

**Comments on the
Supplemental Draft Environmental Impact Statement
for the NorthMet Mining Project and Land Exchange**

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Submitted by:

**Save Our Sky Blue Waters
Save Lake Superior Association
Center for Biological Diversity
Friends of the Cloquet Valley State Forest
The Sierra Club**

Prepared by:

**Jane Reyer
1625 E. First St. Apt. 2
Duluth, MN 55812
jane.reyer@gmail.com**

**Marc Fink
Center for Biological Diversity
209 E. Seventh St.
Duluth, MN 55805
mfink@biologicaldiversity.org**

**Doug Wolf
Principle, Alto Street Environmental Consulting**

Ryan Talbott

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I. The SDEIS Does Not Cover a Number of Significant Impacts, and Bases Many of its Predictions on Faulty Information or Analysis

The NorthMet Supplemental Draft Environmental Impact Statement (SDEIS) omits essential information about the very issues that are most important to Minnesota's citizens, and to informed agency decision-making. Information on mercury discharge to rivers, potential water quality standard violations, and the impacts on water quality if water collection and treatment systems end prematurely, are all missing from the document. In fact, the SDEIS seems to systematically omit any information that might lead a reader to question whether legal standards will be met. These omissions result in an SDEIS that is fatally flawed.

The quintessential purpose behind both the National Environmental Policy Act (NEPA) and the Minnesota Environmental Policy Act (MEPA) is to lead government decision makers to take a "hard look" at the environmental impacts of their decisions before those decisions are made. See *Mid States Coalition for Progress v. Surface Transportation Board*, 345 F.3d 520 (8th Cir. 2003); *Friends of the Boundary Waters Wilderness v. Dombeck*, 164 F.3d 1115, 1128 (8th Cir. 1999); *Citizens Advocating Responsible Development v. Kandiyohi County*, 713 N.W.2d 817, 834 (Minn. 2006). A second but equally important purpose is to inform the public, including politicians, of the impacts of the project, so that an honest, informed public discourse is possible as to whether the project should proceed. See *Robertson v. Methow Valley Citizens*, 490 U.S. 332, 349 (1989); *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 371 (1989). Agencies must therefore "make information on the environmental consequences available to the public, which may then offer its insight to assist the agency's decision-maker through the comment process." *Dubois v. U.S. Dept. of Agriculture*, 102 F.3d 1273, 1285 (1st Cir. 1996). "Because of the importance of NEPA's procedural and informational aspects, if the agency fails to properly circulate the required issues for review by interested parties, then the EIS is insufficient even if the agency's actual decision was informed and well-reasoned." *Id.* at 1287.

NEPA requires that environmental information of high quality be provided to public officials and citizens. 40 C.F.R. § 1500.1(b). "Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA." *Id.* Agencies must therefore "insure the professional integrity, including scientific integrity," of the discussions and analysis in an EIS. 40 C.F.R. § 1502.24. Moreover, an EIS must disclose and respond to "any responsible opposing view." *Id.* § 1502.9(b); see also *Seattle Audubon Society v. Moseley*, 798 F. Supp. 1473, 1479 (W.D. Wa. 1992), *aff'd* *Seattle Audubon Society v. Espy*, 998 F.2d 699 (9th Cir. 1993) ("[a]n EIS that fails to disclose and respond to 'the opinions held by well- respected scientists concerning the hazards of the proposed action ... is fatally deficient.'"); *Earth Island Institute v. U.S. Forest Service*, 442 F.3d 1147, 1172-73 (9th Cir. 2006) (FEIS failed to respond "explicitly and directly" to conflicting views, and agency violated NEPA requirement to take a hard look and provide a full and fair discussion allowing informed public participation and decision-making).

The hard look that NEPA and MEPA require is not possible if the impacts of a project are not clearly stated, are hidden away in background materials, or are discounted in the text. NEPA and MEPA's primary purpose is also thwarted if the discussion of impacts is based on a model that uses inputs that do not reflect reality. The SDEIS uses all these methods to hide the potential impacts of this project from decision makers and the public.

A. *The Hydrogeological Model Used Faulty Assumptions Regarding Baseflow and Hydraulic Conductivity, Making Predictions Based on the Model Unreliable*

Modeling of groundwater movement through the mine site is questionable to the point that the predictions presented in the SDEIS cannot be accepted as accurate. This modeling was used to predict impacts to the water flow in the Partridge River and tributary streams, impacts to groundwater and surface water quality, and estimates of inflow to the mine pits. It will also likely be used to set financial assurance amounts based on the amount of water that will need to be collected, managed, and treated, although the SDEIS provides no information on financial assurance issues.

The primary error in modeling lies in the estimate of baseflow in the Partridge River, which is based on a flow gage seventeen miles downstream of the mine site. While models using data with this degree of uncertainty are sometimes accepted when no other information is available, in this case, enough flow data from further upstream was available to let the agencies know early on that the modeling approach would not accurately reflect the site. The Great Lakes Indian Fish and Wildlife Commission (GLIFWC) pointed this out repeatedly beginning in 2008. *See* SDEIS App. C, Sub. 1.

In September 2008, GLIFWC submitted a memo referring to specific monitoring data "collected in 2004 during 3 periods of low flow . . . at SW-004 and SW-003" and "one measurement at SW-003 in 1978." *Id.* In addition to indicating that the measured flows were an order of magnitude greater than the modeled flows, the memo pointed out that when flow information was available at both SW-005 (the USGS gauge 17 miles downstream) and SW-003 and SW-004 (the modeling and monitoring points closest to the mine site), the data showed a significantly lower flow at SW-005 than at the two upstream locations. As GLIFWC pointed out, "The higher flows in the upper reaches of the Partridge River indicate that the river is gaining in its upper reaches and is losing in its lower reaches." *Id.*

Additional flow information collected since 2008, consistently corroborates the earlier data identified by GLIFWC. *Id.* While the Minnesota Department of Natural Resources (DNR) has recently said that it now has a year's worth of data that supports GLIFWC's position and some adjustment may need to be made (Steve Colvin, personal communication, Jan. 16, 2014), it appears that a year's worth of data from SW-003 was available as early as April 2013. GLIFWC Memo, July 2, 2013, SDEIS App. C, Sub. 1.

PolyMet's explanation of the discrepancy (which the Agencies apparently accepted) was that the additional flow was from discharge from Northshore Mining. However, this does not answer GLIFWC's original observation that the flows at SW-003 and SW-004 were higher than the flows at SW-005. If the river gains water from groundwater in the upper reaches and loses it in the lower reaches, it will do so regardless of whether a portion of the flow is from industrial discharge. PolyMet's approach in modeling groundwater flow was to divide the flow at SW-005 based on the area of the watershed at each modeling point. Clearly this approach does not work for a river that loses flow between upstream and downstream modeling points.

Another reason given by the Agencies' for discounting the measured flow data has been that the available data was not complete enough to use in modeling. But the absence of more accurate data does not justify continuing with a modeling approach that the agencies knew (or should have known) mischaracterized the site.

Because PolyMet calibrated other model parameters to erroneous flow data for the Partridge River, the hydraulic conductivity and recharge values likely significantly underestimate the rate at which groundwater flows through the site. See GLIFWC Memo, March 2, 2012, SDEIS App. C, Sub. 1. This would be particularly true during wet periods, when hydraulic conductivity would have a greater impact on groundwater movement. It is unclear from the SDEIS what values were used for conductivity in the latest iteration of the model, whether the model was re-run using those values, and what the differences were in outcomes. The Agencies must provide an explanation of changes that were made in response to the GLIFWC March 2, 2012 Memo and how those changes are reflected in the modeling and predictions presented in the SDEIS.

The use of data known to be inaccurate for a key modeling parameter does not comply with NEPA, which requires accurate scientific analysis and integrity. 40 C.F.R. §§ 1500.1(b), 1502.24. Furthermore, the Agencies' response to GLIFWC's position does not meet the NEPA requirement that the Agencies consider and respond to "any responsible opposing view," *id.* § 1502.9(b), because that response ignores the underlying issue of the inherent inability of the model's approach to accurately reflect stream flow in a losing stream.

B. The SDEIS Does Not Include Sufficient Information About Mine Pit Inflow and Drawdown of the Partridge River

In addition to the lack of clarity regarding hydraulic conductivity parameters, the SDEIS is unclear as to whether a range of values were used in the model, and if so, the range of possible outcomes on water quantity, both as inflow to the mine and as flow in the Partridge River. As explained above, the predictions as presented for both parameters lack credibility because of the erroneous data used for river base flow; in addition, the absence of a discussion of uncertainty is misleading to decision makers and the public, and violates NEPA. 40 C.F.R. § 1502.22 (describing NEPA's detailed requirements for when relevant information is incomplete or unavailable).

The predicted changes in stream flow at various monitoring points are given in Table 5.2.2-25, and the predicted inflow to the mine pits is given in Table 5.2.2-18. Unlike water quality predictions, there is no discussion of uncertainty and no discussion of the potential range of pit inflow or of stream flow impacts in the accompanying text for either issue. Based on observations elsewhere in the SDEIS, it appears that any impacts affected by the permeability of soils and bedrock at the site are highly uncertain. For example, “the ability of the surficial sediment to transmit water was highly variable and depended upon location and thickness of the sediments. No data were available regarding the storage parameters for the surficial deposits,” SDEIS 4-53; “Hydraulic conductivities between the different deposits range from 0.00026 to 31 ft/day,” SDEIS 5-227.

Indeed, the decision not to use the model to predict groundwater drawdown itself (and the resulting impacts to wetlands) highlights the uncertainty of the mine inflow and stream drawdown predictions. If the model cannot accurately predict the level of groundwater drawdown, how can the impacts on groundwater inputs to the Partridge River or the groundwater inflow to the mine be predicted with any certainty? Yet the SDEIS presents predictions for these parameters as if they were based on solid information.

Adding to the problem in regard to river drawdown, the table showing the predicted drawdown to the Partridge River omits information for SW-003. This is a curious omission that does not seem to be reflected anywhere else in the document. In reviewing groundwater elevation contours found in Figure 4.2.2-5, SDEIS 4-49, it appears that groundwater at SW-003 slopes down-gradient to the east, despite the presence of the river. It thus seems likely that there is very little groundwater input from the east side of the river to balance the loss of groundwater to the East Pit during mining. The statement that “watershed area reductions would approximate flow reductions,” SDEIS 5-117, is overly simplistic. If inflow to the pit draws groundwater away from the river, this will not necessarily mirror the reduction in watershed from mine features on the surface. Furthermore, the surface watershed and groundwater elevations seem particularly disparate just upstream of SW-003. The surface watershed map, Figure 5.2.2-22, SDEIS 5-115, shows a significant watershed area east of the river in this location, while the groundwater elevation map indicates little or no flow to the river from the east. The SDEIS should provide both the modeled drawdown at SW-003, and an explanation of the area used for groundwater inputs to the river and how those inputs correlate with the groundwater elevation contour map.

A review of both the predicted river drawdown and the predicted mine pit inflow is further hindered by a lack of references in the SDEIS text, or possibly the absence of anything other than raw data in the record to provide further explanation. The citation for stream flow drawdown is to a memo that apparently accompanied the raw modeling data, see Table 5.2.2-25, SDEIS 5-118, and Barr 2012g, while the discussion of mine pit inflow does not provide a citation at all, see SDEIS 5-90. Significant drawdown of the Partridge River would be a significant environmental impact pursuant to NEPA and

MEPA, and the inability to review the conclusions in the SDEIS is a significant flaw in the document.

Similarly, the amount of water inflow to the mine will have many consequences for water management, treatment, and transport, particularly with a mine plan that involves moving water back and forth between the Mine Site and the Plant Site. Because all surface discharges are planned to occur at the Tailings Basin during the life of the mine, the amount of inflow has significant implications for the Water Collection System and the amount of contaminated water escaping capture at the Tailings Basin. The amount of inflow is also likely to impact the amount of financial assurance that will be required.

In sum, to comply with NEPA and MEPA, the SDEIS must be substantially supplemented and revised to provide information as to the certainty of predictions regarding mine pit inflow and Partridge River drawdown and the range of various model inputs that was used to obtain them. Without this information, informed review by the public and decision makers is not possible.

C. The Water Quality Modeling and Assessment Ignores or Mischaracterizes Many Potential Impacts

As with most of other issues, the SDEIS downplays the impacts of the Proposed Project on water quality. The location of evaluation points, assumptions regarding the effectiveness of collection systems, and the mischaracterization of “fault” for predicted exceedances of water quality are only a few of the ways that predicted impacts are minimized. The following points are not exclusive; time did not permit an exhaustive list of the misstatements and questionable methods used to dismiss impacts on water quality. The discussion here focuses on impacts to rivers and streams; water quality impacts to wetlands are discussed below in the wetland section.

1. The SDEIS Does Not Assess Water Quality Impacts to the Partridge River Along a Three-Mile Stretch Upstream of Monitoring Point SW-004

According to the SDEIS Executive Summary (with two exceptions that are dismissed as irrelevant) wastewater releases from the NorthMet Project “would not cause or increase the magnitude of an exceedance of the groundwater and surface water evaluation criteria at the P90 level for any of 28 solutes at 29 evaluation locations.” SDEIS ES-35. Variations on this statement are made throughout the SDEIS. What this statement does not reveal is that the “29 evaluation locations” are placed in such a way that they do not assess some of the areas that are most likely to be impacted by the project. One of these areas is a three-mile (or longer) stretch of the Partridge River that is likely to receive discharges above water quality standards.

Figure 5.2.2-4 of the SDEIS shows the predicted paths that polluted water leaching into the ground from stockpiles and pits will take as it migrates to the Partridge River. Water quality monitoring point SW-003 is located just upstream of the area where

polluted water from the Category 2/3 Stockpile and the East Pit is presumed to enter the Partridge River. The first “evaluation location” below SW-003 and the Category 2/3 Stockpile and East Pit flowpaths (SW-004) is located more than three miles downstream. As explained above, this stretch is unlikely to have a significant inflow of clean groundwater from east of the river, because the groundwater elevation drops moving east from the river. See Figure 4.2.2-5, SDEIS 4-49. Furthermore, Stubble Creek (which is presumed not to be impacted by the mine) enters the creek toward the end of this stretch, which would dilute upstream pollutant concentrations prior to monitoring. Thus both the modeling and the monitoring of water quality at SW-004 are unlikely to reflect the water quality of the stretch of the river most impacted by the Category 2/3 Stockpile and East Pit.

Information on the quality of the groundwater entering the Partridge River over this three-mile stretch is found in Table 5.2.2-22, SDEIS 5-109. Unfortunately, the table includes only the “Groundwater Evaluation Criterion” and does not reveal the surface water quality standards that actually apply at this point. Despite the clear availability of this information, nothing in the text reveals the fact that discharge to the Partridge River through the East Pit/Category 2/3 Flowpath at the P90 level is predicted to violate water quality standards for both aluminum and cobalt. The aluminum standard is 125 ug/L; Table 5.2.2-22 indicates that at the P90 level, aluminum levels will be as high as 177 ug/L. The cobalt standard is 5.0 ug/L; the P90 predicted maximum cobalt level is 7.6 ug/L.

In addition, the SDEIS should disclose that at the P90 level, groundwater in the West Pit flowpath is predicted to violate the surface water quality standard for cobalt (by a factor of 5) and lead at the point of discharge to the river. See *id.* Although the predicted average discharge from the WWTF would add significant dilution capacity at that point, it is unclear what the discharge regime will be in order to protect seasonal variation in the river flow. Furthermore, as discussed below it is highly unlikely that mechanical treatment will continue until the point when groundwater outflow from the West Pit meets surface water quality standards.

These P90 predicted concentration levels are not short-term exceedances. Figure 6-126 of the Water Modeling Data Package Vol. 1 (PolyMet Mining 2013i) indicates that the aluminum exceedance in the East Pit flow path would extend over a period of roughly 40 years. A figure that was included in the May 2013 internal review draft (Fig. 5.2.2-19 on page 5-89) (Ex. 16) but does not appear in the final SDEIS indicates that the cobalt exceedance would extend over a period of almost 100 years.¹

Furthermore, it seems likely that SDEIS Table 5.2.2-22 under-predicts the level of contaminants in the East Pit flowpath at the earliest point of discharge to the river. Some of the available figures and tables assess the quality of groundwater at the property

¹ In the official draft of the SDEIS released to the public, this figure has been replaced by a P50 figure, which does not show a predicted exceedance.

boundary, and some assess the quality at the point of discharge to the Partridge River. In SDEIS Figure 5.2.2-4, it appears that the property boundary coincides with the Partridge River at the point of the blue dot just below SW-003 (“the groundwater evaluation location”). The modeling apparently assumed that SW-003 would not be impacted by polluted groundwater, but that the point just below it would. For the purpose of this discussion, the accuracy of this assumption is not important,² the point being that SW-003 represents an unimpacted location and the groundwater evaluation location below it represents a location impacted by the East Pit/Category 2/3 Flowpath. The importance of this groundwater evaluation location lies in the fact that this is the closest downgradient point that the property line comes to any of the sources of contamination, and thus this is an important point at which to assess potential water quality impacts.

What is unclear is why this point is not also used to assess *surface* water quality impacts, as the property line and the Partridge River meet at this point. The SDEIS does not clearly reveal where the solute concentrations shown in Table 5.2.2-22 would occur. However, Table 5.2.2-8 lists the various groundwater flow paths and the distance to where they meet the property line and the Partridge River, and Figure 5.2.2-4 indicates points of discharge of groundwater to the Partridge River and groundwater evaluation locations. According to Table 5.2.2-8, the distance to the property boundary from the Category 2/3 Stockpile is 140 meters, while the distance to the Partridge River is 955 meters. Yet the river is located at the only “groundwater evaluation location” shown on Figure 5.2.2-4.

There seems to be very little information available on water quality at the property boundary for the East Pit flow path. Graphs of the solutes most likely to violate surface water quality standards are not included in the Water Modeling Data Package for this location. However, the Water Modeling Data Package does include a graph for sulfate, Figure 6-69, PolyMet 2013i at 209. The maximum P90 sulfate level at the property boundary is shown as approximately 29 mg/L, while Table 5.2.2-22 shows the sulfate level at the river as 21.6 mg/L. But according to the map, the closest point to the property boundary and the river are the same. It thus appears that the scant information that does exist regarding water quality discharge to the Partridge River from the East Pit Flowpath significantly understates contaminant levels by overstating the distance the contaminated water will travel before it arrives at the river.

In regard to copper, Large Figure 47 from the Water Modeling Data Package Vol. 1 (PolyMet 2013i) indicates that levels will range around 5 ug/L at the property boundary, while Table 5.2.2-22 gives a concentration figure of 3.4 ug/L for discharge to the river. Once again, because the closest distance to the property boundary and to the river is the same, it seems that Table 5.2.2-22 likely understates the level of copper discharging to the river. We believe this could be significant in assessing the impact on surface water quality from copper. The standard is hardness-dependent, and the text of the SDEIS consistently uses a hardness of 100 mg/L to assess compliance with the standards. But the average hardness of the Partridge River throughout the mining area is

² It is important for other reasons, however, which are discussed below.

less than 100 mg/L, with a range that begins as low as 16.9. Table 4.2.2-14, SDEIS 4-77. Baseline hardness as measured in the South Branch of the Partridge River is 37 mg/L. Table 4.2.2-13, SDEIS 4-76. Based on these figures, we believe that the copper standard may be exceeded in addition to the aluminum and cobalt standards.

According to the Water Modeling Data Package, the Minnesota Pollution Control Agency has stated that water quality standards must be met at the “end of pipe,” before mixing with surface water. PolyMet 2013i at 7. This is the appropriate point for compliance for groundwater discharges as well, as the impact at the point of discharge is the same. If contaminants traveling through groundwater contribute to pollution of surface water, EPA and federal courts require a NPDES permit for the discharge. The EPA has stated that “the Agency interprets the Clean Water Act to apply to discharges of pollutants from a point source via ground water that has a direct hydrologic connection to surface water.” 66 Fed. Reg. 2960, 3015, Jan. 12, 2001. Federal courts that have addressed the issue have agreed with this interpretation. Following an extensive review of the case law, one court concluded, “The logic of these cases is compelling: since the goal of the CWA is to protect the quality of surface waters, any pollutant which enters such waters, whether directly or through groundwater, is subject to regulation by NPDES permit.” *Washington Wilderness Coalition v. Hecla Min. Co.*, 870 F. 2d 983, 990 (E.D. Wash. 1994). The Minnesota Pollution Control Agency reviews and permits discharges directly to surface water and indirectly through groundwater in one integrated process, recognizing that pollutants are equally harmful regardless of the path they take to surface water.

