossed northeastern Minnesota and extended to the border lakes long before the fur trade and continued to be used through the early 20th century. To date, the BBLVT has not been fully researched or rigorously field-verified within the project area. Although the Superior National Forest Heritage Program reviewed the Government Land Office plats and conducted field investigations on Superior National Forest land and the USACE in conjunction with Band staff conducted field investigations to identify pieces of the BBLVT corridor, more investigation is required. Additional fieldwork should be conducted in the spring or fall when ephemeral features such as foot trails are less easily concealed by vegetation and more easily discerned.

The Bands remain skeptical of the Co-Lead Agencies' claim that there will be no adverse effect to the Spring Lake Mine Sugarbush from the Project. Indirect effects, through dust deposition and unauthorized collection of historic objects, are anticipated because the sugarbush is situated immediately adjacent to the proposed plant site. Because the tailings basin is in very close proximity to the sugarbush and dust control measures are required for all tailings basins in Minnesota, the long-term detrimental effects of dust on tree leaves must be considered.

The three properties would benefit from additional investigation. The sugarbush has not been formally recorded. The trail has been adequately documented within the SNF proposed land exchange, but requires additional survey in the upland areas of the project area. Mesabe Widjiu should be considered in its entirety. All three should be formally nominated to the National Register of Historic Places.

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[215] 30 C.F.R. Part 60.4(b)
[216] D. Lancaster, *John Beargrease*….
[217] Bardon, John A., Superior Wisconsin Papers.
[218] Thomas Vennum, Jr., *Wild Rice and the Ojibway People*.
[219] Rose Berens, Bois Forte THPO (2010).

B. Fisheries.

The Project is predicted to increase mercury loadings in the Embarrass River, but decrease mercury loadings in the Partridge River:[220]

> Treated effluent would be used to augment flow in several Embarrass River tributary streams and Second Creek in the Partridge River watershed that would otherwise experience reduced flow because of the groundwater containment system. Additional water for flow augmentation in the nearby tributaries would be pumped from Colby Lake at periods during mine operations and reclamation.[221]

On the face of it, stream augmentation mitigation seems like a good idea. Unfortunately, Colby Lake water has high mercury concentrations that exceed the Minnesota WQS for wildlife. Colby Lake water used for augmentation will add mercury to the Embarrass River watershed both directly and indirectly by drying and re-wetting peat. High mercury concentrations in fish is a significant concern in the Embarrass River now, and mercury will only increase if the Project is allowed to use Colby Lake water for stream augmentation.

Dewatering peatlands will also amplify water table fluctuations because peat has high water storage capacity and releases water more slowly than other surficial deposits. Drying and re-wetting peat will increase mercury methylation and release. Peatlands store methane and carbon that will be released into the environment when overburden is removed from the mine pits or during periods of dewatering. This is important in the context of subsistence fisheries and climate change because the temperature of water directly affects the oxygen content and defines what fish can survive. Mercury is also known to bioaccumulate in fish at a faster rate in warmer water.[222]

Several lakes and the Partridge River watershed are likely to be negatively affected, which will impact fish species and thus the Band's 1854 Treaty rights to harvest fish in those water bodies. The SDEIS as written fails to mitigate the costs to fisheries and wildlife species that are protected under the 1854 Treaty. Treaty-reserved fishing rights cannot be fully exercised when fish consumption must be restricted for health reasons to one or two meals per week. Any increase of methylmercury bioavailability in the Embarrass River, Partridge River, or St. Louis River watersheds constitutes a significant adverse impact to a critical trust resource. Not only must this impact be fully evaluated, but it must be fully mitigated.

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[220] SDEIS at 5-8.
[221] *Id.* at 5-6.
[222] J. Dijkstra, et al., "Experimental and Natural Warming Elevates Mercury Concentrations in Estuarine Fish" (Mar. 12, 2013), at http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0058401 (Mar. 11, 2014).