2. The Discussion of Aluminum and Lead Exceedances in the Embarrass River is Misleading and Incomplete

Under NEPA, an EIS must explain how a proposed action will or will not comply with other environmental laws and policies. 40 C.F.R. § 1502.2(d); *see also* 40 C.F.R. § 1502.16(c). The SDEIS discloses that water quality standards for both aluminum and lead are likely to be exceeded in the Embarrass River and its tributaries, but concludes that neither exceedance will be due to pollutants from the proposed NorthMet Project. According to the SDEIS, the aluminum exceedance would result from the use of water from Colby Lake (which already exceeds the standard for aluminum) to augment flows. In the case of lead, SDEIS claims that the exceedance would result from relatively high natural levels of lead in surface runoff when combined with the discharge from the Waste Water Treatment Plant. The SDEIS provides virtually no other discussion of impacts, apparently assuming that both situations will comply with legal requirements and giving only the most cursory mention of impacts on the aquatic system that the water quality standards protect. *See* SDEIS 5-379. In both cases, the SDEIS appears to misinterpret the Clean Water Act, fails to consider the Minnesota Environmental Rights Act, and fails to consider and disclose the impacts of aluminum and lead on aquatic organisms as required by NEPA and MEPA.

a. The Aluminum Exceedance Would Violate the Clean Water Act

Pursuant to the Clean Water Act, discharges to surface waters that have the potential to result in water quality standard violations are limited by water quality- based effluent limits. *See* 40 C.F.R. § 122.44(d). These limits must be set at a level that ensures that the discharge will not cause *or contribute* to a violation of water quality standards. *Id.* A discharge may contribute to the violation of a water quality standard even if the level of the pollutant in that water does not in-and-of-itself exceed the water quality standard. For instance, if a facility adds to the total load of the pollutant in a stream without increasing the amount of water in the stream, that addition will contribute to the water quality standard violation.

This is best understood in the case of tributary streams. To illustrate, say the main stream of a river currently contains 135 ug/L aluminum, exceeding the standard of 125. Tributary A contains 20 ug/L aluminum, which dilutes the main stream where the tributary enters so that it is no longer above the standard – perhaps at this point, the stream has an aluminum level of 120 mg/L. A facility discharges water with an aluminum level of 60 ug/L to tributary A, bringing the level in Tributary A up to 40 ug/L. Tributary A no longer provides the same level of dilution to the main stream, and now the main stream below the mouth of Tributary A has an aluminum level of 130 ug/L, exceeding the standard. The facility’s discharge has caused or contributed to a water quality standard violation even though its discharge is itself below the standard.

This would essentially be the situation with aluminum from the proposed NorthMet project during the time when water from Colby Lake is used to augment flow in Embarrass River tributaries. Despite the obfuscation of the SDEIS, the NorthMet project as proposed will, in fact, contribute aluminum to groundwater flows to the Embarrass River tributaries during the time that Colby Lake water is used to augment flows. *See* Water Modeling Data Package Vol. 2 (PolyMet 2013j). While this addition of aluminum may be small, and may even be less than the amount of aluminum that would have been added to groundwater under the continuation of existing conditions, aluminum from the NorthMet project will add to aluminum in downstream waters, thus contributing to the violation of the water quality standard.

b. The Lead Exceedance Would Violate the Clean Water Act.

The SDEIS discussion of lead exceedances in Embarrass River tributary streams appears to be downright dishonest. *See* SDEIS 5-192. The discussion lists the various sources of water to the tributaries; in regard to seepage from the tailings basin, it states only that most of the seepage would be collected and treated. The discussion concludes that background surface runoff would be the “primary” cause of exceedances.

What the SDEIS does not reveal is that natural runoff has a lead concentration below 0.6 ng/L ninety percent of the time, Water Modeling Data Package Vol. 2, Fig. 6-108, while contaminated groundwater at the first evaluation point that includes discharge

to surface water has a predicted lead concentration of up to 2.5 ug/L *id.*, Fig. 6-69. The SDEIS does not tell us what the quality of the WWTP discharge will be, but apparently PolyMet expects to be allowed to discharge at the water quality standard based on the hardness of its discharge, *see id.* Table 5-17, i.e., 3.0 ug/L.

Furthermore, the statement that lead in surface runoff shows a ten percent chance of exceeding the standard at any given time appears to be incorrect; Water Modeling Data Package Vol. 1 Figure 6-108 shows an exceedance probability of about five percent. If this was a discussion of lead levels in water from the NorthMet project, this five percent probability would be eliminated from discussion as being above the P90 probability level. If one hundred percent of modeled exceedances for natural runoff are included in the analysis, one hundred percent of the modeled exceedances for the Proposed Project should also be included.

In any event, the highest lead concentration shown for natural runoff is 1.8 ug/L, at an approximately 99% probability level. *Id.* Fig. 6-108. This is significantly below the presumed level of the WWTP discharge and the maximum predicted lead levels in Embarrass River tributary creeks, which range as high as 3 ug/L. Table 5.2.2-32, SDEIS 5-183. In comparison, the highest predicted lead concentration in the creeks under the “continuation of existing conditions” scenario is 1.3 ug/L. The gist of the whole situation appears to be that PolyMet will discharge lead at a level just below the standard based on the hardness of its discharge, and that natural conditions will reduce the hardness of the water to the point where the lead exceeds the water quality standard. Blaming that scenario on natural runoff is disingenuous in the extreme.

Under the Clean Water Act, the application of hardness-dependent water quality standards is based on the receiving water, and downstream standards must be met even where the hardness of the water varies. If downstream waters have a lower hardness level and thus a lower standard, pollutants in the discharge must be reduced to the point where they will meet the lower standard.

**c. Aluminum and Lead Exceedances are Significant
Environmental Impacts and Would Violate the Minnesota
Environmental Rights Act**

Aside from Clean Water Act requirements and regulations, the fact of the matter is that PolyMet’s proposed action would result in the violation of water quality standards. PolyMet would create the situation where makeup water from Colby Lake is required, and would transport and release that water to the tributaries. PolyMet would discharge lead at a level that would result in water quality standard exceedances where it mixes with water in the environment. In both cases, the exceedance would result from PolyMet’s actions.

The Minnesota Environmental Rights Act (MERA) defines “pollution, impairment, or destruction” as “*any conduct* by any person which violates, or is likely to violate, any environmental quality standard . . .” Minn. Stat. §116B.02(5). MERA goes

on to delineate a number of ways in which any citizen may take legal or administrative action to prevent the pollution, impairment, or destruction of natural resources. See Minn. Stat. §116B.03, .09, and .10. The Minnesota Environmental Policy Act precludes the DNR and Minnesota Pollution Control Agency (MPCA) from issuing permits that would result in the pollution, impairment, or destruction of natural resources. Minn. Stat. § 116D.04(6). Neither statute is limited to situations where the proposed activity violates some other environmental protection statute or regulation. Thus regardless of whether the predicted exceedances are deemed compliant with the Clean Water Act, they do not comply with Minnesota law.

d. The SDEIS Fails to Adequately Consider the Impacts of Aluminum and Lead Exceedances on Aquatic Organisms

The water quality standards in this case are designed to protect aquatic organisms, and exceedances of those standards indicate a significant impact on the aquatic community. The Embarrass River is listed as impaired for Fishes Bioassessments. The causes have not yet been determined, and a TMDL has not yet been prepared. Until those things occur, any increase in pollution that might contribute to the impairment cannot be permitted. The SDEIS provides no information about the impact of aluminum on aquatic organisms, and in regard to lead says only that “Effects on aquatic biota from the lead exceedance due to changes in hardness are not well-understood, but would likely increase the potential to adversely affect aquatic life.” SDEIS 5-380. To comply with NEPA and MEPA, the SDEIS must provide substantially more information on the likely impacts of aluminum and lead exceedances on the aquatic community.

3. The Evaluation Points for Groundwater Discharge to Surface Water From the Tailings Basin Are Downstream of the Closest Impacts

Most of the area immediately below the Tailings Basin consists of wetlands. SDEIS Fig. 4.2.3-1. Satellite images reveal that the area includes a number of small ponds of open water. Google Earth Tailings Basin images (Sept. 4, 2013) (Ex. 17). Unnamed Creek begins at the Northwest Toe of the Tailings Basin, as shown on the SDEIS figures and as clearly apparent on satellite imagery. Both the figures and satellite imagery show Trimble Creek beginning a good distance south of the transmission line that crosses the area. Mud Lake Creek can be traced on satellite imagery all the way to the northeast corner of the Tailings Basin, an area dotted by ponds of open water. On the DNR’s Public Waters map, Unnamed Creek is designated as a Public Water beginning at the section line, immediately below the Tailings Basin Dam. Trimble Creek is shown as originating in the Spring Mine Lake area and flowing through the area that is now the Tailings Basin, although it is not designated as a Public Water until approximately 1,000 feet upstream from the transmission line. DNR, Protected Waters and Wetlands, St. Louis County, Minnesota Sheet 4 of 7 (1985) (Ex. 18).

The SDEIS fails to assess the impacts on any of these tributary streams at the point where the water collection system, discharge water, and groundwater seeping from the Tailings Basin will first impact them. Water quality evaluation points are shown on

Figure 5.2.2-6. This figure indicates that the closest evaluation point for Mud Lake Creek is at the PolyMet property line; the closest evaluation point for Trimble Creek is at the transmission line; and the closest evaluation point for Unnamed Creek is at the property line. All of these points are significantly downstream of the point where the Tailings Basin currently impacts them (i.e., at their headwaters).

PolyMet plans to collect most of the seepage and treat it before releasing it to augment flows, but even if things go according to plan and the groundwater seepage feeding headwaters is significantly reduced, the estimates of the distances to where groundwater will first release to surface water seem vastly overstated. These distances are provided in SDEIS Table 5.2.2-11, which indicates that this distance for Unnamed Creek is 5,331 meters, for Trimble Creek is 3,645 meters, and for Mud Lake Creek is 3,191 meters. This translates to 3.3 miles, 2.3 miles, and 2 miles, respectively. Unfortunately this table is limited to deterministic and P50 data, and the SDEIS does not reveal how the information relates to the P90 water quality predictions shown on Table 5.2.2-42. However, it appears from Figure 5-29 of the Water Modeling Data Package Vol. 2 that pollutants in the groundwater that would escape collection were not factored into the water quality predictions until evaluation points MLC-2, PM-19, and PM-13, for the North, Northwest, and West flowpaths respectively. These evaluation points appear to coincide with the distances given in Table 5.2.2-11.

Similar to the discussion of Partridge River drawdown and inflow to the Mine Pits, the discussion on groundwater travel distances at the Plant Site does not disclose whether a range of values were used in modeling this critical parameter, nor what those values were. The SDEIS must explain what parameters and variables were used to obtain the predictions shown on Table 5.2.2-42, including the point or range of points at which contaminated groundwater is first presumed to release to surface water. See 40 C.F.R. § 1502.24 (agencies must identify any methodologies used in an EIS).

Furthermore, the SDEIS needs to reveal the reasoning behind the use of these numbers. The apparent idea seems to be that any water escaping the collection system would escape at the bottom of the barrier, and would move a significant distance before emerging at the surface. However, the SDEIS does not actually say this, or explain the barrier system sufficiently to support the hypothesis. Figure 3.2-28 shows a “Cutoff Wall,” and the text directs the reader to the description of the Cutoff Wall for the Category 1 Waste Rock Stockpile, which it describes as “similar.” In both places, details are scant as to what the wall will be made of; how it will be constructed; what the target permeability means in regards to leakage; how likely it is that PolyMet will achieve the target permeability at all locations of a four-mile, underground wall; and whether occasional breaches in the wall due to construction methods and materials may allow for significant escape of groundwater at locations that cannot be identified before they occur. Furthermore, neither discussion provides any citation to reference materials. Minnesota Center for Environmental Advocacy, Friends of the Boundary Waters Wilderness, and Water Legacy are submitting comments regarding the construction and efficacy of the cutoff wall and collection system, which are incorporated herein.

The best that can be said of the SDEIS on this entire issue is that any conclusions regarding water quality that are based on significant travel distance of contaminated groundwater before discharge to surface water are unsubstantiated. See 40 C.F.R. § 1502.24 (agencies must insure the scientific integrity of the analysis in an EIS, and “shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions”). It seems likely, however, that these travel distances are significantly overestimated. According to the SDEIS, the release of treated water and natural recharge would “maintain hydrology within 20 percent of existing conditions” (allegedly a difference that would be insignificant in terms of impacts) and “maintain saturation in the surficial (unconsolidated) unit.” SDEIS 5-159. Given the current conditions of completely saturated soils and standing water immediately below the basin, and these statements from the SDEIS, it seems likely that groundwater escaping the Collection System will discharge into fully saturated conditions, where it is likely to mix with water discharged to the surface in close proximity down-gradient of the Tailings Basin.

Groundwater at the toe of the Tailings Basin is predicted to be quite polluted. According the Water Modeling Data Package Vol. 2 (PolyMet 2013j), P90 concentrations at the North Toe are predicted to be approximately 500 mg/L sulfate and 50 to 60 ug/L lead, Figures 6-24 and 6-35; at the Northwest Toe, 700 mg/L sulfate and up to 34 ug/L cobalt, Figures 6-38 and 6-39; and at the West Toe, 500 mg/L sulfate and up to 180 ug/L copper, Figures 6-42 and 6-45.³ In comparison, the surface water quality standards for water with a hardness of 100 mg/L are 3.2 ug/L for lead, 5.0 ug/L for cobalt, and 9.3 ug/L for copper. As for sulfate, although the 10 mg/L standard to protect wild rice is not being applied at this location, this sulfate is likely to be discharged to wetlands at a level that seems very likely to affect the methylation of mercury and resultant level of mercury in fish tissue. The SDEIS needs to clarify the range of distances to where this water is predicted to mix with surface water, and provide adequate explanation to support that range of distances. These issues are addressed further in the section on wetland water quality impacts below.

Furthermore, regardless of the amount of groundwater that will reach the surface at this location, the impact of the project on the streams immediately below the Tailings Basin must be disclosed in the SDEIS. All of these streams currently and historically began at or within the Tailings Basin, and thus the assessment of impacts must begin at the Tailings Basin. All surface water evaluation points presented in the SDEIS are located at or beyond the property line, which begs the question of how these points were chosen. Minnesota’s surface waters must be protected regardless of their location on private property.

These headwater streams would all be highly impacted by the NorthMet project. Even if polluted groundwater discharge does not affect them until further downstream,

³ The Water Modeling Data Package includes figures for only a few of the constituents, which are listed here as examples. The predicted levels of all constituents in groundwater at the base of the Tailings Basin should be included in the SDEIS.

their primary source of flow will be WWTP discharge. While this discharge will apparently meet surface water quality standards, it may barely do so for some pollutants. See Water Modeling Data Package Vol. 2 Table 5-17 (PolyMet 2013j). For pollutants that are based on hardness, this discharge may meet the standard at the point of discharge but fail to do so once the hardness is diluted by rainwater and natural groundwater. This appears to be the situation for lead; because no analysis of the headwaters was done, no conclusion can be drawn regarding copper, which is also of concern.

The Proposed Project will also have a significant impact on water quantity in the headwater streams. The proposal to augment water appears to be based on measured flow at the first evaluation locations (again, located roughly at the property boundary). See SDEIS Table 5.2.2-39. Once again, the document lacks clarity regarding the amount of water to be discharged, listing minimum requirements and maximum allowances, but providing no discussion of the degree to which the amount of water discharged is expected to maintain the hydrology of wetlands and streams immediately below the discharge point. See SDEIS Tables 5.2.2-40 and 5.2.2-41. Will the minimum required augmentation shown on Table 5.2.2-41 be increased if wetlands and stream flow disappear within the PolyMet property, or will an increase not be required until the flow at MCL-3, TC-1, or PM-11 drops below 80% of its historic flow? And will that 80% be measured in accordance with historic seasonal variation, or will it be based on average or low flow conditions regardless of the season? The SDEIS provides no answers to these questions.

Finally, the SDEIS provides virtually no information on planned monitoring points. As discussed below, apparently no monitoring is planned for the tributary streams. The SDEIS must provide a plan for monitoring water quality and aquatic biota as well as flow in the Embarrass River tributaries, beginning at their historic sources.

4. The SDEIS Fails to Disclose Impacts on Water Quality From Deposition of Air Emissions

Although the SDEIS mentions air deposition as a potential source of metals and sulfur inputs to wetlands, the discussion provides no information about the *amount* of deposition other than a line delineating the boundary of the area within which deposition will be greater than 100% of background levels. The SDEIS provides no assessment of the impacts on water quality from the predicted amount of deposition. The discussion of this issue does not amount to the “hard look” required by NEPA and MEPA for a number of reasons.

First, the SDEIS does not provide information on the amount of sulfur or metals that will be deposited within the “greater than 100% of background levels” line. See Figure 5.2.3-17, SDEIS 5-281, and Figure 5.2.3-23, SDEIS 5-306. The entire exercise begs the question: how much greater than 100% of background levels? An average reader might assume from the discussion that within this area, there would be twice the amount of deposition as background level. But this is nowhere near the reality.

Isopleth maps for copper and nickel deposition based on modeling to assess deposition from the Eagle Mine in Michigan's Upper Peninsula are provided as Conestoga-Rovers (2008) (Ex. 19). According to the background deposition information from the Wetlands Data Package, PolyMet 2013b, "100% of background level" would be between the lines marked "3" and "4" on the Eagle Mine copper map. Within this space, the copper level rises quickly and dramatically, with a level as high as 35 mg/m³ in the center, which is 1,000% of background level. The type of information is crucial to an understanding of impacts, and must be provided in the NorthMet SDEIS.

Second, the rationale for using 100% of background level as a cutoff for impacts relates only to designing a monitoring plan. No scientifically valid support whatsoever is given for the assertion that there will be no impacts in areas where deposition is increased by less than 100% of background levels. Whatever its validity as a rough cut-off for monitoring, in regard to impacts this number is clearly arbitrary. Rather than providing a justification for using this cut-off, PolyMet needs to provide an explanation of the impacts on water quality at this level of deposition, and a discussion of why areas with less deposition will neither experience impacts themselves nor contribute to impacts downstream.

Third, neither the SDEIS nor the Wetlands Data Package provides information regarding specific metals. This speciation work was apparently included in the modeling:

Dust deposition rates were speciated for the following metals: arsenic, cadmium, chromium, lead, manganese, nickel, and selenium (Attachment A). Copper and vanadium were added to the evaluation because background deposition estimates were provided in Reference (19). Attachment C provides the chemical composition of ore, waste rock and tailings used in the dust speciation. The maximum concentration for each metal and sulfur was used in the speciation calculations.

For both the Mine Site and the FTB, for each receptor node, the post-processing of the dust deposition rate by source contribution was then summed to provide a "total" metal deposition rate and a "total" sulfur deposition rate.

Wetlands Data Package, PolyMet 2013b at 33. However, information regarding specific metals and sulfur was deliberately left out of the report:

The model results for the individual metals and sulfur are not presented here, only the maximum area having the potential for effects from one or more of the dust constituents.

Id. at 37. In short, there appears to be no information in the record on the deposition of specific metals or of sulfur, despite the clear indication that this information exists.⁴ The

⁴ It is unclear whether the "100% deposition line" refers only to total metal, or if it also includes all areas where a specific metal deposition will be greater than 100%. Also,

absence of this information makes any judgment of the contribution of air deposition to violations of water quality standards impossible, as those standards are all for specific constituents.