The SDEIS does not adequately address the potential impacts to Band members of a significant increase in mercury in fish harvested both on-Reservation and in Ceded Territory waters. The SDEIS actually admits:

> Operation of the NorthMet Project Proposed Action would make the Mine Site unavailable for subsistence use; noise and other consequences of operations could affect migration or other animal species behavior in the vicinity of the Mine Site and Plant Site (see Section 5.2.5, Wildlife). Operations could affect individuals who consume fish harvested from nearby waterbodies. The NorthMet Project Proposed Action would increase mercury concentrations in the Embarrass River Watershed, as well as some nearby lakes, although it would decrease mercury concentrations in the Partridge River watershed (see Section 5.2.2.3.4). As described in Section 4.2.10.1.6, subsistence fishing and consumption is a common activity for Native American bands in the 1854 Ceded Territory. Members of the Grand Portage and Fond du Lac bands are known to consume substantially more fish than the assumed statewide average. As a result, increased mercury concentrations, and associated increases in mercury bioaccumulation in fish tissue could therefore constitute an EJ impact for Band members and other subsistence consumers of fish.[223]

Yet the SDEIS offers no mitigation for these known losses. The SDEIS must be revised to include sufficient analysis and mitigation.

Moreover, Minnesota's mercury TMDL process will not adequately address the fish consumption impairment in these waterbodies, and any new discharges that would result in further degradation to waters with an existing water quality impairment are not be legally permitable under the CWA.[224]

Finally, both the Grand Portage and Fond du Lac Bands have made efforts to restore Lake sturgeon (*Acipenser fulvescens*) in Lake Superior, the St. Louis River, and the Pigeon River. Lake sturgeon were once present in the St. Louis River and Lake Superior. Lake sturgeon are long-lived fish that are slow to reach reproductive maturity. Most sturgeon will spend a portion of their life in the river they hatch from, but eventually migrate to lakes. Loss and degradation of habitat including the installation of dams and changes in land use, coupled with over fishing caused sturgeon to be considered nearly extirpated in the portion of the St. Louis River upstream of the Fond du Lac Dam. Lake sturgeon are very sensitive to changes in water salinity. [225] Water with high concentrations of salinity can drastically reduce recruitment of young-of-the-year sturgeon. Salinity within the St. Louis River watershed has increased remarkably from the headwaters to the estuary largely as a result of mining activities. The

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[223] *Id.*
[224] *See Friends of Pinto Creek v. E.P.A.*, 504 F.3d 1007 (9th Cir. 2007).
[225] D.J. McKenzie, et al., Effects of Acclimation to Brackish Water on Tolerance of Salinity Challenge by Young-of –the-Year Adriatic Sturgeon (June 2001).

cumulative effects of invasive species, mining, and Project effects on sturgeon must be considered and the SDEIS revised.

C. Wild rice.

Wild rice is a culturally significant resource for the tribes in Minnesota. From historical reports,[226] Band member accounts,[227] and current MNDNR and tribal reports,[228] wild rice has declined significantly throughout Minnesota, and in southern Minnesota wild rice has virtually disappeared.

The Embarrass River, Second Creek, the Partridge River, and the St. Louis River all contain wild rice beds downstream of the Project,[229] as the SDEIS acknowledges: "The sulfate released from the NorthMet waste rock and tailings is especially important because there are waters supporting the production of wild rice that are downstream from both the Mine Site and Tailings Basin. Research indicates that elevated sulfate concentrations affect the growth and viability of wild rice."[230]

Wild rice waters are not only protected under the 1854 Treaty but under Minnesota State law.[231] Given the obviousness of the threatened impact to such wild rice beds, additional analysis and mitigation must be included throughout the SDEIS.

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[226] A.E. Jenks, The Wild Rice Gatherers of the Upper Great Lakes: A Study in American Primitive Economics (Washington: GPO, 1901), available on-line at http://greatlakeswater.uwex.edu/library/articles-and-white-papers/wild-rice-gatherers-upper-lakes-study-american-primitive-economics (last visited Mar. 11, 2014).

[227] Rosemary Berens, Bois Forte THPO. In consultations, Berens related the story a Bois Forte elder from Vermillion, whom Berens had November 2010, who said Band members from the Vermillion sector of Bois Forte used to harvest rice on both the upper and lower Embarrass River. When she asked him where, he simply stated, "where the rice was." It grew in different places each year.

[228] *See, e.g.*¸ 1854 Treaty Authority, "Wild Rice Survey" (including list of wild rice waters in the 1854 Ceded Territory), available at http://1854treatyauthority.org/wildrice/survey.htm (last visited Mar. 11, 2014); MNDNR, "Wild rice management," available at http://www.dnr.state.mn.us/wildlife/shallowlakes/wildrice.html (last visited Mar. 11, 2014).

[229] SDEIS at 5-21.

[230] SDEIS at 5-5.

[231] *See, e.g.*, Table 4.1-10A, *Summary of NorthMet Project Site Water Quality Classifications by Water Body*. *See also* Minn. R. 7050.0224 subp. 1, which states:

> In recognition of the ecological importance of this resource, and in conjunction with Minnesota Indian tribes, selected wild rice waters have been specifically identified [WR] and listed in part 7050.0470, subpart 1. The quality of these waters and the aquatic habitat necessary to support the propagation and maintenance of wild rice plant species must not be materially impaired or degraded. If the standards in this part are exceeded in waters of the state that have

Because wild rice grows on the Embarrass River, the lower Partridge River, and the St. Louis River; therefore, the 10 mg/l sulfate standard under MNWQS applies.[232] Furthermore, there are other projects (e.g., Mesabi Nugget and Laskin Energy) that are discharging water with elevated pollutants, including sulfate.

The MPCA has determined that the 10 mg/l standard can be applied seasonally, only when wild rice is in its growing season. MPCA guidance for the PolyMet project provides:

> There appears to be an overall consensus from experts that the primary period of both nutrient uptake from the water column and susceptibility of the wild rice plant to high sulfate levels is from seed germination to leaf emergence with additional information suggesting a secondary period when the seed is developed in mid to late August. Assuming germination takes place at ice-out (which is generally mid April to mid May in the northern half of the state) and leaf emergence takes place by early July, it seems reasonable to determine that the main period of susceptibility extends primarily from mid April to mid July with a secondary period in August.[233]

Correspondingly, the SDEIS provides:

> PolyMet is not seeking application of the seasonal component of this standard for the NorthMet Proposed Action as currently proposed and evaluated in this SDEIS. During closure, PolyMet has indicated a desire to transition to non-mechanical treatment once pilot-testing and modeling indicate water quality standards could be met, *which potentially could include application of the wild rice seasonal standard,* but these are beyond the scope of this SDEIS.[234]

Several other sections indicate that the Project closure goal is to transition from mechanical water treatment to passive water treatment systems. The SDEIS further provides:

> PolyMet proposes to install a West Pit overflow non-mechanical treatment system at the Mine Site to replace mechanical treatment of the West Pit overflow water during the long-term closure phase of the NorthMet Project Proposed Action. The West Pit overflow non-mechanical treatment system would be designed to discharge only during September and October in order to comply with the

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> the Class 4 designation, it is considered indicative of a polluted condition which is actually or potentially deleterious, harmful, detrimental, or injurious with respect to the designated uses.

[232] *Id*.
[233] SDEIS Electronic References, Disc 2 of 2, MPCA 2011b.
[234] SDEIS at 5-25 (emphasis added).

> seasonal sulfate discharge criterion for wild rice downstream of the Mine Site (PolyMet 2013g).[235]

The Band fundamentally disagrees with any seasonal sulfate release in wild rice waters, whether now or later. There is no scientific basis for stating that seed is not affected by high sulfate levels while it lays dormant over the winter, or that the effects of high-sulfate water would not remain or continue into the summer. In fact, recent lab and field data collected by MPCA itself indicates that a seasonally applied sulfate standard is not protective of wild rice, and therefore the standard should apply all year instead of seasonally.[236] Therefore, it is expected that MPCA will be revising its own guidance on this point.