The SDEIS must provide information on the deposition of specific metals and sulfur, especially those that are expected to be emitted in large amounts and/or to present a water quality problem due to other source pathways. The former includes copper, nickel, manganese, and sulfur. The latter includes these plus cadmium, cobalt, lead and zinc. Apparently neither cobalt nor zinc were included in the speciation assessment, yet they are present at higher levels in the emissions than some of the other metals that were included. See Air Data Package, PolyMet 2013o Att. J. They are also metals that can be expected to enter wetlands and streams through groundwater at levels above the applicable surface water quality standards, and thus information on contributions from air deposition is crucial to an assessment of water quality impacts.

Fourth, the SDEIS makes no predictions about the impacts of air deposition of either metals or sulfur on water quality. The entire point of the exercise is to assess whether this source of metals and sulfur to the environment will result in levels of metals or sulfur in wetlands that would contribute to water quality standard violations or otherwise contribute to environmental effects (such as increased mercury methylation, degradation of high quality waters, or toxicity to aquatic life or wildlife due to metals for which there are no numeric standards). The SDEIS fails to say anything about potential impacts, and the Wetlands Data Package specifically states that the modeling does not predict impacts, but is limited to a screening assessment for the purposes of monitoring. PolyMet 2013b at 38 (“The deposition modeling results for dust, metals and sulfur do not indicate or suggest a degree of impact”). While we support monitoring to assess the impacts of air deposition should this project go forward, the promise of monitoring cannot be used to circumvent the requirement that impacts be assessed *before* the project is approved.

Fifth, the SDEIS does not even mention the potential for contributions to water quality impacts in the Partridge and Embarrass Rivers and tributary streams from air deposition. It is unclear why the discussion focused only on wetlands. SDEIS Figure 5.2.3-17 indicates that the “100% deposition line” will overlap the Partridge River in one location (to the east of the Category 2/3 Stockpile) and will overlap a significant amount of riparian wetlands in another (south of the Rail Transfer Hopper). Furthermore, some amount of metals and sulfur deposited on land will make its way to the rivers.

The “100% deposition line” at the Plant Site covers an area of several square miles. SDEIS Figure 5.2.3-23. The area overlaps the headwaters of Second Creek. The statement that “No potential indirect wetland effects from fugitive dust to Second Creek would occur,” SDEIS 5-302, is misleading, primarily because the discussion does not clearly separate impacts due to dust from impacts due to metals. The statement thus leads

the figures are labeled “Estimated Metal Deposition,” making it unclear whether the delineated areas also include all areas with 100% of background sulfur deposition levels.

the reader to believe that there will be no impacts from air deposition on Second Creek. However, the SDEIS cites PolyMet 2013k, which states that metals deposition could have an impact on Second Creek (as opposed to dust, which according to this document, would not).

SDEIS Figure 5.2.3-23, which pertains to metals, indicates that there *would* be effects on Second Creek. Furthermore, it appears from Figure 5.2.3-22 that there could be significant impacts from dust on Spring Mine Creek. Finally, we reiterate that the cutoff of 100% of background for considering impacts is arbitrary and has no scientific support. It is entirely possible that inputs – particularly direct inputs – to the rivers will impact water quality even if the additional deposition is less than 100% of background.

The SDEIS provides voluminous information on water quality, much of it relating to sources that will contribute smaller amounts of metal and sulfur to the aquatic environment than air emissions will. The SDEIS needs to include air emissions and fugitive dust sources in its assessment of impacts to water quality.

The very scant information that is provided in the SDEIS indicates that air deposition could be a significant source of water quality degradation. For example, the discussion of Hazardous Air Pollutants (HAP) indicates that large amounts of metals will be emitted at both the Plant and Mine sites. See Table 5.2.7-6, SDEIS 5-404 (controlled nickel emissions of 6 tons per year; controlled total HAP emissions of 17 tons per year). It is unclear what “controlled” means in this case, i.e., whether this includes fugitive dust emissions. If it does not, the emission rate would presumably be much higher, but, in any event, 6 tons is quite a lot of nickel. Furthermore, we assume that copper, which would be emitted at one of the highest levels of any of the metals, is not included in these figures, as it is not a listed HAP. See 42 U.S.C. 7412(b)(1). Finally, we note that the portion of metal that is from fugitive dust will virtually all be deposited locally. The obvious question is, how much of this metal will end up in the Partridge and Embarrass Rivers? This is a question that the SDEIS does not ask, much less answer.

Regarding sulfur, in the context of Class I areas the SDEIS states, “The National Park service has established a Deposition Analysis Threshold of 0.01 kilograms per hectare per year for both sulfur and nitrogen deposition for class I areas. The DAT is a level below which adverse effects from a new or modified source are not anticipated and are considered insignificant.” SDEIS 5-417. We understand that this is essentially a screening standard for Class I areas, with no legal effect at the Mine Site. However, it also indicates a level at which an increase in sulfur deposition can be considered not to be a problem for an ecosystem. In other words, while this level of deposition may not be relevant to permitting, it is relevant to environmental review. If vegetation, soils, and water could be impacted at a particular level of deposition in a National Park, they could be impacted by the same level in other high quality ecosystems.

The SDEIS does not say what the sulfur deposition level will be at any location outside of Class I areas. In fact, it discusses only the increase in metals, and tells us nothing about sulfur. See SDEIS 5-276. (“There are 234 acres of wetland

potentially indirectly impacted (modeled metal deposition greater than 100% of background”). It is unclear whether this means that sulfur deposition would not increase by 100% at any location, or whether the area of 100% sulfur deposition is simply not disclosed. However, if the increase would be 100% or more on some undisclosed amount of acreage, that would amount to an increase of 1.6 kilograms per hectare (0.16 g/m³ per year). See SDEIS 5-274. To state the obvious, this is 100 times the level at which impacts might be seen in a National Park. It thus seems untrue that deposition at the modeled level “would likely not have an adverse effect on wetlands,” SDEIS 5-276, another statement that is made without scientific support.

A fair amount of investigation has been conducted in the last two decades regarding the contribution of air emissions to water pollution, with much of it concluding that air deposition of metals can be a significant contributor to elevated levels in surface water. A proposal to expand the NAPD mercury monitoring program to include several other trace metals was presented in April 2013. Brunette, Robert C., Patrick Garcia-Strickland, Gerard Van der Jagt, and Jason Karlstrom “Addition of a Suite Of Metals as Official Analytes for the National Atmospheric Deposition Program (NADP),” April 23, 2013 (Ex. 20). The proposal quotes extensively from a 2001 white paper by Clyde Sweet⁵ making a similar proposal. Sweet made the point that background levels for many metals can be problematic:

Many of the trace metals cause human health problems if the levels ingested are too high. Mercury is of particular concern because it is bioconcentrated in fish by a factor of 10⁶ or more, so that consumption of contaminated fish can result in significant human exposure. Other trace metals are not bioconcentrated as much as Hg, but some can accumulate in fish and shellfish under certain circumstances. Consumption of drinking water and/or aquatic organisms may result in harmful human exposures to some trace metals. Trace metals from atmospheric deposition can also accumulate in surface waters and soils where they may cause harmful effects to aquatic life or forest ecosystems. The U.S. EPA (1999) has published “critical maximum concentration” (CMC) water quality criteria for several trace metals that are priority pollutants. CMCs have been established both to protect human health based on direct consumption of water and aquatic organisms and to protect freshwater and saltwater ecosystems. To assess the potential of a particular trace metal to cause toxic effects, CMCs can be compared with the highest concentrations of that trace metal found in atmospheric deposition. Using this approach based on 1976 standards and concentrations, Galloway *et al.* (1982) identified 3 trace metals with potential effects in drinking water (Hg, Pb, Mn) and 7 trace metals with potential effects on aquatic organisms (Cd, Cr, Cu, Hg, Ni, Pb, Zn). If this analysis is done using 1999 standards and 1990’s concentration data from the Great Lakes region (Sweet and Harlin, 1997), maximum concentrations of Hg, As, and Pb in rain exceed the drinking water standards, and maximum concentrations of Cd, Cu, Hg, and Zn in rain exceed the

⁵ Sweet also authored the paper from which the background air concentrations for metals was taken for the SDEIS. See Sweet et al. 1997.

CMCs for environmental effects. Sweet, C., Prestbo, E., White Paper, 2001
“Monitoring Trace Metals in NAPD.”

Id.

Table 4.2.2-14 of the SDEIS, which presents existing water quality data in the Partridge River, indicates occasional exceedances of water quality standards for aluminum, cobalt, and lead. Other metals have individual data points that are significantly elevated above the mean, including arsenic, copper, manganese, selenium, and zinc. Currently we have no information on whether occasional exceedances or elevated levels may be due to atmospheric deposition, although as explained below, we do know that storm events result in elevated concentrations of mercury in Northern Minnesota streams. In any event, the available information does not indicate that deposition of metals – or sulfur -- can be dismissed as insignificant for the Partridge and Embarrass Rivers.

5. The SDEIS Must Disclose the Predicted Quality of Ground and Surface Water Within and Under the PolyMet Property

The SDEIS evaluates impacts to groundwater at the property boundary in several locations at both the Mine Site and the Plant Site. It does not disclose the quality of groundwater that will be left at the Mine Site or the Tailings Basin throughout the centuries during which this pollution will continue. And while it provides some information regarding the quality of surface water in the West Pit Lake and Tailings Basin Pond, this information is incomplete.

In Minnesota, all groundwater is considered a public resource; groundwater is not considered to be the property of the surface or mineral estate owner to pollute at will. It is not the law in Minnesota that property owners may pollute the water on their own property as long as it meets legal standards at the property line. Whatever special provisions may be allowed for mining, groundwater at the site remains a public resource, and proposed impacts to that resource must be disclosed during environmental review.

Under Minnesota law, “waters of the state” include groundwater. Minn. Stat. § 103G.005(17). Minnesota law protects the quality of all groundwater, regardless of location. See Minn. R. 7060.0300(6) (“‘Underground water’ means the water contained below the surface of the earth in the saturated zone, including, without limitation, *all* waters . . .” (emphasis added)). Groundwater is thus a public rather than a private resource.

Minnesota regulations provide that the highest and best use for all groundwater is as potable water. Minn. R. 7060.0400. Regulations forbid the deposit of waste “in such place, manner, or quantity that the effluent, or residue therefrom, upon reaching the water table, may actually or potentially preclude or limit the use of the underground waters as a potable water supply, nor shall any such discharge or deposit be allowed which may pollute the underground waters.” Minn. R. 7060.0600(2). Any degradation of

groundwater quality (even if it does not reach the point of violating standards) is allowed only if the Minnesota Pollution Control Agency makes a determination “that a change is justifiable by reason of necessary economic or social development and will not preclude appropriate beneficial present and future uses of the waters.” Minn. R. 7060.0500. The SDEIS makes no mention of this requirement, and thus also does not explain whether or how the project will meet the requirement.

While variances are available under the groundwater rules, *see* Minn. R. 7060.0900, the SDEIS says nothing about PolyMet applying for a variance, and provides no basis whatsoever for the use of the property line as a compliance boundary. The MPCA has apparently been using property lines as compliance boundaries for groundwater contamination as a matter of standard practice, according to a personal communication with Richard Clark of MPCA on January 11, 2014. MPCA has apparently adopted this practice without promulgating regulations and apparently without assessing the ability of industrial facilities to better control their discharges to groundwater on a case-by-case basis. This practice has, in effect, become an unwritten rule without public notice or review, and, as such, is an improper method of establishing a compliance boundary. It is also poor public policy; as groundwater at the site is a public resource, it should not be the case that the company would be allowed to pollute it to a greater distance simply by buying more property. If the agencies intend to establish the compliance boundary at the property line, the SDEIS must provide justification based on the particular site and the waste involved.

Furthermore, regardless of the location of the compliance boundary, the SDEIS must disclose the predicted quality of groundwater at the Mine Site during the proposed mining operations and after closure, including within the East Mine Pit porewater and below each of the mine features. The SDEIS must also disclose the predicted quality of groundwater within the Tailings Basin and immediately below the Tailings Basin Dams and other seepage locations. All of this water belongs to the public.

Finally, the SDEIS must disclose the predicted quality of surface water created by the Proposed Project. Water in the West Pit and the Tailings Basin is predicted to have elevated levels of many constituents. *See* Water Monitoring Data Package Vol. 1 and 2 (PolyMet 2013i and 2013j). Whether or not surface water quality standards apply to this water, the water has the potential to adversely impact wildlife, particularly birds. The predicted water quality thus must be considered and disclosed in the SDEIS.

D. The Assessment and Discussion of Mercury Loading to the Partridge and Embarrass River Systems is Inadequate in Many Ways

The level of mercury in fish tissue in Northeastern Minnesota is one of the region’s most pressing environmental issues. Regulators have known for decades that fish in this region have a high mercury concentration in comparison to the rest of the state and most of the continent. Residents of the area also eat more fish than average, and this is especially true of tribal members. In a recent study, the Minnesota Department of Health (MDH) found that ten percent of infants born in the Minnesota portion of the Lake

Superior watershed had blood mercury levels that can affect neurological and brain development. Patricia McCann, MDH, *Mercury Levels in Blood from Newborns in the Lake Superior Basin*, (Nov. 30, 2011) (Ex. 21). According to PolyMet's reference documents, Heikkalla Lake fish are unsafe to eat due to an annual mercury deposition load of 24 grams. See Barr 2013k, Attachment F, Table 5-5. One has to wonder what parents who are struggling with a child's developmental delays would think of the position that removal of one pound (464 grams) of mercury from air emissions is not worth \$44,000. See Barr 2012r at 27.

Because of this situation, new or increased mercury discharges to waters that do not meet water quality standards are forbidden, no matter how small. Minn. R. 7052.0300(2) ("Where designated uses of the waterbody are impaired, there must be no lowering of the water quality with respect to the GLI pollutants causing the impairment"); 7052.0300(1) ("lowering of water quality" means "a new or expanded point source discharge of a [Bioaccumulative Substance of Immediate Concern] to an outstanding international resource water"); 7052.0300(3) (all surface waters within the basin are outstanding international resource waters); 7052.0350(K) (mercury is a BSIC). This prohibition applies to certain nonpoint sources as well. See 40 C.F.R. Part 132, App. E, Section 1 ("This antidegradation standard shall be applicable to any action or activity by any source, point or nonpoint, of pollutants that is anticipated to result in an increased loading of BCCs to surface waters of the Great Lakes System and for which independent regulatory authority exists requiring compliance with water quality standards.")

SDEIS Table 4.2.2-2 lists Sabin/Wynne, Embarrass, Esquagama, and Colby Lakes and the St. Louis River as impaired for mercury in fish tissue. In addition, according to Table 4.2.2-4, the following streams do not meet the numeric water column standard of 1.3 ng/L, set to protect wildlife use: Partridge River, Longnose Creek, West Pit Outlet Creek, Wetlegs Creek, Wyman Creek, Embarrass River, Unnamed Creek, Trimble Creek, Mud Lake Creek, Bear Creek. Finally, although not included in the list, Second Creek is described as having a mercury level of about 4 ng/L, PolyMet 2013i at 313. These rivers and creeks would also be considered as impaired for the purposes of the GLI regulations.

Apparently with these regulations in mind, the SDEIS predicts a decrease of 1.2 grams in the annual mercury load to the Partridge River, and an increase of 0.6 gram to the Embarrass River, with a net decrease to the St. Louis River of 0.6 gram. The SDEIS does not say what was included in these estimated loads, nor does it explain that the increased load from the project's air emissions will be significantly greater than that 0.6 gram. The SDEIS assesses the increased load from emissions to five area lakes (ignoring the Partridge and Embarrass Rivers) and dismisses the increase as insignificant, in direct contradiction to the clear government policy that *any* increase in load to the Lake Superior basin must be considered significant.

The Lake Superior community has been working together to eliminate mercury discharges and emissions since before 1991, when the Bi-National Program to Restore and Protect the Lake Superior Basin was signed by the governors of Minnesota,

Wisconsin, and Michigan, the Ontario premier, and representatives of U.S. EPA and Environment Canada. The Bi-National Program established the Zero Discharge Demonstration Project, which includes the goal of zero discharge and emissions of several bioaccumulative toxic substances, including mercury. Lake Superior Binational Program, “Lake Superior Lakewide Management Plan (LaMP) 2000 Summary Edition,” (Ex. 2). This goal was incorporated in the Lakewide Management Plan (“LaMP”), a joint U.S./Canadian water and land resource protection plan that on the U.S. side is mandated by the federal Clean Water Act. *Id.* The LaMP has set the goal of virtual elimination of mercury discharges and emissions in the Lake Superior Basin by the year 2020. Lake Superior Binational Program, “Lake Superior Zero Discharge Demonstration Program and Critical Chemical Reduction Milestones” (2012) (Ex. 22).

While it is true that much of the mercury deposited in the Lake Superior Basin comes from other places, the thinking behind the zero discharge and emissions goal was that before we asked others to decrease their mercury emissions for our benefit, we should be willing to decrease our own. Furthermore, although the increased load to downstream lakes from this project may be less than one percent, it likely will contribute more mercury to those lakes than any other single facility. This is the classic situation of cumulative impacts, and the LaMP strategy is specifically designed to end the impasse caused by a situation where no single source is large enough to be considered “significant.” *See e.g.*, 40 C.F.R. § 1508.7 (“Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time”).

The SDEIS does not so much as mention the Lakewide Management Plan, and it certainly does not address the zero discharge and emission goal. While five pounds of mercury emissions may not seem like a large amount, it does impact the zero discharge goal and it will increase the load to local water bodies. In order to consider all relevant factors and take the required “hard look” at the anticipated environmental consequences, the SDEIS needs to disclose that the Proposed Project will not comply with the LaMP. *See* 40 C.F.R. § 1502.16(c) (an EIS shall include discussion of “[p]ossible conflicts between the proposed action and the objectives of Federal, regional, State, and local . . . land use plans, policies and controls for the area concerned”).

In addition, the assessment of mercury releases from the Proposed Project to the Partridge and Embarrass River (and beyond to the St. Louis River) omits mercury from a number of sources. In fact, the only inputs of mercury to the rivers that the SDEIS discloses seem to be those that are discharged from the Waste Water Treatment Plant and Waste Water Treatment Facility. The estimate of increased or decreased loading to the rivers leaves out mercury from air deposition, from leaching to groundwater, and from the transfer of Colby Lake water. When these sources are accounted for, the statement that overall, the project would decrease mercury loading to the Partridge River and to the downstream St. Louis River, *e.g.* SDEIS 5-8, is simply untrue.

1. The SDEIS Dismisses the Possibility of Mercury Transport to the Partridge River Through Groundwater Without Scientific Support

Despite indications from humidity cell tests that leachate from waste rock will have a mercury level of almost five times the surface water quality standard, PolyMet did not include mercury in its water quality model, and the SDEIS provides no estimate of the potential discharge of mercury from the stockpiles and pit lakes to the Partridge River via groundwater. The mercury discussion attempts to justify the lack of a quantitative analysis based on NTS lab tests of questionable applicability. See SDEIS 5-202. These tests allegedly indicated that contact with Duluth Complex rock removes mercury from water, from a concentration of 12 ng/L to a concentration of between 1.2 and 3.2 ng/L, over the course of 36 days. The SDEIS does not describe how the test might be used to approximate field conditions, and does not actually say what conclusion is being drawn as far as a quantitative prediction of mercury concentrations.

We were unable to find a more thorough description of the NTS lab tests or any quality assurance/quality control information in the record. The reference document cited by the SDEIS provided a similar description with no additional information. SRK2007b at 82. That document in turn cites document RS66 (Barr 2007), which is not included in the list of SDEIS references but which we were able to obtain from the DNR. However, RS66 does not mention the NTS tests. Presenting this type of technical, scientific data with no supporting documentation does not comply with NEPA. See 40 C.F.R. § 1502.24 (EIS “shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement.”) Furthermore, including reference citations indicates to the reader that support exists; the absence of the information in the cited references does not speak well of the trustworthiness of the SDEIS as a whole.

In contrast to the NTS lab tests, SRK 2007b describes humidity cell tests that indicate that mercury leaches from Duluth Complex rock at average concentrations of 5 to 7 ng/l. After describing the NTS lab tests, the document concludes that “The results imply that the mercury concentrations observed in leachates are indicative of equilibrium concentrations” and goes on to report mercury concentrations as averaging 6 ng/L. It thus seems appropriate to disregard the NTS “data” and begin the analysis with a leachate concentration of 6 ng/L.

According to the SDEIS, “insufficient data and a general lack of definitive understanding of mercury dynamics prevented modeling mercury like the other solutes.” SDEIS 5-201. While we agree that the low-level mercury data from the humidity cell tests is insufficient, this factor was entirely within the Agencies and PolyMet’s control. If the Agencies now want to plead insufficient data, at the very least NEPA regulations require them to explain why they were not able to obtain it, and to provide an evaluation of the potential for increased loading to the Partridge River “based upon theoretical approaches or research methods generally accepted in the scientific community.” 40 C.F.R. § 1502.22(b)(4).

The SDEIS also provides no reference or explanation for its apparent position that “a general lack of definitive understanding of mercury dynamics” prevents any prediction of increased loading to the Partridge River through releases to groundwater. A similar analysis was done for the Eagle Mine in Michigan’s Upper Peninsula in 2006. Jerry Eykholt and Steven Donohue, Foth & Van Dyke, Memo re: Analysis of Contaminant Transport of Total Mercury from Groundwater Infiltration at the Eagle Project Site (Jan. 20, 2006) (Ex. 23). The SDEIS needs to provide an explanation as to why such an analysis is not possible at this site. Furthermore, if the analysis truly is impossible, the SDEIS should err on the side of caution and estimate a load based on the humidity cell test leachate, rather than dismissing this mercury source altogether.

The conclusion that “mercury released from waste rock and ore at the Mine Site is not expected to be a constituent of concern in groundwater seepage,” SDEIS 5-202, is unsupported. As explained above, *any* release of mercury via groundwater within the Lake Superior basin is significant and a matter of concern. Whether through modeling or by some other mechanism, the SDEIS must provide a more realistic accounting of the potential for an increased mercury load to the Partridge River via releases to groundwater. Although groundwater clearly does lose mercury content as it moves through soils, it is highly unlikely that the amount reaching the Partridge River from leachate from mine features will be zero.

2. The SDEIS Uses Arbitrary Numbers for Many Mercury Inputs

The SDEIS provides mass balance analyses for the West Pit and the Tailings Basin. While the proposed plan is to collect and treat water from both sources before it is discharged, some of the water will seep into groundwater and make its way to surface water without treatment. Although the SDEIS predicts that the amount of escaped seepage will be very small, these predictions are based on flawed analyses regarding hydrology (at the Mine Site) and the effectiveness of the collection system (at the Tailings Basin). It thus becomes important that the numbers used in the mass balance analyses are as accurate as possible. As with other parameters and issues throughout the SDEIS, if numbers are uncertain, the error should be on the side of protecting the environment.

a. The Estimated Mercury Concentration in Tailings Basin Seepage is Not Based on All Available Data

The SDEIS estimates seepage water from the Tailings Basin at a mercury concentration of 1.1 ng/L. SDEIS 5-206. This is based on current seepage from the LTV tailings “which has averaged about 1.1 ng/L.” *Id.* This in turn appears to be based on the average at two seepage points, SD026 and SD004. *Id.* 5-205. The SDEIS does not explain why the estimate was limited to these two points.

SDEIS Table 4.2.2-4 provides current mean mercury concentrations for several “LTVSMC Tailings Basin Surface Water Seepage” locations. First, it should be noted that several monitoring points in this list are of ponded water, i.e., Cells 1, 2, and 3 and

the Emergency Basin, rather than seepage water. *See* Barr 2006f. Most of the very low mercury concentrations are in this ponded water. Only two of the *seepage* monitoring points have a mercury concentration below 1.3 ng/L, one of which is SD004. SD026 does not appear on this table.

Furthermore, all of this data applies to surface seepage, but the SDEIS apparently applies it to groundwater seepage as well. In fact, given the assumption that 100 percent of surface seepage will be collected, it would seem that the analysis of mercury escaping from the water collection system would apply *only* to groundwater. However, groundwater data from current seepage shows a much higher mercury concentration than surface seepage does. SDEIS Table 4.2.2-23 provides a mean mercury concentration for existing groundwater at the toe of the Tailings Basin of 6.4 ng/L. Data from wells that appear to be unimpacted by the Tailings Basin indicate a mean background groundwater concentration of 4.8 ng/L. SDEIS Table 4.2.2-22.

Table 4.2.2-23 also provides data for ponded water, and indicates that the mean mercury level in ponded water is 1.4 ng/L. As the SDEIS points out, “Comparing existing pond water quality with water quality at the toe of the Tailings Basin helps define the effect passage through the existing LTVSMC tailings has on seepage water quality.” SDEIS 4-111. The effect shown for mercury is an increase of 5 ng/L.

The SDEIS does not mention this apparent anomaly, or attempt to reconcile it with the conclusion that the tailings remove mercury from water seeping through them. Rather, it states that the proposition that “taconite tailings appear to be a sink for mercury in full-scale actual tailings basins in northern Minnesota, at least similar to other media like soils . . . is supported by surface and groundwater monitoring around the existing LTVSMC Tailings Basin, which found mercury concentrations consistent with baseline levels (see Table 4.1-31), generally averaging less than 2.0 ng/L.” SDEIS 5-202. This statement in regards to groundwater appears to be blatantly false. And an attempt to learn more from Table 4.1-31 was thwarted by the fact that there is no Table 4.1-31.

Similar to the analysis for the Mine Site, the SDEIS defends the use of 1.1 ng/L by reference to a bench study by NTS. SDEIS 5-206. The text provides a reference of NTS (2006), but no corresponding document can be found in the reference list. However, a description of the test is found in Appendix C of Barr 2007e (which we came across in search of something else). The description refers to the test as a “shake-flask” test, but does not say what that means in this context; the procedures described do not seem to refer to a standard shake flask method. Although the graph states that the jugs were “agitated by reciprocating platform shaker,” it does not say when, how often, or how long this occurred. The test was conducted for only 480 minutes, and the last sample taken showed a small increase in mercury concentration. It remains unknown whether this level would have continued to rise. Furthermore, comparing the test of tailings to the control test, the best that could be said is that the Tailings Basin showed a 40% greater reduction than the control situation.

This is essentially meaningless, however, as there is no basis by which to extrapolate this test to field conditions, and no analysis that purports to do so. In contrast, humidity cell tests (a far more standard procedure subject to a great deal of field experience) of pilot tailings showed an increase (albeit small) in mercury concentrations. SRK2007c, App. C.4. The conclusion that NorthMet tailings will remove mercury from tailings basin water thus appears to be unfounded.

The SDEIS does not address mercury in water that escapes the tailings basin collection system. As discussed at other places in these comments, modeling of the movement of other constituents through groundwater is unrealistic and incomplete. Overly optimistic assumptions about the amount of water that will be captured, lack of knowledge (and non-conservative assumptions) about hydrology at the site, and the placement of evaluation points far downstream of the earliest venting points all conspire to show that there will be no discharge of pollutants above water quality standards. Each of these factors needs to be addressed and adjusted, followed by an analysis of mercury discharge to surface water from groundwater using a realistic estimate of mercury concentrations in groundwater leakage from the tailings basin. See *e.g.*, 40 C.F.R. § 1502.24 (agencies must “insure the professional integrity, including scientific integrity, of the discussions and analyses” in an EIS).

b. The SDEIS Uses Numbers for the Mass Balance Demonstrations That Appear to Have No Scientific Basis

Several other values used in the two mass balance demonstrations also have questionable bases. Although these values generally apply to relatively small volumes of water and are thus not of great significance in the mass balance outcomes, the potential that the volumes might change or that these values might be transposed to other applications makes it worthwhile to mention them.

Inputs to the West Pit mass balance from watershed run-off (from both undisturbed surfaces and from the East Pit) are estimated at 4 ng/L. Table 5.2.2-50, SDEIS 5-203. Despite the availability of an MPCA method for estimating mercury inputs from terrestrial deposition, which was actually used for the air emissions analysis for this project, this number was based on “the total mercury concentrations observed in the Partridge River (the recipient of watershed runoff under current conditions).” PolyMet 2013i at 313. Our understanding of the MPCA method is that it is based on mercury in deposition, one-quarter of which is estimated to enter surface water. While it is unclear how this would ultimately compare to the 4 ng/L for the volume used in the mass balance, the use of the concentration in the river as a proxy seems a poor substitute.

Inputs from the East Pit porewater are estimated at either 3 ng/L (as reported in the text of the Water Modeling Data Package, *id.*, or 4 ng/L (as reported in Table 5.2.2-50). The text states that this is based on background groundwater concentrations. As discussed above, it appears that the waste rock (which will fill the East Pit) does leach mercury. Based on the humidity cell tests, a more appropriate value for East Pit porewater would be at least 6.5 ng/L.

As noted above, the 1.1 ng/L mercury concentration for Tailings Basin seepage water ignores much of the relevant data. In addition, the analysis uses a value of 1.1 ng/L for runoff from tailings areas. Table 5.2.2-52, SDEIS 5-206. This seems incredibly optimistic, given that run-off often occurs very quickly after a rainfall or during snowmelt. No explanation is given for the use of 3.5 ng/L for other runoff; again, it would seem more accurate to follow the MPCA method.

3. The SDEIS Must Include an Assessment of Mercury Inputs from Air Emissions to the Partridge and Embarrass Rivers and Their Tributaries

The SDEIS provides an assessment of the deposition of mercury from the Proposed Project air emissions to several area lakes, most of which are located within the Embarrass or Partridge River systems. However, the SDEIS arbitrarily and without explanation fails to do the same for the Embarrass and Partridge Rivers and their tributaries. To comply with NEPA, the SDEIS must provide an analysis of the deposition of mercury from air emissions for the rivers and their tributaries, and that analysis must include mercury emissions from the mine site.

The rationale for omitting mercury emissions from the mine site is unclear; the text simply says that the analysis was not done because the predicted emissions were less than one pound. It appears from Table 1 of Reference Document Barr 2011h that the predicted amount is 0.636 lb/year. This amounts to 288 grams. Because all of it would be in the form of fugitive dust, it seems that virtually all of it would be deposited locally. Furthermore, the local area would likely be much smaller than the area used for the plant site emissions. According to the Wetlands Data Package, “initial modeling of dust deposition identified that deposition rates changed very little beyond about 1 kilometer from the ambient air boundary.” PolyMet 2013b at 32. At the mine site, all of the area within one kilometer of the ambient air boundary is within the Partridge River watershed. It thus seems likely that close to 100% of the 288 grams of mercury emissions would be deposited within the Partridge River watershed. If twenty-five percent of that mercury reaches surface water, it would amount to 72 grams of mercury. Even if half of it settles in areas where it would be routed to process water and the treatment facility, it would still be a significant amount of mercury, particularly when added to deposition from the Plant Site. In reviewing the modeling of emissions from the Plant, it appears that the vast majority of the mercury emitted would not be deposited locally. It seems entirely possible that more of the 0.6 pounds of mercury in fugitive dust at the Mine Site would end up in a local river than would the 4.6 pounds from the Plant.

According to the analysis done for the lakes based on Plant emissions, between 3.76 and 15 grams of mercury would be added to Colby Lake through the Partridge River watershed and between 4.75 and 19.64 grams would be added to Wynne Lake through the Embarrass River watershed. Barr 2013k, App. F. It appears from Large Figure 7 of the same document that the numbers would be similar for the Partridge and Embarrass Rivers, respectively, because most of the watersheds flow to the rivers before entering the

lakes. In other words, most of this mercury enters the rivers before it enters the lakes. The SDEIS needs to provide the same analysis for the rivers that it provides for the lakes.

This analysis must also be applied to those tributary streams that would be more heavily impacted than the river as a whole. For instance, it looks as though Second Creek would be particularly impacted. The upper reaches of this sub-watershed are likely to receive the highest level of deposition produced by the Project. See SDEIS Figure 5.2.3-23.

The SDEIS must then include input from air deposition in the load analysis. The assessment of mercury load to the Partridge River predicts a net decrease from 24.2 to 23.0 grams per year; the assessment for the Embarrass River predicts a net increase from 22.3 to 22.9 grams per year. These figures apparently do not include deposition; what they do include can only be guessed. It is certainly not clear to the average reader that the largest source of mercury from the project has been left out of the equation entirely.

Finally, the increased load cannot be dismissed as insignificant based on a comparison to total deposition from all sources. To reiterate, this is a classic cumulative impact situation; many sources contribute to the problem, most of them unknown and unknowable, with no single one judged as significant on its own. The environmental effect, however, is more than significant; it has created a public health issue that affects one-tenth of the future population. Cumulative impact assessment requirements are further explained below.

The cumulative impacts assessment points to the statewide TMDL to address this problem. SDEIS at 6-63. But the TMDL has been acknowledged as insufficient to address the problem in Northeastern Minnesota. When the TMDL has been completely implemented and a 93% reduction is achieved, Wynne Lake (for example) will still be subject to fish consumption advisories. If the NorthMet project were operating at that point, it would be contributing 17% of the load to Wynne Lake, which is clearly significant. Yet the same amount of mercury is now being dismissed as too small to contribute to the problem.

4. The SDEIS Must Address Mercury in Colby Lake Water Used to Augment Flows to Embarrass River Tributaries and Second Creek

The SDEIS makes the remarkable statement that the contribution of mercury from Colby Lake makeup water at the Plant Site would be “minor.” SDEIS 5-205. Perhaps it means that the amount used in the Plant itself would be minor considering other sources. The mercury released directly to headwater streams and wetlands when using Colby Lake water for stream augmentation would certainly not be minor.

Colby Lake is on the impaired waters list for mercury in fish tissue. According to the SDEIS, the concentrations of mercury in fish tissue in Colby Lake are so high that the lake is not covered by the statewide TMDL. Mercury in the water column measures between 4.8 and 6.0 ng/L.

PolyMet plans to release this water to headwater streams at a point where the current mercury levels average 1.0 to 1.2 ng/L. *See* SDEIS Tables 4.2.2-4 and 4.2.2-34. The change will mean that the streams no longer meet the water quality standard at their headwaters, and downstream exceedances will increase. Ultimately, the use of this water will increase the load to the Embarrass River between 3 and 6.5 grams per year, which is an increase of between 14 and 27 percent. The SDEIS is scant on information about mercury in Second Creek, but the discharge of Colby Lake water would increase the mercury exceedances there as well.

We can only guess that the reason this was not included in the SDEIS is because PolyMet (and apparently the Agencies) take the position that this discharge is not regulated by the Clean Water Act. But whether or not this is true, this is not a valid basis for omitting significant impacts from the SDEIS. Furthermore, whatever the import of the federal Water Transfer Rule, as explained in the discussion of aluminum, this discharge is at least regulated under state law.

In this case, the impacts will be exacerbated by the manner by which PolyMet plans to discharge the water, which is to spigot it into wetlands below the entire stretch of the south wall of the Tailings Basin. Although Colby Lake water is lower in sulfates than Tailings Basin seepage, it may actually be the case that mercury methylation is greater at this level (between 33 and 53 mg/L, *see* Table 4.2.2-18, SDEIS 4-87) than it is at the higher Tailings Basin seepage level. *See* SDEIS 5-207 (citing Mitchell et al. 2008).

Adding to the mix is a lack of information about the augmentation plan. The SDEIS provides a minimum and maximum release amount, but does not describe how the amount of release will be set or how it will change based on the project's needs and/or impacts on wetlands and streams. If it is similar to other mining operations, it will fluctuate according to the needs of the project. If this is the case, another factor that increases mercury methylation will also be present, i.e., water level fluctuations.

In sum, despite years of scientific study and work to decrease mercury loadings and the related significant public health concern, this entire plan seems specifically tailored to increase mercury levels in downstream fish. In addition to running directly counter to applicable goals, standards and requirements, the augmentation of flows and wetland hydrology below the Tailings Basin with Colby Lake water is simply a bad idea. If nothing else, PolyMet needs to come up with another solution to its water supply and management issues. And to comply with NEPA, the agencies must do a much better job of assessing and disclosing this important issue in the SDEIS.

5. Sulfate Discharges and Water Level Fluctuations from the Proposed Project Would Contribute to Mercury Levels in Fish

The SDEIS discusses the contribution of sulfate discharges and water level fluctuations to the methylation of mercury at SDEIS 5-207 to -210. It concludes that because the WWTP will limit sulfate in its discharge to 9 mg/L, sulfate “would not be

expected to promote mercury methylation.” SDEIS 5-208. However, 9 mg/L is significantly above historic background levels, and the SDEIS cites nothing that indicates that a sulfate level of 9 mg/L does not promote mercury methylation. While the science is not yet definitive, it is entirely possible that 9 mg/L sulfate promotes mercury methylation as effectively as does 30 mg/L, and more effectively than does 100 mg/L. While the reduction in sulfate levels in discharges to the environment is overall a positive step, this does not negate the fact that sulfate discharges will continue to promote mercury methylation.

The SDEIS goes on to discuss water level fluctuations as a contributing factor in mercury methylation as a general proposition, but says not one word about the various ways in which the Proposed Project would increase (or decrease, or mitigate) such fluctuations. The discussion goes directly from “Hydrologic changes and water level fluctuations can stimulate mercury methylation and enhance bioaccumulation” to “Based on the above analysis, the NorthMet Project Proposed Action would have negligible effects on hydrologic changes or water level fluctuations in the Partridge river and Embarrass River.” SDEIS 5-210. In short, there is no “above analysis.”

The Proposed Project involves several situations that may involve water level fluctuations. Baseflow will be reduced in the Partridge River, which could exacerbate fluctuations due to precipitation events, the natural variation in water levels, and the variation in Northshore Mining discharge. This is true for groundwater as well, which is likely to increase water level fluctuation in wetlands. As noted above, the SDEIS does not describe factors that will affect the amount of flow augmentation at the Tailings Basin. Without that information, the effect on water level fluctuation is unknown, but based on experience at other mines, some amount of fluctuation in discharge can be expected. At Colby Lake and Whiteface Reservoir, water fluctuations are certain to occur due to variations in the amount of water withdrawn for makeup water. To comply with NEPA, all of these situations need to be addressed in the discussion of mercury methylation. See *Mid States Coalition for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 536 (8th Cir. 2003) (in NEPA analysis, agency must “explain fully its course of inquiry, analysis and reasoning”).

6. The SDEIS Must Address the Potential for Mercury Mobilization From Overburden Materials

The initial stage of preparation for mining will involve stripping the vegetation and soil from the area to be mined. SDEIS 3-2. This material will contain sequestered mercury from historic precipitation and dry deposition. This is a particular concern in regards to the peat overburden, as peat is known to sequester mercury. The SDEIS does not seem to include an estimate of mercury releases from this source.

The overburden material will initially be placed in the unlined Overburden Storage and Laydown Area (OSLA). SDEIS 3-37. This material would then be available for various construction and reclamation uses. Saturated overburden (which has the potential to produce acid) would be used for construction in areas where storm water

would be collected and treated, with the excess going to the lined waste rock stockpiles and ultimately to the East Pit. Unsaturated overburden (which is assumed to be non-acid producing) would be used in areas where runoff flows directly to streams. See SDEIS p. 3-44.

The discussion of mercury from this source states that stormwater runoff from the OSLA would be collected and sent to the Tailings Basin in years 1 to 11 and to the East Pit in years 12 to 20, where the mercury would allegedly be sequestered. After year 20, the OSLA would be closed, and runoff water would apparently be routed to the West Pit. See SDEIS 5-204 and Table 5.2.2-51.

The initial difficulty with this discussion is that there seems to be no estimate of the amount or concentration of mercury in these materials, or their propensity to release mercury when water moves over or through them more quickly than it does when they are compacted in the ground. In general, the mass balance exercises do not consider the amount of mercury released from rock and other materials in assigning a value to process water concentrations. Rather, mercury concentration values are simply guesses based on current mercury levels in precipitation and (in some cases) groundwater, along with questionable assumptions regarding the adsorption capacity of tailings, rock, and soil. Thus the statement that mercury from the OSLA “is included in the mass balance as part of the Process Water input,” SDEIS 5-204, appears to mean only that the OSLA water was estimated as having the same mercury concentration as other process water, with no explanation or analysis whatsoever to support this estimate.