Field data collected by Barr Engineering in 2011 indicates that mining effluent has already impacted the Embarrass River, exceeding the Minnesota WQS criteria for the protection of wild rice by orders of magnitude.[237] Any language casting doubt on the current applicability of this standard, or suggesting that seasonal discharge is acceptable, should be removed. Wild rice in the Embarrass River endures despite degraded water quality. It is likely that the degraded water quality has decreased the abundance of wild rice in the Embarrass River. Impacts to wild rice in the vicinity of the Project must be more rigorously analyzed and reported, and cumulative impacts to wild rice in the 1854 Ceded Territory also need to be addressed. The Project must also provide mitigation for impacts to wild rice.

D. Moose.

Moose are central to Ojibwe lifeways:

> Someday the moose, too, may be gone. Then all we'll have left is stories to tell. Moose are at the center of our culture. Without them, we will cease to be Ojibwe. We've hunted moose since *chemaywe'ya*, the way-back time, for subsistence. One moose can feed a family for several seasons.[238]

As discussed elsewhere, the Minnesota moose population is under a long-term population decline.[239] The Project will certainly do nothing to aid in the recovery of moose and is likely to reduce available habitat, impact travel corridors, and increase greenhouse gases. Impacts on

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[235] SDEIS at 5-216.
[236] Preliminary studies available at http://www.pca.state.mn.us/index.php/water/water-permits-and-rules/water-rulemaking/minnesotas-sulfate-standard-to-protect-wild-rice.html (last visited Mar. 11, 2014).
[237] Barr Engineering, 2010 Wild Rice and Water Quality Monitoring Report, SDEIS Electronic References, Barr 2011a
[238] *See* Cheryl Lyn Dybas, "Minnesota's Moose: Ghosts of the Northern Forest?" 59 BioScience 824 (Nov. 2009), available at http://www.jstor.org/stable/10.1525/bio.2009.59.10.3 (last visited Mar. 11, 2014).
[239] *Id.*

moose and habitat are impacts on the Band's cultural resources and must be analyzed as such in the SDEIS.

E. Band member use of other usufructuary resources.

There still has not yet been sufficient evaluation of Band member use of vegetation and other usufructuary resources in the APE, and there is no permissible basis to omit such evaluation where the USACE and other federal permitting agencies have a trust responsibility to the Band to maintain treaty resources in the 1854 Ceded Territory. The APE for the Project was not determined until August 11, 2009, after tribal cooperators insisted upon it,[240] and tribal consultation is ongoing. Since 2009, the size of the APE has been significantly diminished to the point of being the Project permitted area and nothing more.

Although the permitted area is significantly disturbed and will be for the foreseeable future, the closure and reclamation plans will have a significant effect on native vegetation as it is reintroduced.[241] The prevalence of invasive, non-native species and their ability to out-compete native plants in disturbed areas, coupled with PolyMet's plan to introduce non-native and invasive species to this area, would result in significant impacts to cultural resources that have not been discussed in the SDEIS. Moreover, as part of the 1854 Ceded Territory, this is an area of importance for traditional plant and medicine harvest, and has great religious significance in connection with the Ojibwe Seventh Generation Prophecy. The closure and reclamation plan should be revised to incorporate native species.

Finally, several wildlife species of high cultural and present-day value to the Band exist in the APE. Some of these include moose, whitetail deer, wolf, fisher, marten, and lynx, to name a few. As discussed elsewhere, mining operations are likely to reduce available wildlife habitat and impact travel corridors. Water, air, and noise pollution, combined with increased road density, have been shown to have negative impacts on most boreal wildlife species including wolves, moose, and lynx. While the SDEIS provides that displaced wildlife will face increased competition for resources, no mention is made whether the displaced animals may cause populations in adjoining territory to approach or exceed carrying capacity. The SDEIS fails to assess cumulative effects of wildlife population changes, not only in the project area, but the entire region.

F. Socioeconomics.

Executive Order 12898 specifically identifies Environmental Justice issues to be addressed regarding Native American Populations.[242] But in the SDEIS *Socioeconomics*

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[240] *See*, *e.g.*, Band's Cmts. to DEIS at Ex. GG (E-mail of J. Ahlness (March 13, 2009), Ex. B to Van Norman Letter (May 13, 2008) (stating no APE will be designated)).
[241] SDEIS at 5-359.
[242] Available on-line at http://www.epa.gov/Region2/ej/exec_order_12898.pdf (last visited Feb. 1, 2010).

chapter, none of the issues identified in the Executive Order have been addressed, despite the Band repeatedly asking for further analysis, both before and after the DEIS was issued. It is the Band's position that any impacts to natural resources will disproportionately affect tribes due to their subsistence consumption of wild rice, fish, and other wildlife, and gathering of traditional plants and medicines within the 1854 Ceded Territory. Native Americans should be specifically evaluated as an affected population throughout this section.