More problematic, as with waste rock, mercury discharge from overburden material through groundwater seepage has been omitted from the SDEIS completely. During the time that it is in operation, the OSLA will be the largest source of groundwater flow to the Partridge River of all of the mine features, estimated at 14 gpm. See Table 5.2.2-8, SDEIS 5-37. This is in contrast to the 10 gpm that the SDEIS points out will be released during closure. SDEIS 5-8. Water from the OSLA is estimated to travel much more quickly than the other flowpaths, and is predicted to arrive at the Partridge River years before the WWTF begins discharging treated water (which is the mechanism that would result in the predicted decrease in mercury load to the Partridge River). This mercury source must be accounted for before the Agencies can conclude that there will be no increased load to the Partridge River.

Finally, PolyMet plans to use the overburden material for many construction and reclamation activities in many locations. See PolyMet 2012s at 26-30. Uses of unsaturated overburden and peat are not specified; the material would be available for any use in any location where soil or rock is needed. The potential mercury releases from this material must be assessed. Precipitation events and snowmelt are known to cause spikes in mercury levels in local streams, particularly in watersheds that are partially deforested. See MPCA, “An Assessment of Lake Superior Basin Tributaries” (2002) (Ex. 24), and E. M. Ruzyski, R. P. Axler, J. R. Henneck, N. R. Will & G. E. Host, “Estimating mercury concentrations and loads from four western Lake Superior watersheds using continuous in-stream turbidity monitoring,” 14 Aquatic Ecosystem

4:422 (2011) (Ex. 25). The potential increases of mercury from disturbed peat and other overburden materials during runoff events must be included in the SDEIS' assessment of mercury loads to tributary streams and the Partridge and Embarrass Rivers wherever this overburden material might be used.

E. The SDEIS Fails to Consider and Disclose the Likely Effectiveness of Mitigation Measures, and the Consequences Should They Fail

To a great extent, the SDEIS avoids discussion of potential impacts of the Proposed Project by assuming that mitigation measures will be completely successful. In many situations, no support is provided for these assumptions. The SDEIS does not discuss the track record of the mining industry or the success rate of the chosen mitigation measures at other mines. The SDEIS thus does not take the requisite “hard look” at mitigation measures.

“[O]ne important ingredient of an EIS is the discussion of steps that can be taken to mitigate adverse environmental consequences.” *Robertson v. Methow Valley Citizens*, 490 U.S. 332, 351 (1989). An EIS must include “a detailed discussion of possible mitigation measures.” *Id.* Without “a reasonably complete discussion” of mitigation measures, “neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects.” *Id.* at 352. “Recognizing the importance of such a discussion in guaranteeing that the agency has taken a ‘hard look’ at the environmental consequences of a proposed federal action, CEQ regulations require that the agency discuss possible mitigation measures in defining the scope of the EIS, 40 C.F.R. § 1508.25(b), in discussing alternatives to the proposed action, § 1502.14(f), and consequences of that action, § 1502.16(h), and in explaining its ultimate decision, § 1505.2(c).” *Id.*⁶ MEPA similarly requires an EIS to identify mitigation measures that “could reasonably eliminate or minimize any adverse environmental, economic, employment, or sociological effects of the proposed action.” Minn. R. 4410.2300(I).

“An essential component of a reasonably complete mitigation discussion is an assessment of whether the proposed mitigation measures can be effective.” *South Fork Band Council of Western Shoshone of Nevada v. U.S. Department of the Interior*, 588 F.3d 718, 727 (9th Cir. 2009). NEPA requires that an EIS include a discussion of mitigation in order to evaluate whether anticipated environmental impacts can be avoided, and a mitigation discussion without any evaluation of effectiveness “is useless in making that determination.” *Id.* As similarly explained by CEQ, in order to “ensure that environmental effects of a proposed action are fairly assessed, the probability of the mitigation measures being implemented must also be discussed.” [CEQ Forty Questions,

⁶ Mitigation is defined to include (a) avoiding the impact altogether by not taking a certain action, (b) minimizing impacts by limiting the degree or magnitude of the action, (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment, (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, and (e) compensating for the impact by replacing or providing substitute resources or environments. 40 C.F.R. § 1508.20.

#19b]. “Thus the EIS and Record of Decision should indicate the likelihood that such measures will be adopted or enforced by the responsible agencies.” *Id.*

Similarly, the Minnesota Supreme Court has stated that under MEPA,

When an RGU considers mitigation measures as offsetting the potential for significant environmental effects under Minn. R. 4410.1700, it may reasonably do so only if those measures are specific, targeted, and are certain to be able to mitigate the environmental effects. The RGU must have some concrete idea of what problems may arise and how they may specifically be addressed by ongoing regulatory authority. There is a definite difference between an RGU review that approves a project with vague promises of future mitigation and an RGU review that has properly examined a project and determined that specific measures can be reasonably expected to deal with the identifiable problems the project may cause.

CARD v. Kandiyohi County, 713 N.W.2d 817 (Minn. 2006).

The PolyMet SDEIS relies heavily on mitigation measures to meet water quality standards and otherwise reduce environmental impacts, with many of these measures needed for decades to hundreds of years. The SDEIS, however, lacks any discussion of the likely effectiveness of the chosen mitigation measures. Similarly, the SDEIS lacks any discussion of the significant and irreversible environmental impacts that would occur if the chosen mitigation measures prove to be ineffective. The SDEIS thereby fails to take a hard look at the potential environmental consequences of the proposed action, and fails to comply with NEPA and MEPA.

1. The SEIS Fails to Address the Massive Amount of Funding that Necessary for the Chosen Mitigation Measures to be Effective

For the proposed action, the SDEIS relies on mitigation measures that would cost hundreds of millions to potentially billions of dollars to implement. For example, the SDEIS estimates that closure of the mine would cost as much as \$200 million, with post-closure monitoring and maintenance estimated at \$3.5 million to \$6 million per year. SDIES 3-138. This monitoring and maintenance will be needed for hundreds of years into the future, and likely in perpetuity, as the SDEIS indicates that mechanical water treatment will be needed for at least 200 years at the mine site, and 500 years at the plant site, which was the extent of the modeling period. SDEIS ES-24. Graphs from the Water Modeling Data Package Vol. 1 and 2, PolyMet 2013i and 2013j, indicate that for some constituents in some locations, the level of contamination will continue beyond 200 years without any decline over that time period, and with no indication of a time when the levels might begin to decline. The SDEIS provides no meaningful discussion as to how these mitigation measures could possibly be fully funded and remain 100 percent effective for hundreds or even thousands of years after closure of the mine. Such a

glaring lack of analysis and disclosure on such an important issue violates NEPA's fundamental requirement that agencies take a "hard look" at the potential environmental consequences of a proposed action.

As explained by the Tribal agencies, some of the mitigation necessary for the proposed action would be needed forever:

The hydrometallurgical residue facility is proposed to contain tailings generated from the hydrometallurgical beneficiation process. These tailings are the most heavily contaminated materials that would be produced at the site and must be separated from the surrounding aquatic environment. This facility has a double liner and cover system that will likely be an effective containment system in the short term. But, given time, this containment system, like all human-made structures, will degrade and fail. No human-made structure has lasted forever, and it is illogical to assume that this facility will. Therefore, this facility will need maintenance, repair and monitoring in perpetuity.

SDEIS Appendix C. Additional components of the proposed action that would require extremely long-term or perpetual maintenance include the water treatment plants, the water capture and pumpback systems at the Floatation Tailings Basin, the water collection system at the Category 1 Stockpile, the Category 1 Stockpile cover system, and the overflow control structure at the West Pit lake. *Id.* Because the SDEIS provides no background information or details as to how the agencies calculated that \$3.5 million to \$6 million would be required each year for monitoring and maintenance, there is no way to know whether all these features and components are included in that estimate. See *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1150 (9th Cir. 1998) ("NEPA requires that the public receive the underlying environmental data from which [an agency] expert derived her opinion"). Moreover, the SDEIS fails to provide any explanation as to how PolyMet could possibly provide the necessary funding to insure the effectiveness of these mitigation measures in perpetuity.

The incredibly long timeframe that would be required for the chosen mitigation measures at the Mine and Plant Sites requires that the SDEIS include a reasonable and meaningful discussion as to how these measures would be funded in perpetuity. As noted by the Tribal agencies, the State of Minnesota has only existed for 155 years, and it is illogical to assume that PolyMet and financial assurance instruments will still be around and available for at least 500 years into the future. SDEIS Appendix C. We have not been able to identify any financial instrument, including cash, that has ever remained stable over that length of time. By failing to include any consideration or disclosure as to how the perpetual monitoring and mitigation that is included as part of the proposed action would be funded, the SDEIS violates NEPA. See *Foundation for North Am. Wild Sheep v. U.S. Dept. of Agric.*, 681 F.2d 1172, 1178 (9th Cir. 1982) ("The omission of any meaningful consideration of such fundamental factors precludes the type of informed decisionmaking mandated by NEPA").

In 2011, CEQ issued a memorandum to all federal departments and agencies concerning the appropriate use of mitigation and monitoring under NEPA. According to the CEQ guidance, agencies should “specify the timeframe for the agency action and the mitigation measures in its decision document, to ensure that the intended start date and duration of the mitigation commitment is clear.” Ex. 26 at 8-9. Additionally, “*CEQ views funding for implementation of mitigation commitments as critical to ensuring informed decisionmaking.*” *Id.* at 9 (emphasis added). The SDEIS, by contrast, provides only a generalized statement indicating that mechanical water treatment will be needed for at least 200 to 500 years, and provides no detailed information regarding the massive funding that would be required in order to ensure the effectiveness of the extremely long-term mitigation commitments.

2. The SDEIS Fails to Consider and Disclose the Impacts Should the Chosen Mitigation Measures Fail

While agencies are no longer required to consider and disclose a “worst case scenario” within an EIS, NEPA still requires agencies to consider all reasonably foreseeable environmental impacts that may result from a proposed action. *See e.g.*, 40 C.F.R. §§ 1502.16, 1502.22, 1508.8. Based on the history of hardrock mining in the United States, it is at least reasonably foreseeable that the chosen mitigation measures will not be entirely effective, and at some point, something will fail. In fact, for this particular sulfide mine proposal, which relies on hundreds of years of mechanical water treatment in a very wet environment, mitigation failures are a near certainty. The SDEIS, however, entirely fails to consider and disclose the potential impacts on the environment if and when the chosen mitigation measures fail.

a. The SDEIS Fails to Consider and Disclose the Impacts if Water Treatment Does Not Continue for 500-Plus Years

As an initial point, we fail to see how a water collection and treatment system that would need to be operated and/or actively maintained for more than 500 years can meet the DNR Permit-to-Mine regulatory requirements concerning closure, continued oversight and financial assurance. Even if the agencies are willing to gamble on the long-term stability of monetary, societal, and regulatory systems, however, no one can reasonably argue that there is not a significant risk that one or all of these systems will fail over the course of time that water collection and treatment would have to continue to protect the environment. In the language of NEPA, it is reasonably foreseeable that water collection and treatment will end or otherwise fail before it has reached a level of purity at which it would have no impact on the environment. Thus aside from the question of whether this situation may be permitted under applicable law, NEPA requires that the impacts be disclosed in the SDEIS.

NEPA requires agencies to consider and disclose all reasonably foreseeable environmental impacts. *See* 40 C.F.R. § 1502.16 (requiring agencies to include discussion in EIS of direct and indirect effects and their significance); 40 C.F.R. § 1508.8(b) (defining “indirect effects” as those “which are caused by the action and are

later in time or farther removed in distance, but are still reasonably foreseeable”); *South Fork Band of Western Shoshone v. U.S. Dept. of Interior*, 588 F.3d 718, 725 (9th Cir. 2009). Because it is reasonably foreseeable that water treatment will fail or end prematurely, and as a result untreated water will be discharged to the Partridge River, the Embarrass River, and their tributary streams, the SDEIS must disclose the quality of that water and the impacts on aquatic life and other resources should it occur.

Additionally, the NEPA regulations require that agencies include in an EIS a discussion of significant risks:

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

(a) If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.

(b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because . . . the means to obtain it are not known, the agency shall include within the environmental impact statement: (1) A statement that such information is incomplete or unavailable; (2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and (4) the agency’s evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. *For the purposes of this section, “reasonably foreseeable” includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.*

40 C.F.R. § 1502.22(b)(1) (emphasis added).

On first blush this regulation may appear inapplicable, because in fact the agencies have a good understanding of the range of potential impacts that would result from a failure of the water collection and treatment systems. The “unknown” in this case is whether the required regulatory and economic systems will last as long as the need for treatment will. The agencies do not and cannot know this. The CEQ regulations require them to say so, and to reveal the significance of this lack of knowledge, i.e., the impacts on the Partridge, Embarrass, and St. Louis River if water collection and/or treatment end prematurely.

If the water collection and treatment systems do end prematurely, the impact on the Partridge, Embarrass, and St. Louis River systems would likely be catastrophic to fish, wildlife, and wild rice downstream, and possibly to the Hoyt Lakes water supply. Figures 5.2.2-37, -38, and -39 (SDEIS 5-155 to 157) show predicted contaminant levels for cobalt, nickel, and sulfates in the West Pit lake after the mine closes. This is the water that will be routed to the waste water treatment facility for treatment before direct discharge to a surface tributary of the Partridge River. If the treatment facility ceases to operate, this water will overflow from the West Pit directly into surface water streams.

The graphs do not include an indication of the surface water quality standards, but a comparison to those standards indicates that the discharge would be toxic to aquatic life if it was discharged directly to streams. The water quality standard for cobalt is 5.0 ug/L; Figure 5.2.2-37 indicates that at year 200, the predicted P90 level for cobalt in the West Pit is about 30 ug/L, and at the P50 level is about 15 ug/L. The water quality standard for nickel is 52 ug/L at an assumed hardness of 100 mg/L; Figure 5.2-38 indicates that at year 200, the predicted P90 level for nickel in the West Pit is about 300 ug/L, and at the P50 level is close to 200 ug/L. Even at the P10 level, it appears that the pit lake water will not meet the nickel water quality standard by year 200.

Even more problematic is the predicted copper level in the West Pit water. This is shown in Figure 6-62 of the Water Modeling Data Package Vol. 1 (PolyMet 2013i). The water quality standard for copper at a hardness level of 100 is 9.3 ug/L; the predicted level in the West Pit water at year 200 ranges between 120 and 580 ug/L. *Even at the P10 level, the predicted water quality is twelve times the standard.* Perhaps even more troubling, the figure does not show any decline in copper levels over time. This is apparently because a concentration cap was applied in the modeling. We question the use of such a cap, particularly in this situation where the result is that the model gives no indication of the water quality trend over time. Taking the figure as it is presented, however, indicates that the West Pit water may indeed need to be treated to remove copper to eternity.

The situation is similar for the Tailings Basin. A series of figures in the Water Modeling Data Package Vol. 2 (PolyMet 2013j) show predicted concentrations of various constituents in seeps at the “toes” of the basin over 200 years; this is water that will be collected and treated under the mine plan, and will discharge to the environment if the collection and treatment system ends. First, note that some of these figures show that the water quality will be better after the addition of the NorthMet project tailings than it would be under “continuation of existing conditions.” However, the continuation of existing conditions apparently does not account for dilution by rainwater, does not reflect the lower volume of discharge from the existing facility, and does not reflect any actions that Cliffs Erie (which is legally responsible for violations stemming from the existing tailings basin) must take to address the situation.

Figure 6-34 of the Water Modeling Data Package Vol 2 (PolyMet 2013j) indicates that sulfate levels in the discharge from the north toe of the Tailings Basin will range between approximately 100 and 200 mg/L at year 200. At the northwest and west toes,

the predicted range is between 200 and more than 400 mg/L. *Id.* Figures 6-38 and 6-42. The applicable water quality standard to protect wild rice is 10 mg/L. Much of the St. Louis River system is already heavily degraded in regards to sulfate levels and wild rice stands due to leakage and discharge from the mining industry, so the discharge of this water would add to an already intractable problem.

Figure 6-35 indicates that lead levels at the north toe will range between about 15 and 22 ug/L; the surface water quality standard is 3.2 for a hardness level of 100 mg/L. Once again, the figure shows little potential for a decrease to below the water quality standard over the following centuries.

Seepage at the south toe of the Tailings Basin will discharge to Second Creek, a tributary of the Partridge River, if it is not collected. This water is also predicted to contain sulfate levels of between 200 and 300 mg/L at year 200. *Id.* Figure 6-47. Predicted copper concentrations range from about 120 to 350 ug/L at year 200. *Id.* Figure 6-49. Lead levels range between about 20 and 30 ug/L. *Id.* Figure 6-50.

As with the copper levels at the mine site, the predicted lead levels in seepage from the Tailings Basin appear to be relatively constant over time. This is also true of sulfate at some locations. PolyMet and the DNR have used 500 years as the minimum amount of time that the discharge is likely to need to be collected and treated. The reality appears to be that the need for treatment will extend far beyond 500 years, that in fact the need for treatment has no foreseeable end.

The modeled length of time before untreated discharge would meet water quality standards is highly relevant information that must be revealed in the SDEIS. The fact that for some constituents the model indicates that water quality standards may *never* be met without treatment is absolutely critical to a reasoned decision, and to a determination of whether this project will reasonably be able to comply with other legal requirements. The actual quality of the water that will be released if treatment ends prematurely is just as critical, as is a discussion of what that water quality would mean for aquatic species, wildlife, wild rice, and human consumption. In the words of the CEQ regulations, this information is “essential to a reasoned choice among alternatives,” and it is thus incumbent on the agencies to provide it in the SDEIS.

b. The SDEIS Fails to Consider and Disclose the Likelihood of Other Mitigation Failures

As noted above, in addition to the hundreds of years of mechanical water treatment, the Tribal agencies have identified numerous mitigation measures that would be needed in perpetuity if the proposed action is implemented. This includes the perpetual monitoring and maintenance of the Hydrometallurgical Residue Facility, the water capture and pumpback systems at the Floatation Tailings Basin, the Category 1 Stockpile cover system, the Hydrometallurgical Tailings Facility, and the overflow control structure at the West Pit lake. SDEIS Appendix C. The Category 1 Stockpile water collection system may also need to operate in perpetuity. It defies common sense

and scientific integrity for the SDEIS to simply assume there will be no failures at any of these structures or facilities for hundreds of years into the future. See 40 C.F.R. § 1502.24 (agencies “shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements”).

In addition, the SDEIS assumes that mitigation measures will achieve a particular level of effectiveness, with nothing to support those assumptions. Some of these assumptions make an enormous difference in the predicted impacts of the Proposed Project. For example, the SDEIS assumes that more than 99 percent of the Tailings Basin seepage will be collected and treated. Table 5.2.2-36, SDEIS 5-159. If this prediction is off by only one percent, the amount of contaminated water entering wetlands and headwaters of the Embarrass River tributaries will double. Analyses that are dependent on this optimistic assumption include the distance at which the contaminated water will enter surface streams, water quality predictions throughout the system, and the increase of sulfate to downstream wild rice waters. A second example is the leachate collection system on the north side of the Category 1 Stockpile, which is assumed to be effective enough that no contaminants will leach to wetlands and Yelp Creek.

Minnesota Center for Environmental Advocacy, Friends of the Boundary Waters Wilderness, and Water Legacy are submitting comments that address the validity of these and other assumptions regarding the effectiveness of mitigation measures. Their comments are incorporated herein by reference. In addition, the Great Lakes Indian Fish and Wildlife Commission has submitted material regarding mitigation effectiveness for controlling spillage of ore in rail transport, SDEIS Appendix C, which is also incorporated by reference. The SDEIS needs to take a “hard look” at each of the mitigation measures that is relied on to reduce impacts, provide an objective assessment of the likely effectiveness of each mitigation measure, and provide a range of potential impacts that corresponds with the range of potential effectiveness. These assessments must be based on actual, real-world experience with the mitigation measures as used at other mines, rather than on the theoretical possibility that a measure could be 90 to 100 percent effective. If the measures have not been used enough to allow a real-world assessment of their effectiveness, the SDEIS must say so, and provide an assessment that includes the range of potential outcomes.

The SDEIS analysis of water quality impacts appropriately provides a range of potential impacts based on the uncertainty of several parameters. Unfortunately, there are many uncertainties that are not included in the analysis. Deterministic values (or a narrow range of values that does not reflect reality) are used for many parameters for which the value is in fact unknown. These include but are not limited to hydraulic conductivity and the effectiveness of water collection systems. These uncertainties must be disclosed, and the SDEIS must discuss what they mean in regard to impacts on water quality and quantity.

The statement that the P90 level presents a “worst case” analysis of water quality, SDEIS 5-77, is simply untrue. The P90 level presents a “worst case” scenario if everything goes exactly as intended: if no mistakes were made in designs, calculations, or

modeling inputs, if no mistakes are made in operations, if no larger-than-expected storms occur, etc. Presenting the P90 predictions as the worst that things would possibly be is a disservice to the public and to decision makers, both of whom will have to live with the consequences if anything goes wrong.

The fact is that most mines experience the failure of some mitigation measure that results in impacts that were not predicted in the project's EIS. The scientific reports "Comparison of Predicted and Actual Water Quality at Hardrock Mines," and "Predicting Water Quality Problems at Hardrock Mines: Methods and Models, Uncertainties, and State-of-the-Art," prepared by Jim Kuipers, P.E., and geochemist Ann Maest, Ph.D., analyze water quality predictions and outcomes at 25 representative metal mines permitted in the United States during the last 25 years. See Ex. 27 and 28. The reports find that faulty water quality predictions, mitigation measures, and regulatory failures result in the approval of mines that create significant water pollution problems. Despite assurances from government regulators and mine proponents that mines would not pollute clean water, the researchers found that 76 percent of studied mines exceeded water quality standards, polluting rivers and groundwater with toxic contaminants and exposing taxpayers to huge cleanup liabilities. Such a high failure rate at other mines clearly makes the potential failure of mitigation measures at the proposed NorthMet mine reasonably foreseeable.

Among the researchers' findings for the 25 mines examined in depth:

- 76 percent of mines exceed groundwater or surface water quality standards.
- 93 percent of mines that are near groundwater and have elevated potential for acid drainage or contaminant leaching exceeded water quality standards.
- 85 percent of mines that are near surface water and have elevated potential for acid drainage or contaminant leaching exceeded water quality standards.
- Water quality standards for toxic heavy metals, such as lead, mercury, cadmium, copper, and zinc, were exceeded at 63 percent of mines.
- Mitigation measures predicted to protect clean water failed at 64 percent of the mines.

Kuipers, *et al.*, Comparison of Predicted and Actual Water Quality at Hardrock Mines (2006) (Ex. 27).

This study distinguishes between “potential” impacts and “predicted” impacts as presented in EISs, with potential impacts being impacts that would occur without mitigation and predicted impacts being those that would occur with mitigation measures in place. Of the 60% of all mines that resulted in surface water quality violations, *all* predicted that mitigation measures would prevent such violations. In fact, the study found that

the predictions made about surface water quality impacts before the effects of mitigation were considered were more accurate than those made taking the effects of mitigation into account. Stated in another way, the ameliorating effect of

mitigation on surface water quality was overestimated in the majority of the case study mines.

Id. at 173. The same situation was found in regard to groundwater. *Id.* at 175.

The researchers found that mines located near surface or groundwater that tapped ore bodies with high potential for acid-generation or contaminant leaching, were at particularly high risk of resulting in water pollution. *Id.* This finding has serious implications for the proposed NorthMet mine.

These reports have been extensively peer-reviewed and presented at major conferences, including: U.S. EPA's Hardrock 2006 Conference in Tucson, Arizona; Society for Mining, Metallurgy, and Exploration's 2006 Annual Meeting in St. Louis; and the Mine Design, Operations and Closure Conference in Fairmont Hot Springs, Montana, also in 2006. These reports and their findings and conclusions must be fully and objectively disclosed and considered within the EIS for the PolyMet mine. Indeed, NEPA specifically requires agencies to disclose and respond to "any responsible opposing view" when preparing an EIS. *Id.* § 1502.9(b); *see also Seattle Audubon Society v. Moseley*, 798 F. Supp. 1473, 1479 (W.D. Wa. 1992), *aff'd Seattle Audubon Society v. Espy*, 998 F.2d 699 (9th Cir. 1993) ("[a]n EIS that fails to disclose and respond to 'the opinions held by well respected scientists concerning the hazards of the proposed action ... is fatally deficient.'"); *Earth Island Institute v. U.S. Forest Service*, 442 F.3d 1147, 1172-73 (9th Cir. 2006) (FEIS failed to respond "explicitly and directly" to conflicting views, and agency violated NEPA requirement to take a hard look and provide a full and fair discussion allowing informed public participation and informed decision-making).

The NorthMet mine would be the first-ever copper/nickel mine in the state of Minnesota. To comply with NEPA's disclosure requirements and the underlying purpose of NEPA, the agencies must fully disclose to the public the long history of past failures and severe environmental harm caused by hard rock mines across the country. Few if any activities have had more persistent, permanent and significant environmental impacts to water quality and other resources, and the SDEIS violates NEPA by failing to objectively and openly disclose this legacy of environmental pollution from the hard rock mining industry. Before permitting this type of mining in the state, the agencies must plainly and openly disclose the legacy of this industry in other parts of the country (e.g., 40% of the headwaters of all western waterways have sections that are polluted by mining, EPA, "Liquid Assets 2000: Americans Pay for Dirty Water," <http://water.epa.gov/lawsregs/lawsguidance/cwa/economics/liquidassets/dirtywater.cfm>, accessed March 11, 2014 (Ex. 29) and that EPA ranks the mining industry as the nation's top toxic polluter, reporting more toxic releases annually than any other industry sector, EPA, 2012 TRI National Analysis Overview (2014) (Ex. 30) (forty percent of all toxic releases are from metal mining industry).

Moreover, the SDEIS also fails to disclose the widespread pollution resulting from past and ongoing iron ore and taconite mining in this same region, and the MPCA's

failure to effectively regulate these sites and enforce environmental laws. Current and historic mining in the surrounding Iron Range have already resulted in a wild rice “dead zone” in the St. Louis River due to high levels of sulfates. John Myers, “In sulfate debate, future of Iron Range mining projects hangs in balance,” Duluth News Tribune (Date???). Acid mine drainage is already occurring at the Dunka Pit as a result of past mining. Interstate Technology & Regulatory Council, *Dunka Mine, Minnesota* (2010) (Ex. 32). A number of mining related facilities are or have been in violation of their water and air permits, including the LTV site where PolyMet proposes to dispose of its tailings. Clearly there is a significant risk that the SDEIS assumptions that all mitigation measures would operate as planned, that monitoring and “adaptive management” would take care of any problems, and that environmental standards would be enforced will prove untrue, just as they have proven untrue in other parts of the country (regarding sulfide ore mining) and in Minnesota (regarding mining in general). The SDEIS must include an objective assessment of the likelihood of success of mitigation measures, and that assessment must take account of this relevant information.

F. Without Financial Assurance Information, Conclusions That Potential Impacts Will Not Occur Are Unwarranted

In its February 18, 2010 comments on the earlier Draft EIS for the proposed PolyMet mine, the EPA made clear that detailed information concerning financial assurance needed to be included in the SDEIS. As explained by EPA:

Financial assurance should be discussed in a revised or supplemental Draft EIS because it is critical to determining whether all funding will be available and adequate for proper closure, reclamation, and post-closure care can be met by the mining company. Because the amount and viability of financial assurance are critical factors in determining the effectiveness of these activities, EPA believes it is necessary to analyze these factors in the revised/supplemental DEIS to determine the significance of potential impacts and the feasibility of long-term mitigation measures. For example, if appropriate closure, reclamation and post-closure care measures are significantly under-funded, contamination of surface water and groundwater may not be controlled. EPA believes the adequacy of financial assurance for these activities could make the difference between a project sufficiently managed over the long-term by the site operator, or an unfunded or underfunded contaminated site that becomes a liability for the Federal government and the public, e.g., under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Bharat Mathur, EPA, Letter to Colonel Jon L. Christensen, ACE (Feb. 18, 2010) (Ex. 1)..

We disagree with EPA’s subsequent comments stating that financial assurance is adequately described in the SDEIS, which appears to be an arbitrary change of course. In the same comments, however, EPA notes that the SDEIS is still not clear what financial assurance amount should be set for post-closure, and when the Wastewater Treatment Facility will need to begin using reverse osmosis. Alan Walts, EPA, Letter to Co-Lead

Agencies (Aug. 7, 2013) (Ex. 33). EPA further recognizes that if perpetual treatment will be needed, the SDEIS needs to disclose when this financial assurance mechanism would be put into place. *Id.* And EPA notes that additional financial assurance will be needed under Section 404 of the Clean Water Act for construction and long-term monitoring and management to ensure successful wetlands mitigation. *Id.*

Regardless of EPA's comments, the SDEIS' analysis and disclosure of the relevant issues involving financial assurance remains woefully inadequate. The critical importance of financial assurance for this proposed project – as recognized in EPA's earlier comments on the Draft EIS – has been repeatedly raised at the SDEIS public hearings, in the media, and even in a state legislative hearing that sought information beyond the very general discussion provided in the SDEIS. Moreover, the little information that is provided in the SDEIS demonstrates the compelling need for detailed financial assurance information, as it discloses that mechanical water treatment may be needed for at least 500 years, that initial closure costs will be as high as \$200 million, and that annual monitoring and maintenance costs are estimated at \$3.5 to \$6 million. SDEIS 3-138.

PolyMet is the first proposed sulfide mine in Minnesota, and is by far the most controversial mine proposal in the state's history. The SDEIS fuels that contention by disclosing that hundreds of millions of dollars will be required to prevent severe water pollution, with water treatment required for hundreds of years at least, and then proclaiming that all details of the financial assurance will be provided later, outside of the NEPA process. How a new, inexperienced mining company of few employees or assets can be expected to provide hundreds of millions to billions of dollars in financial assurance – to prevent severe pollution in the decades to centuries after the mine is closed and the mining company no longer exists – is one of the most critical issues for this proposal and yet is not addressed in the SDEIS.

Furthermore, the uncertainty of the effectiveness of many of the mitigation measures results in additional uncertainty regarding the amount of financial assurance that will be needed, and the efficacy of the attempt to address future mitigation failures through financial assurance. In several places, the SDEIS promises “adaptive management” to address any changes that become necessary due to errors in the SDEIS predictions. The need for some of these changes would not be known until long after the mine has closed and PolyMet Corporation no longer exists. It seems unlikely that financial assurance will be in place to cover these adaptations.

For example, the quality of water in the West Pit lake and in the East Pit wetland pore water is uncertain. Experience at other mines indicates that groundwater quality in mined-out areas, including backfilled areas, is often far worse than predicted in the project's EIS. At the Flambeau Mine in Wisconsin, the leachate in the backfilled mine pit was predicted to be 0.725 mg/L manganese; actual levels have been as high as 37 mg/L. Kuipers, *et al.*, Comparison of Predicted and Actual Water Quality at Hardrock Mines (2006) (Ex. 27) at 166. The reality is that PolyMet and the Co-Lead Agencies cannot predict with any certainty what the water quality in the pits will be. Given the lack of

knowledge of site hydrology, they also cannot know what volume of water will need to be treated after closure.

The SDEIS states, “The objective of treating the West Pit water would be to manage water quality within the pit prior to groundwater outflow from the pit lake via the surficial aquifer. The WWTF could be expanded or treatment capabilities modified if required to meet water resource objectives during this time.” SDEIS 3-72. This would likely be many years after the mine closes. The question is: where would the money for this adaptive management come from?

Similarly, adaptive management to mitigate unexpected sulfate levels discharging to the Partridge River is discussed at SDEIS 5-143 to -144. The discussion suggests that monitoring sulfate levels in groundwater downgradient from the mine features will allow for adaptive measures to ensure that water quality standards are met. However, predictions of groundwater travel time do not have the plume reaching groundwater monitoring points until decades into the future. Table 5.2.2-21, SDEIS 5-106, indicates that peak concentrations of pollutants are not expected to reach the groundwater evaluation point for more than 100 years for several of the mine features. While we do not believe these predictions are accurate, they do inform the other predictions and promises in the SDEIS. One hundred years after the mine closes, who exactly is it that will provide the money to implement these adaptive management measures?

The SDEIS is rife with similar examples, too numerous to detail. All of these mitigation measures are hollow promises without any information on how they would be paid for. In fact, the scant information the SDEIS does give us regarding financial assurance includes the statement that funding for unexpected contingencies “would not be initially included in the financial assurance package, but, if required in the future, these measures would be added.” SDEIS 5-215. Because the need for many of these measures might not be known until after the mine has closed and PolyMet no longer exists, it cannot be assumed that money would then be available.

After many years of analyzing PolyMet’s proposal, the agencies claim that the information required to calculate financial assurance amounts is still unavailable. But clearly this critically important information is necessary before the decisionmakers can make a reasoned decision concerning this proposal. NEPA specifically requires that “information [be] available to public officials and citizens before decisions are made and before actions are taken.” 40 C.F.R. § 1500.1(b). Because information concerning financial assurance is directly relevant to the reasonably foreseeable significant adverse impacts of the proposed mine, and is essential to a reasoned choice among alternatives, and because the overall cost of obtaining such information is not “exorbitant,” NEPA requires the agencies to include this information in the SDEIS. 40 C.F.R. § 1502.22(a).

Moreover, even if the agencies could demonstrate that detailed information concerning financial assurance cannot yet be obtained, the agencies are still required to include in the SDEIS a statement of the relevance of the incomplete or unavailable information to evaluating the impacts of the proposal, a summary of the information that

is available, and the agency's evaluation of the potential impacts "based upon theoretical approaches or research methods generally accepted in the scientific community." 40 C.F.R. § 1502.22(b).

Essentially, the agencies have punted on this contentious issue by postponing any meaningful discussion of the details of financial assurance until the DNR considers PolyMet's Permit to Mine. SDEIS 3-136. NEPA, however, does not allow federal agencies to postpone the consideration of important, relevant factors, or to defer to other permitting processes, especially those of state agencies. See *South Fork Band Council of Western Shoshone of Nevada v. U.S. Dept. of the Interior*, 588 F.3d 718, 726 (9th Cir. 2009).

G. *The SDEIS Fails to Adequately Address the Pumping of Water from the East Pit*

The SDEIS states that during mining, the East Pit would be dewatered. SDEIS 5-102. In approximately year 10, the mining of the East Pit is expected to be completed, and PolyMet proposes backfilling of the East Pit with waste rock from the West Pit. *Id.* PolyMet will then rely on natural groundwater inflow to the East Pit to saturate the waste rock in the backfill. *Id.*

According to PolyMet's reclamation proposal, during years 22 to 31, PolyMet proposes to pump water out of the East Pit backfill for treatment in the WWTF at 1750 gpm. See PolyMet 2013i at 154. This appears to contradict the information in the SDEIS regarding the East Pit. This is a large amount of water to be pumped and treated, and it appears that it could impact saturation of the waste rock in the East Pit backfill.

The agencies must more adequately explain PolyMet's plans for the pumping of water at the East Pit at all phases of the mine project, including reclamation and post-closure. The additional discussion and analysis must address the feasibility and likelihood of success of PolyMet's proposal, and the impacts of the pumping on the waste rock that would be backfilled in the East Pit.

H. *The SDEIS Does Not Sufficiently Assess Impacts to the Flow of Rivers and Streams, or Explain Mitigation Measures to Protect Them*

According to the SDEIS, both the Partridge River and the Embarrass River tributaries will lose flow due to this project. To reiterate points made in other sections of these comments, the amount of drawdown in the Partridge River is likely to be underestimated due to inaccuracy in the modeling, and drawdown of the upper reaches of the Embarrass River tributaries has not been addressed at all. PolyMet apparently does plan to discharge water directly to the channel of Unnamed Creek to maintain its flow immediately below the tailings basin. However, the fate of this water is uncertain; drawdown of the water table may cause the stream to lose most of the augmented flow to groundwater. The entire upper reach of the creek is currently lined by riparian wetlands; it is unclear whether the proposed augmentation will be sufficient to support the wetlands

as well as the creek flow. As with Trimble and Mud Lake Creeks, discussion of the augmentation plan does not disclose the likely impacts to hydrology in the first mile below the tailings basin. Finally, the SDEIS also does not disclose the predicted drawdown at SW-003 on the Partridge River.

The SDEIS concludes that neither the Partridge River nor Embarrass River tributaries would be significantly impacted by the Proposed Project. In addition to the above issues, this conclusion is unsupported by adequate information in the SDEIS in several other ways.

To mitigate the loss of seepage from the tailings basin to Embarrass River tributaries, PolyMet plans to augment flows to within twenty percent of their current level. The SDEIS concludes that this is sufficiently protective because twenty percent is within the range of natural variation in precipitation. The SDEIS provides no details as to the flow augmentation regime, or at what point the decision would be made to increase the augmentation. However, the point must be made that a twenty percent reduction in low flow is in many cases not within the range of natural variation. Low flows occur when there is little or no precipitation. While in wetter years a higher water table may contribute more groundwater than in drier years, the assumption that a twenty percent drawdown in the baseflow of a stream is equivalent to a twenty percent variation in annual precipitation is a misuse of statistics. Furthermore, if the reduction in baseflow is measured by an average or mean measurement over the course of several years, it can be expected to fall at the median in regards to precipitation. This would mean that a twenty percent reduction from that median represents a forty percent variation in precipitation. Finally, a permanent drop in baseflow of twenty percent is not equivalent to a baseflow that drops by twenty percent in drought years.

NEPA requires agencies to consider means to mitigate adverse environmental impacts. 40 C.F.R. § 1502.16(h); *see also* 40 C.F.R. § 1502.14(f); 40 C.F.R. § 1505.2(c). Without more information on the flow augmentation plan, it is impossible to tell whether and to what degree the adverse impacts of this project on the headwaters of the Embarrass River tributaries will be mitigated.

The SDEIS also does not provide any scientific reference for the proposition that a twenty percent reduction in the flow of a stream would not result in significant effects on the aquatic community. *See* 40 C.F.R. § 1502.24 (agencies “shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement”); *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1150 (9th Cir. 1998) (“NEPA requires that the public receive the underlying environmental data from which [an agency] expert derived her opinion”). The conclusion that augmenting flows to within twenty percent of current conditions is sufficient to protect aquatic life is thus unsubstantiated.

Furthermore, the SDEIS provides virtually no information about monitoring or maintaining the variation in flow to maintain natural conditions. The statement that “Effects on the success of fish spawning in tributary streams would be addressed by

maintenance of seasonal, bankfull flows over the life of the NorthMet Project Proposed Action,” SEDIS 5-391, seems to be the only mention of maintaining seasonal variation in either watershed. Just how this will happen in light of the lack of a monitoring plan remains a mystery.

We were unable to locate a mitigation plan for greater-than-expected drawdown in the flow of the Partridge River. The SDEIS seems to provide no information on the point at which action may need to be taken to avoid impacts. However, the plan does anticipate allowing baseflow to drop gradually by a predicted 4 to 7 percent during the first eleven years. SDEIS 5-381. At what point would a decision be made to augment or take some other action to protect the flow? If PolyMet would not be required to take action until the baseflow has dropped by twenty percent, that is unacceptable for the same reasons that apply to the Embarrass tributaries.

Although the SDEIS is unclear on this point as well, the drawdown metric for the Partridge River would apparently be based on modeled rather than measured data. See SDEIS 5-381. The modeled data shows a significantly lower base flow than indicated by empirical measurements. If the drawdown metric is based on modeling data, the river will likely be drawn down far more than twenty percent before mitigation measures are required. The SDEIS should reveal the ultimate levels to which flow would be allowed to drop before mitigation is required.

The scant information given on monitoring indicates the likelihood that whatever the loss of flow in either the Partridge River or the Embarrass tributaries, nothing is likely to be done about it. According to Table 5.2.2-53, SDEIS 5-219, flow monitoring for the Partridge River will be done “at/near SW-004a and SW-006.” Monitoring at these locations is unlikely to reveal the impact on flows upstream. The greatest predicted drawdown to baseflows is at SW-004 (noting again that SW-003 was apparently not modeled). A reduction in flow at SW-002 is also predicted; this point is miles upstream from SW-004a. PolyMet must be required to monitor the flow at each of these locations, with a mitigation plan that reveals at what point action would be required, and what that action would be. Hydrology at the site is simply too uncertain to allow the conclusion that drawdown of the river will not be significant.