EPA, in an attempt to assist the Co-Lead Agencies analysis of the value of protecting water resources, provided a guidance document titled "The Economic Benefits of Protecting Healthy Watersheds."[243] It states:

> Healthy intact watersheds provide many ecosystem services that are necessary for our social and economic well-being. These services include water filtration and storage, air filtration, carbon storage, nutrient cycling, soil formation, recreation, food and timber. Many of these services have not been monetized and therefore the economic contributions of healthy intact ecosystems are often under-valued when making land use decisions. Ecosystem services provided by healthy watersheds are difficult to replace and most often very expensive to engineer. An engineered ecosystem service replacement may only provide a fraction of the services provided by highly functioning natural systems. Preventing impairments in healthy watersheds protects valuable ecosystem services that provide economic benefits to society and prevent expensive replacement and restoration costs.[244]

But the value of natural resources maintained in good condition is simply not represented in the SDEIS. Nor is the economic value of clean water provided or assessed. EPA's guidance even provides a monetary value for water resources, but the Co-Leads failed to take this into account. Instead, the socioeconomic evaluation is simply a discussion of the short-term benefits of the project, without evaluating long-term socioeconomic effects of the loss of healthy watershed ecosystems on communities during and after mining ceases.

The SDEIS also speculates that the tribes will benefit economically from the Project through additional visitation to Band-operated Casinos, but provides no data to back up the statement: "Increased employment and income associated with the NorthMet Project Proposed Action could increase visitation and revenues at [area tribal gaming] facilities."[245] This statement is entirely unsupported by any market analysis and must be deleted from the socioeconomic assessment of the Project.

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[243] EPA, The Economic Benefits of Protecting Healthy Watersheds (Apr. 2012), at http://water.epa.gov/polwaste/nps/watershed/upload/economic_benefits_factsheet3.pdf (last visited Mar. 11, 2014).
[244] *Id.*
[245] SDEIS at 5-509.

Conclusion

The SDEIS must be substantially supplemented to ensure that environmental consequences have been fairly evaluated and to provide a full opportunity for agency and public review. First and foremost, the Band and others have repeatedly asked for justification for the conclusion that underground mining is not viable. The type and estimated amount of financial assurance that would be sufficient for reclamation, closure, mitigation, and remediation of adverse effects from the Project and pre-existing contamination should be disclosed in the SDEIS. The water quality and quantity impacts analyses have to be supplemented to provide scientifically-supported hydrologic and geochemical characterizations, using all existing data, before reasonable estimations of impacts to water resources, and strategies to mitigate those impacts can be determined. There must be a scientific assessment of the mine-related dewatering of the regional water table so that an impact assessment of drinking-water resources and wetlands can be conducted. The SDEIS must make a reasonable effort to assess the Project's potential for impacts on the exercise of treaty rights. The SDEIS lacks an agency-preferred alternative and LEDPAs, as we as omitting sufficient mitigation measures under NEPA. The mitigation measures in the SDEIS are inadequate, particularly the tailings basin seepage capture system. It requires substantially more transparency regarding post-closure water treatment plans for WQS compliance. This singular issue has significant repercussions for the public interest determinations and the amount of financial assurance that would be required.

These and the many other problems the Band and other commenters have identified can only be corrected through a significant supplement to the SDEIS after proper analysis and full consultation. In sum, the SDEIS is best viewed as a list of unrealistically optimistic predictions, with only partial public-interest analysis. It must be substantially improved and legally cannot be accepted as a sufficient justification for this Project.

Sincerely,

Margaret Watkins
Environmental Department
Grand Portage Band of Chippewa

Encl. (Index and Exs. A-I)