The entire SDEIS is silent in regards to any impacts on or monitoring of Yelp Creek. As explained, it appears that this project will have an impact on the hydrology that supports Yelp Creek. This impact must be discussed in the SDEIS, and a monitoring and mitigation plan proposed to protect this creek.

The apparent flow monitoring plan for the Embarrass River and its tributaries is even worse than that for the Partridge River. SDEIS Table 5.2.2-54 reveals that flow monitoring will occur “at/near PM-13 and PM-12.” PM-12 is presumed to be upstream of any impacts, and PM-13 is four to five miles down-gradient of the tailings basin as the crow flies, and nowhere near any of the tributary streams. The SDEIS conclusions as to impacts on these streams are not believable in light of the apparent lack of any plan to monitor them. Nor would this situation be corrected by a decision to monitor the streams

at the first evaluation points used in baseline monitoring and modeling. Each of these points occurs at or near the property line, which would still leave more than a mile stretch of each tributary stream unprotected. The SDEIS must provide an assessment of and a monitoring and mitigation plan for stream flow in the upper reaches of the Embarrass tributary streams.

I. Groundwater Flow Paths are Inadequately Characterized and Appear to be Inaccurate, Casting Doubt on Conclusions Regarding Impacts

The groundwater flow path discussion that purports to address all of the areas where contaminated groundwater could flow into wetlands and streams ignores several areas where outflow is likely. Some of these areas are dismissed out-of-hand, with no supporting rationale, and others do not provide enough detail to determine whether they are accurate.

1. Conclusions About Groundwater Flow to the East and South of the Tailings Basin are not Adequately Supported and Appear to be Incorrect.

Predicted groundwater flow paths for the movement of contaminated groundwater from the tailings basin are found in SDEIS Figure 5.2.2-6. An inferred groundwater elevation contour map is found in SDEIS Figure 4.2.2-6. Figure 4.2.2-12 shows depth to bedrock, but it is unclear what this map is based on. Figure 4.2.14-2 provides the only existing topographic information we were able to locate. We were unable to locate a figure that shows proposed changes in topography at the tailings basin. These figures do not provide adequate support for the conclusory statements in the SDEIS that groundwater would not seep from the tailings basin to Spring Mine Creek or Second Creek and/or their upstream wetlands pursuant to the Proposed Project. See 40 C.F.R. § 1502.24.

a. The Assumption that Tailings Basin Water Will Not Flow Toward Spring Mine Creek is Unsubstantiated

The SDEIS states that no water will flow to the east from the Tailings Basin because of high bedrock. SDEIS 3-117 and 4-99. However, all of the information presented in the SDEIS shows a break in the high bedrock in the area that forms the headwaters of both Spring Mine and Mud Lake Creeks. The Depth to Bedrock Figure, SDEIS Fig. 4.2.2-15, indicates that the depth to bedrock at this location is actually greater than it is around the north and west sides of the Tailings Basin.

Based on satellite imagery, see Exhibit 34, and the wetland delineation map, SDEIS Figure 4.2.3-1, this area appears to consist of a string of wetlands and open water. It is difficult to discern the direction of flow, although possibly the roads and railroad tracks that cross the area currently act as the surface watershed divide. The groundwater flow pattern in this area is simply unknown. The SDEIS must make clear why, after years of work on this proposal, such directly relevant information remains unavailable. 40 C.F.R. § 1502.22.

Based on the information that is available, the groundwater elevation contours shown on Fig. 4.2.2-6 are not believable at this location. First, according to the text the elevations were determined from water level measurements in fifteen wells, as shown on Fig. 4.2.2-13. SDEIS 4-99. Figure 4.2.2-13 indicates that there are no groundwater wells on the entire east side of the tailings basin, including not only the Spring Mine Creek watershed but the Mud Lake Creek watershed as well. The SDEIS provides no information as to the basis of the contour map in this entire area.

Furthermore, some of the elevation contours cannot be correct. The highest surface elevation contour between Cell 1E and the Spring Mine Creek watershed shown on Figure 4.2.14-2 appears to be about 1635 feet AMSL (although the figure is admittedly incomplete and difficult-to-read). This line is located directly below the location of the planned outflow swale. The groundwater elevation shown on Figure 4.2.2-6 at the same location is between 1700 and 1725 feet AMSL. Obviously this is wrong. Also, the map shows Spring Mine Lake at an elevation of 1775 ft (assuming that the groundwater elevation is no higher than the lake surface), while reference websites give an elevation of approximately 1676 feet. See, e.g., www.geonames.org.

The Proposed Project plan is to raise Cell 1E to 1735 feet AMSL, with ponded water at the top. SDEIS 3-102. It seems likely that the presence of bedrock at above that elevation to the north and south will send a large volume of water through this opening. This is likely to come in the form of contaminated groundwater seepage as well as surface seepage and outflow from the pond. While PolyMet may be able to direct surface flow into the constructed swale, the SDEIS provides no explanation of why groundwater seepage will not flow to Spring Mine Creek.

The SDEIS does reveal, however, that Spring Mine Creek is already impacted by an LTV mine pit, SDEIS 6-9, and a downstream reach is on the 303(d) Impaired Waters List for Fishes and Macroinvertebrates Bioassessments, SDEIS 4-29. To comply with NEPA and to demonstrate compliance with federal and state discharge requirements, the potential for discharge to Spring Mine Creek must be assessed and disclosed in the SDEIS using accurate mapping and real data.

b. The Assumption that All Water Seeping from the South End of the Tailings Basin will be Collected is Unsupported

The SDEIS is even more lacking in information on hydrology at the south end of the tailings basin, which forms the headwaters of Second Creek. The text makes the statement that “Along the southern side, surface features result in all seepage emerging at a surface seep.” SDEIS 3-117. No explanation is given as to why or how the surface features prevent groundwater seepage and movement through this area, and none of the figures provide enough detail to show how much of the area consists of bedrock outcrop or what the likely hydrological regime might be. It appears that no monitoring has been done in this area, see SDEIS Figure 4.2.2-13, and the groundwater elevation contour map is completely lacking in detail. See Figure 4.2.2-6. On satellite imagery the area appears

to be dotted with small waste rock or overburden stockpiles from the LTV mine, and no conclusions can be drawn regarding the presence of bedrock or other barriers to groundwater movement.

The SDEIS states that “A cutoff berm and trench placed approximately 200 to 250 feet downstream of the seepage face would collect this seepage.” However, there is no figure illustrating either the placement or the construction of this berm and trench. The SDEIS simply does not include sufficient information on which to base a conclusion that groundwater will not flow away from the tailings basin to the south.

2. The Assumption that Yelp Creek and the Partridge River Above SW-003 Will Not be Impacted Appears Incorrect

According to the SDEIS, eighty percent of the Mine Site currently drains to the south, while twenty percent “drains north to the One Hundred Mile Swamp and the Partridge River or northeast to the Partridge River.” SDEIS 4-151. The assessment of impacts completely ignores that twenty percent, with no explanation for the omission.

We were unable to locate a topographic map of the site in the SDEIS materials. A map of estimated groundwater contours is included as SDEIS Figure 4.2.2-5. According to this map, groundwater levels are essentially flat in the area of the proposed Category 1 Stockpile and Yelp Creek. The map does not support an interpretation that water does not flow toward Yelp Creek from the stockpile area.

Although PolyMet proposes to capture drainage from the stockpile, the SDEIS claims that the capture system is assumed to be ninety percent successful, which leaves ten percent of the drainage to flow into the environment. This is almost certainly an overly optimistic prediction, and the SDEIS provides no support for it based on past experience with this type of system. Minnesota Center for Environmental Advocacy is submitting comments on the likely efficacy of this system, which are incorporated here by reference.

Whatever the rate of flow would be, the SDEIS and the modeling apparently assume that all of this flow will be toward the West Pit. The information provided does not support this assumption. To begin with, in the earliest years of mine operation the West Pit will not yet exist in the area to the south of the stockpile. SDEIS Figure 3.2-6. After the pit does exist, the north edge of the pile would be much closer to Yelp Creek than to the West Pit. While we completely disagree with assumptions about hydraulic conductivity at the site, if those assumptions are correct water that escapes the collection system on the north side of the Category 1 Stockpile seem much more likely to gravitate toward Yelp Creek than toward the West Pit. Finally, after closure the West Pit will no longer draw groundwater to the degree that it will during active mining, but the Stockpile will continue producing contaminated drainage for an indeterminate amount of time. It cannot be assumed based on the available information that this drainage will not impact wetlands and Yelp Creek.

Similarly, it appears from the groundwater contour map that water from the East Pit is likely to enter the Partridge River above SW-003. The SDEIS insinuates as much when it states, “The dike located north of the East Pit would remain in place to minimize mixing of the Partridge River flows with the East Pit water.” SDEIS 3-71. The text does not explain how the dike will prevent the outflow of groundwater in that direction, and the subject is not mentioned again in the assessment of impacts.

As discussed above, the water quality impacts of the Proposed Project have not been assessed for this entire stretch of river – from Yelp Creek to SW-004. Rather, the model assumed that SW-003 would be unimpacted and that most groundwater inputs from the mine site would occur prior to SW-004. While this is valid for the purpose of comparing background water quality to impacted water quality at SW-004, it is not valid for assessing impacts on the rest of the river.

J. The Assessment of Impacts to Wetlands is Inadequate

The Organizations are submitting comments on the Section 404 permit application to the U.S. Army Corps of Engineers under separate cover. Comments below are limited to erroneous, missing, or inadequate information in the SDEIS. The proposed project’s failures to meet the requirements of state law (other than failure to disclose sufficient information for the assessment of impacts) will be addressed in comments on the permit to mine application, should one be submitted.

The Great Lakes Indian Fish and Wildlife Commission (GLIFWC) has objected to several of the methods and conclusions presented in the SDEIS, and these comments are included in Appendix C. We agree with the GLIFWC position and incorporate the “GLIFWC Wetlands Attachment” by reference. This includes (but is not limited to) the points that:

- Groundwater drawdown is likely to result in impacts on ombotrophic bogs, and these impacts must be included in the SDEIS.
- Hydrogeological studies at the mine site are insufficient to support SDEIS assumptions regarding hydrological connections between groundwater and many of the wetlands.
- Use of the Canisteo Pit as an analog must be adjusted to account for the difference in depth of the NorthMet pit, and this assessment must use relevant information from other mine pits.
- The amount of acreage likely to be impacted, and the acreage likely to be severely or moderately impacted, are all higher than suggested in the SDEIS.
- Significant drawdown of the Partridge River is possible, which would in turn impact riparian wetlands.
- PolyMet needs to provide sufficient information to allow assessment of the quantity of wetlands that will be impacted.

In addition to these points, the SDEIS wetlands assessment is deficient in the following ways.

1. The SDEIS Discussion of Wetland Impacts Fails to Identify Specific Wetland Functions That Will Be Lost

As the SDEIS states, “Wetlands can serve many functions, including groundwater recharge/discharge, flood storage and alteration/attenuation, nutrient and sediment removal/transformation, toxicant retention, fish and wildlife habitat, wildlife diversity/abundance for breeding migration and wintering, shoreline stabilization, production export, aquatic diversity/abundance, vegetative diversity/integrity, and support of recreational activities.” SDEIS 4-156. The SDEIS explains the use of MnRAM to assess wetland functions, including a list of factors used in the assessment. However, the wetland discussion does not provide information on which functions provided by the wetlands will be destroyed or degraded by this project. As a result, it is impossible to judge whether the functions that will be lost will be replaced by mitigation. The discussion of mitigation focuses only on the quality and type of wetland, and ignores function.

The U.S. Forest Service (USFS) Land Exchange section does provide a table showing “Wetland Functions and Values Assessment for the Federal Lands Surrounding the Mine Site.” Table 4.3.3-2, SDEIS 4-436. This table is from the reference document AECOM 2011a, which includes MnRAM documentation only for the Federal Lands outside of the Mine Site itself, which were apparently assessed separately from the Mine Site lands. We were unable to find MnRAM documentation for wetlands within the Mine Site, which of course is where the greatest impact will be. The AECOM documents reference the document “Barr Engineering Company. 2007. Wetlands in the USFS Land Exchange Area. Memorandum dated 29 November 2007. Prepared for PolyMet Mining Company, Hoyt Lakes, Minnesota. Minneapolis, Minnesota.” This document does not seem to be included in the SDEIS reference material.

Table 4.3.3-2 was apparently included in order to compare the functions of the lands that will be lost to the federal estate to functions that exist on the property that will be gained by the federal estate. The accompanying discussion does not actually assess the functions that will be lost to the Partridge and St. Louis River watersheds. Such an assessment must be included in the wetland impacts section of the SDEIS, accompanied by an assessment of the degree to which the loss of those functions will be replaced by the proposed mitigation.

2. The SDEIS Does Not Assess Wetland Water Quality Impacts

The only information in the SDEIS on current water quality in wetlands is for mercury in reference wetlands north of the tailings basin. See Table 4.2.2-4, SDEIS 4-42. Apparently no baseline data regarding water quality in the Mine Site or Plant Site wetlands has been gathered.

Minnesota’s Class 2B water quality standards apply to wetlands. The wetlands at issue here are classified as Class 2D waters. Minn. R. 7050.0425, .0186(1a)(B). The

numeric standards for Class 2B waters apply to Class 2D waters. Minn. R. 7050.0222(6). Rule 7050.0222(6) explicitly applies to wetlands, Minn. R. 7050.186(1); in addition, the rules direct that “[t]he quality of wetlands shall be maintained to permit the propagation and maintenance of a healthy community of aquatic and terrestrial species indigenous to wetlands, preserve wildlife habitat, and support biological diversity of the landscape.” *Id.*

The SDEIS provides no quantitative predictions regarding water quality impacts in the wetlands. It does state an assumption that water quality will change, but it does not discuss the potential degree of change or the consequences of those changes. Instead, it promises “consideration in future monitoring.” SDEIS 5-283. Also, the SDEIS separately discusses air deposition, railroad spillage, and groundwater transport, but does not discuss the additive effect of pollution from all three sources. As explained below, significant changes in water quality are likely, to the point of violating water quality standards. These impacts must be disclosed and discussed in the SDEIS.

a. The Proposed Project Would Add Mercury to Wetland Waters

The SDEIS discusses the potential for air deposition of metals and sulfate, and groundwater contamination by the 28 modeled solutes, to impact wetland water quality. The inadequacy of this discussion in regards to other metals and sulfate is addressed below. The point here is that this analysis ignores mercury altogether. Neither the impacts of mercury deposition in wetlands nor the addition of mercury to groundwater flow through wetlands is assessed in the SDEIS.

The SDEIS does not include information on current mercury levels in water in the wetlands that would be impacted, particularly at the mine site, but the information that it does include indicates that wetlands almost certainly already violate the applicable mercury water quality standard of 1.3 ng/L. Both the Partridge and the Embarrass Rivers already violate the numeric water column standard for mercury, as do many of the Embarrass River tributaries; the only reason that they do not appear on the 303(d) Impaired Waters list for mercury in fish tissue is because they have not been assessed. All downstream lakes and river reaches that have been assessed are listed as impaired on that basis. Two wetlands tested for background purposes have a mean water quality level of 2.2 and 3.6 ng/L. Table 4.2.2-4, SDEIS 4-42. In the absence of site-specific information, it must be assumed that wetland waters do not meet the numeric standard.

The SDEIS states the assumption that the release of constituents into groundwater will impact water quality in wetlands. In regards to the mine site,

Water quality modeling results indicate groundwater quality along each flowpath would likely change from existing conditions. It was conservatively assumed that these changes may cause potential indirect effects to the character, function, and quality of minerotrophic wetlands; therefore, it was also assumed that all downgradient minerotrophic wetlands located within the five Mine Site surficial aquifer flowpaths may have potential indirect wetland effects related to water quality changes as a result of leakage/seepage from mine features (PolyMet

2013b). This analysis indicates areas that can be conservatively assumed to have potential indirect effects due to changes in groundwater quality.

SDEIS 5-283. At the Plant Site, Table 5.2.3-13 lists the wetland acres that could be affected by ground and/or surface water quality as 4,638 acres. SDEIS 5-307.

As explained above, leachate that discharges to the groundwater flow paths from waste rock stockpiles, the East Pit (which will be filled with waste rock), the Overburden Storage and Laydown Area, and the Tailings Basin is virtually certain to have a mercury level above 1.3 ng/L, and mercury from the waste rock, peat, and tailings will contribute to that level. Since the SDEIS assumes that changes in groundwater quality may effect wetland water quality, and since the groundwater will include mercury released from mining features, the only possible conclusion is that the project will add to mercury levels in the wetlands, which already exceed the water quality standard.

In addition, as discussed above the level of water quality impacts in general as assessed in the SDEIS is based on a flawed model that most likely seriously underestimates the flow of groundwater. This underestimated flow could significantly affect the prediction of mercury increases in wetlands, particularly from the Overburden Stockpile and Laydown Area, the Category 1 Waste Rock Stockpile, and the East Pit. Similarly, the SDEIS is unrealistically optimistic about the amount of Tailings Basin seepage that will be collected, and the amount of mercury from that source is also likely to be greater than might be supposed based on the SDEIS.

Mercury levels in wetland waters are also likely to increase due to mercury in fugitive dust and Plant emissions. As discussed above, fugitive dust and emissions from the Plant will increase the mercury load to the Embarrass and Partridge Rivers; this is even more the case for wetlands, as they are closer to the emissions sources and will receive the majority of inputs by direct deposition rather than via runoff. Finally, the mine project includes a plan to discharge Colby Lake water, which is high in mercury, into wetlands and headwaters immediately below the Tailings Basin.

The release of mercury to wetlands may be more problematic than direct releases to rivers or lakes, as wetlands appear to be where most mercury methylation occurs. The concurrent addition of sulfates (discussed below) and the likelihood of water level fluctuations contribute to the problem. The SDEIS must assess the total additional load of mercury to wetlands from all sources (air deposition, groundwater transport, and spillage) and the impact it will have both on the violations of the water quality standard and the mercury level in downstream fish. It should be noted that the 1.3 ng/L standard is set to protect wildlife that feed on fish and other aquatic life, and thus the assessment should not be limited to impacts on humans who eat fish from the downstream lakes.

b. The Proposed Project Would Result in Violations of Other Water Quality Standards

In addition to mercury, the Proposed Project would likely result in violations of other water quality standards in wetlands, due to both groundwater contamination and air deposition of sulfur and metals. Although the SDEIS states an assumption that wetland water quality may be impacted by these sources, it provides no assessment of what those impacts might be. And although it provides some predictions (however incomplete) regarding groundwater quality at the property line, the Partridge River, and the Embarrass River and its tributaries, it provides no information on groundwater quality where it may first surface to wetlands.

The SDEIS does not fully describe its groundwater quality predictions in regards to the depth at which the pollution is likely to be found, whether the entire flow path is likely to be affected or whether we can expect a narrower plume of contamination, etc. According to the Wetland Data Package,

The amount of groundwater discharge to surface water and wetlands between the mine features and the Partridge River is expected to be minimal relative to the amount of groundwater discharge to the Partridge River itself. Significant quantities of groundwater are not expected to discharge to the wetlands because of the very low hydraulic conductivities of the underlying peat layers, as cited in Section 5.2.1.2.2. In the water quality model, it is assumed that the leakage/seepage from mine features discharges to the Partridge River; there is assumed to be no groundwater discharge to surface water or wetlands along intermediate portions of the flow paths (Reference (12)). Therefore, the water quality model cannot be used to quantify the amount of leakage/seepage from mine features that discharges directly to individual wetlands.

PolyMet 2013b at 40.

However, not all of the wetlands have underlying peat layers, and Section 5.2.1.2.2 also discusses the wide range of hydraulic conductivities at the site. In addition, in the context of impacts from drawdown, Section 5.2.1.2.2 reveals that within 1,000 feet of the pits, impacts are likely even to peat wetlands. In short, the SDEIS and its reference material do not provide support for the assertion that “significant quantities of groundwater are not expected to discharge to the wetlands.” Mineotrophic wetlands form when the groundwater level approaches the land surface for a significant portion of the year. In essence, water in these systems *is* groundwater. In the absence of adequate rationale for the assumption that groundwater flowing from the mine features would not enter these wetlands, it must be assumed that contamination would impact all wetlands that are hydrologically connected to groundwater in each flow path.

The Wetlands Data Package suggests using the evaluation locations for the Dunka Road to assess potential water quality impacts to wetlands:

The water quality model includes groundwater quality evaluation locations within the surficial aquifer and located along the Dunka Road for each of the groundwater flow paths. These evaluation locations are within the PolyMet property boundary, typically within close proximity of the mine features and are located up gradient of most of the groundwater-fed wetlands at the Mine Site. Thus, results of the water quality modeling within these flow paths can be used to evaluate groundwater quality that could flow to down gradient groundwater fed wetlands.

Id. Neither the SDEIS nor the Wetlands Data Package provides the water quality predictions for those locations, however; that information is found in Attachment J of the Water Modeling Data Package Vol. I (PolyMet 2013i). As explained above, the Class 2B standards apply to wetlands. The following table shows the approximate P90 predictions of groundwater quality at the Dunka Road for several flow paths, as compared to the Class 2B standards. Standards that vary based on hardness are given for a hardness of 100 mg/L. All values are ug/L.

Pollutant	Class 2B Standard	East Pit Cat. 2/3	Ore Surge Pile	WWTF	OSLA	West Pit
Aluminum	125	420	200	165	170	
Cobalt	5.0	13	9.0			53
Cadmium	2.5				3.0	
Lead	3.2					8.2

The values in the table above do not refer to the leachate from the various sources. Rather, they reflect very significant dilution by other groundwater. In fact, it is entirely unclear from the discussion in the SDEIS, the Water Modeling Data Package, and the Wetland Data Package that these values do not actually reflect the predicted quality of water in groundwater-supported wetlands at the Dunka Road.

The concentrations of these and other constituents in leachate from some mine features will be several orders of magnitude greater than the predicted water quality at Dunka Rd. Thus if anything does not go as planned (for instance, if the liners leak more than expected, if outflow from the pits is greater than expected, if waste rock is not sorted as accurately as expected, if flooding temporarily overcomes the leachate collection system, etc.) pollutant levels in water discharged to wetlands could be far higher than these predictions. We have particular concerns about pollutants (such as copper and nickel) for which predictions are based on concentration caps and adsorption rates. The leachate for these pollutants is expected to be extremely concentrated, and we do not believe that the predictions accurately reflect the potential for releases to groundwater

and wetlands. The following table shows leachate levels, which are limited to those that are included in Attachment H of the Water Modeling Data Package Vol. 1 (PolyMet 2013i). Once again, all values shown are approximate P90 predictions in ug/L. Standards that vary based on hardness are given for a hardness of 100 mg/L.

Pollutant	Class 2B Standard	Cat. 2/3 Stockpile	Ore Surge Pile	Cat. 1 Stockpile	East Pit Porewater	West Pit Year 40
Aluminum	125	800,000	820,000			
Antimony	31	2,400	2,600	90	86	
Arsenic	53	100	100	100	100	
Cadmium	2.5	200	210	8.0	32	3.8
Cobalt	5.0	24,000	40,000	320	1,600	70
Copper	9.3	165,000	165,000	660	12,800	650
Lead	3.2	550	550	100		26
Nickel	52	350,000	820,000	6,600	30,000	800
Selenium	5.0	130	160	70	90	
Silver	1.0	48	48			
Thallium	0.56	9.8	30			
Zinc	120	20,000	26,000	390	1,600	230

It is clear from this table that the potential for water quality violations in wetlands surrounding the stockpiles and pits is significant. While the values given for the Category 1 Stockpile and the pit water are not as high as those for the temporary sources, some of the constituents will remain many times higher than the standard for more than 200 years, which was the extent of the modeling period. Also, a larger quantity of water is predicted to enter the groundwater system from the pits than from the other sources on this table. The East Pit is located at a greater distance from Dunka Road, and significant wetlands lie between the two. See SDEIS Figure 5.2.3-1. Thus the use of the Dunka Road evaluation location may not capture potential exceedances of the standards for those wetlands.

The SDEIS completely ignores potential impacts to the wetlands between the Category 1 Stockpile and Yelp Creek. If the water collection system is not 100 percent effective, Category 1 Stockpile leachate is likely to travel in that direction. East Pit porewater is also likely to travel north and east into adjacent wetlands. These areas need to be included in an assessment of water quality impacts on wetlands.

Discharge from the Tailings Basin is also likely to result in water quality standard violations. The SDEIS assumes that more than 99 percent of the Tailings Basin seepage will be collected by the water collection system. For reasons given in the comments of other parties, particularly the Minnesota Center for Environmental Advocacy and Water Legacy, it is highly unlikely that the collection system will be as effective as the SDEIS predicts. A greater volume of water is likely to enter wetlands and headwaters through groundwater, and that water is likely to mix with wetland and other surface water much more quickly than the SDEIS predicts.

The SDEIS further assumes that 100 percent of the seepage from the south wall of the tailings basin will be collected, and will not enter Second Creek and its associated wetlands. No details are given regarding the water collection system or the hydrology or surface features of the area. At the very least, the SDEIS needs to provide adequate support for the assumption that seepage will not affect wetland water quality in this area.

Finally, the SDEIS does not address the potential for seepage from the east side of the Tailings Basin and the potential that it will drain to Spring Mine Creek. Although most of the east side consists of higher elevation bedrock, a break in the bedrock provides an opening toward Spring Mine Creek. This entire area appears to consist of wetlands that currently drain toward the Tailings Basin. However, the east side of the Tailings Basin will gain significant elevation from the NorthMet project, which will result in a reversal of the drainage. Significant seepage is likely, and no collection is planned.

The PolyMet materials do not include predictions for seepage at the east side of the Tailings Basin, but predictions for water quality at the North, Northwest, West, and South toes indicate approximate water quality, shown in the following table. The values are approximate maximum P90 values, in ug/L. Values for standards that vary by hardness are given for a hardness of 100 mg/L.

Pollutant	2B Standard	North Toe	Northwest Toe	South Toe	West Toe
Cobalt	5.0	82	35	128	16
Copper	9.3	690	360	680	180
Nickel	52	1200	600	1700	200
Lead	3.2	64	26	76	15
Zinc	120	250	170	290	

See Water Modeling Data Package Vol. 2 (PolyMet 2013j), Attachment F. As is clear from this table, if sufficient water escapes collection the water quality standards will be exceeded in wetlands immediately below the tailings basin. This seems particularly inevitable on the east side, where seepage is likely to affect Spring Mine Creek as well as wetlands.

At both the Mine Site and the Plant Site, fugitive dust and emissions from the plant will add pollutants to those released to wetlands through groundwater. The inadequacy of the air deposition analysis is addressed above. The SDEIS must assess the combined impacts of groundwater transport, air deposition, and spillage on wetlands water quality to meet the requirements of NEPA and MEPA.

c. The Proposed Project Would Increase Sulfate Levels in Wetlands.

In addition to degradation evidenced by potential water quality standard violations described above, the Proposed Project would release additional sulfate into wetlands. Currently, a 10 mg/L sulfate water quality standard applies only to waters that produce

wild rice. It is becoming increasingly clear, however, that a much lower standard is needed, and that standard will need to be applied throughout the system. This is necessary to reduce the sulfate levels downstream, to reduce the impacts of hydrogen sulfide to the entire system, and to reduce the amount of mercury in fish tissue to safe levels. In a similar situation stemming from mercury, sulfates, and vast expanses of wetlands in the Florida Everglades, the EPA has set a target discharge level of 1 mg/L sulfate. Scheidt, D.J., and P.I. Kalla, Everglades ecosystem assessment: water management and quality, eutrophication, mercury contamination, soils and habitat: monitoring for adaptive management: a R-EMAP status report. USEPA Region 4 (2007) (Ex. 5). In Minnesota, the natural background level appears to be about 3 mg/L, and it is likely that *any* anthropogenic sources that add to that level create a problem.

All waters within the St. Louis River system that have been tested for fish tissue mercury levels are on the 303(d) Impaired Waters list. Mercury levels are so high that many of these waters will still be impaired even if or when the statewide mercury TMDL is fully implemented. MPCA, “Minnesota Statewide Mercury Total Maximum Daily Load” (March 27, 2007) (Ex. 6). A mercury TMDL is thus still needed for the St. Louis River. An inter-government effort to develop this TMDL was begun by the U.S. EPA, the Minnesota Pollution Control Agency (MPCA), the Wisconsin DNR, and tribal agencies. However, MPCA pulled out of this effort when it became apparent that it was headed toward limiting sulfate discharges throughout the watershed. See Josephine Marcotty, “Minnesota drops out of St. Louis River mercury project” Minneapolis Star Tribune (April 11, 2013), accessed at <http://www.startribune.com/politics/statelocal/202636921.html> on March 10, 2014 (Ex. 7).

In addition, the discharge of sulfates into wetlands can produce hydrogen sulfide, which is toxic to plants and aquatic organisms. Researchers for the Minnesota Pollution Control Agency have recently been assessing hydrogen sulfide as the suspected agent in the decline of wild rice in high sulfate waters. See, e.g., Nathan W. Johnson, “Response of rooting zone geochemistry to experimental manipulation of sulfate levels in Wild Rice mesocosms” (Dec. 31, 2013) (Ex. 8). Professor John Pastor, who is one of the researchers for the wild rice study, was recently quoted in the press as saying “We found there really is no threshold at which sulfide becomes toxic. As soon as you add any, you get a decline in growth rate.” Stephanie Hemphill, “Current sulfate standard is about right to protect wild rice, research indicates,” MinnPost (Feb. 26, 2014), accessed at http://www.minnpost.com/environment/2014/02/current-sulfate-standard-about-right-protect-wild-rice-research-indicates?utm_source=MinnPost+e-mail+newsletters&utm_campaign=d89b9effa5-2_26_2014_Daily_Newsletter2_26_2014&utm_medium=email&utm_term=0_3631302e9c-d89b9effa5-123374190 on March 10, 2014 (Ex. 9). Similarly an article in the Minneapolis Star Tribune reads,

It’s also clear, now, that it’s not just wild rice that suffers from too much sulfate. The toxic reaction that occurs in the muck around the plant’s roots can affect

virtually all types of aquatic flora, or any type of living thing that relies on oxygen, scientists say.

“It’s going to affect everything out there,” said John Pastor, a biologist at the University of Minnesota Duluth, who ran one of the wild rice studies. “It’s going to affect the whole food web.”

Josephine Marcotty, “Research, legal wrangling reap wild rice protections,” Minneapolis Star Tribune (Feb. 26, 2014), accessed at <http://www.startribune.com/lifestyle/health/247183881.html?page=all&prepage=1&c=y#continue> on March 10, 2014 (Ex. 10).

Hydrogen sulfide is toxic not just to plants, but to aquatic life. It can form when sulfates are released to the environment at less than 10 mg/L. As it forms in aquatic environments with organic sediments, sulfate releases to wetland environments are particularly problematic. In addition to the wild rice study material, we are attaching a review of studies of hydrogen sulfide toxicity, Lamers, Leon P.M., *et al.*, “Sulfide as a soil phytotoxin – a review,” 4 Frontiers in Plant Science 268 (July 2013) (Ex. 11).

Hydrogen sulfide is mentioned in the SDEIS only in relation to air emissions. The SDEIS completely ignores the potential for degradation of plant and aquatic life due to the reduction of sulfate to sulfide within the wetland environment. Considering that several streams within the Plant Site are on the impaired waters list for Fishes and Macroinvertebrates Bioassessments, PolyMet and the Co-Lead agencies need to investigate the role of sulfate in the degradation of aquatic communities before permitting any additional releases.

According to the SDEIS, sulfate will not be an issue because the water treatment plant and facility will reduce sulfate to 9 mg/L before discharge to the environment. At this point, it appears that the 9mg/L target is not sufficiently protective of the environment. Furthermore, as with the metals discussed above, high levels of sulfate will leach into wetlands from stockpiles, pits, and the Tailings Basin. Sulfur from air deposition will add to those levels. As with the metals, the SDEIS relies on attenuation and dilution in its predictions regarding sulfate levels in the Partridge and Embarrass Rivers. And as with the metals, the SDEIS does not disclose the levels of sulfate that will discharge to wetlands, far upstream of the surface water evaluation points. As with the metals, the SDEIS relies on a faulty model of the mine site and unrealistically optimistic predictions of the effectiveness of water collection to minimize the amount of contaminated water predicted to escape into groundwater and wetlands from the mine features. And finally, as with the metals, the SDEIS does not reveal the amount of sulfate that will enter the wetlands through air deposition.

The use of the Dunka Road evaluation point for assessing water quality impacts to wetlands is discussed above. The maximum predicted P90 sulfate levels in the groundwater flow paths at the Dunka Road average between 20 and 60 mg/L. Maximum P90 levels in leachate from mine features is presented in the following table, with

approximate values taken from the Water Modeling Data Package Vol. 1, Attachment J (PolyMet 2013i).

	Cat. 2/3 Stockpile	Ore Surge Pile	Cat. 1 Stockpile	East Pit Porewater
Sulfate (mg/L)	12,000	13,000	4,000	2,400

Sulfate in the Category 1 leachate is of particular concern, because it continues at this level beyond Year 200. Some unknown amount of this water is likely to discharge into the wetland immediately south of Yelp Creek; Yelp Creek itself is located about 1,000 feet from the foot of the stockpile.

At the Tailings Basin, seepage is predicted to be as high as 850 mg/L in the short term, and 380 mg/L in the long term (more than 200 years). See Water Modeling Data Package Vol. 2, Att. F (PolyMet 2013j).

In summary, due to deficiencies in the SDEIS we do not know how much sulfate would be released to the St. Louis River over the coming decades and centuries due to this mine, but we do know that the potential is high. We also do not know what level we need to reduce sulfate additions to wetland, stream and lake environments to restore the ecosystem and eliminate negative impacts on human and wildlife health and welfare, but we do know that significant reductions are needed, and that the level is likely to be below the level at which PolyMet expects to discharge for hundreds of years. This information must be disclosed in the SDEIS.

3. The Cumulative Effects Assessment Significantly Underestimates the Acreage of Impacted Wetlands

The wetlands cumulative effects discussion begins by including only the direct impacts of the Proposed Project. SDEIS 6-35. This exclusion of most of the impacts of the project is unexplained and unacceptable. If the rationale is that lost wetlands can be expected to reappear once the pits are filled, this is not acceptable. The impacts of forty years of wetland loss and degradation must be included in the cumulative impacts analysis, including the long-term effects of vegetative and other changes. The cumulative impacts requirement is not limited to permanent wetland loss.

The analysis should not include the East Pit wetland or the West Pit in its calculations. These areas will not meet water quality standards, and the West Pit, at least, will be fenced. Water will be pumped from the West Pit in part to limit the amount of water flowing out to wetlands. Referring to the West Pit as “deep water habitat,” SDEIS 6-35, begs the question, habitat for what?

In addition, the analysis does not include impacts from Northshore Mining. Northshore Mining estimates that its planned expansion will increase inflow to the Peter Mitchell Pit to 280 percent of its current inflow, Golder Assoc., Type II Virginia

Formation Stockpile Plan (May 2, 2013) (Ex. 35). This amount of increase will surely have some impact on wetlands. Furthermore, it plans to completely eliminate 6,000 acres of the Partridge River watershed and discharge all pit water to the Rainy River watershed following closure. Northshore Mining Company, “Ultimate Pit Limit – Permit to Mine – December 2010” (April 12, 2013) (Ex. 36). This will also impact wetlands in the Partridge River watershed.

4. Lost Functions of Wetlands Due to the Proposed Project Cannot Be Replaced Outside of the St. Louis River Watershed.

In many cases, the conclusion that destruction of wetlands will have significant environmental impacts can be avoided by providing compensatory mitigation that addresses those impacts. For instance, if the significant impact is a loss of flood water storage capacity, restoration of a former wetland area in the same watershed might provide comparable water storage capacity. If the significant impact is a loss of wildlife habitat, comparable wildlife habitat could be created within the range of the species for which that habitat is important. In this case, most of the proposed mitigation is located in places where it cannot compensate for lost functions. The restoration of wetlands outside of the St. Louis River watershed cannot compensate for the loss of functions such as flood control, water storage to support river and stream base flows, and filtering of pollutants and particulates within the watershed.

In particular, peat is known to sequester mercury. The destruction of peat bogs will not only release mercury currently stored in peat, it will reduce the mercury sequestration capacity of the watershed, which is likely to have a continuing impact on mercury levels in rivers and streams, and thus on the level of mercury in fish tissue within the St. Louis River system. The loss of this capacity cannot be compensated for by increasing the capacity for mercury sequestration in another watershed (even if the creation of a peat bog were possible).

In addition to these watershed-dependant functions, the mine site provides habitat for a number of wildlife species that do not range as far south as the proposed mitigation sites. Two of these are Canada lynx and moose. Moose in particular need wetlands for thermoregulation in summer, and with global warming that need is increasing. Northeastern Minnesota is increasingly becoming the last viable area within the Midwest for northern species as temperatures grow warmer, and many other species could be affected by the loss of habitat in this area. The restoration or rehabilitation of wetlands south of St. Louis County will not compensate for this loss.

Another function that will be lost at the site is the loss of biodiversity, particularly in regards to black spruce/Jack pine forest, which is considered imperiled/vulnerable in Minnesota. This ecosystem is disappearing due to global warming, and any attempt to create this ecosystem is unlikely to be successful; that would be particularly true south of St. Louis County. Finally, as discussed above/below, the wetland fill would destroy one of the few known Minnesota populations of floating marsh marigold, which is state-listed

as endangered and has been found only in St. Louis County. Restoring wetlands in the Aitkin and Hinckley areas will not replace habitat for this rare plant.

This should not be construed as a complete list of the functions that cannot be replaced by the proposed mitigation. As discussed above, the SDEIS must provide an assessment of lost functions; that assessment must consider whether mitigation will occur within a geographic scope that would actually address those losses.

5. A Mitigation Plan for Indirect Impacts to Wetlands Must Be Included in the SDEIS

In addition to the direct destruction of 916 acres of wetlands, the SDEIS acknowledges that the proposed project would destroy or degrade thousands of additional acres. Neither the permit application nor the SDEIS provides a mitigation plan for this significant loss of wetlands. Instead, the SDEIS includes a promise to monitor, with no details regarding parameters, conditions that would trigger a need for additional mitigation, or description of what that additional mitigation would consist of. Without this information, the public (and decision makers) have to assume that an undisclosed amount of wetlands will simply be lost.

In regard to this issue along with many others, the SDEIS seems to have been prepared in such a way as to evade NEPA and MEPA purposes. Vague promises that impacts will be taken care of seem designed to minimize those impacts in the perception of the reader. This does not constitute the “hard look” that NEPA and MEPA require. *See, e.g., Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372 (9th Cir. 1998) (“vague references to mitigation measures” held insufficient for NEPA).

K. The SDEIS Analysis of Impacts to Wildlife is Inadequate

1. The SDEIS Fails to Demonstrate that the Proposed Mine Would Not Violate the Endangered Species Act

The SDEIS acknowledges that two square miles of Canada lynx habitat would be destroyed by the Proposed Project. It also acknowledges that the project would impact two of either thirteen or eighteen remaining wildlife corridors that allow wildlife (including lynx) migration from northwest to southeast of the Mesabi Iron Range. Most of the other corridors will also be impacted by other foreseeable projects and expansions, some to the point of elimination. The SDEIS acknowledges the potential for lynx mortality from mine-related transportation. What the SDEIS fails to explain is why these impacts would not violate the Endangered Species Act.

The Endangered Species Act (“ESA”) represents “the most comprehensive legislation for the preservation of endangered species ever enacted by any nation.” *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 180 (1978). “The plain intent of Congress in enacting this statute was to halt and reverse the trend towards species extinction, whatever the cost.” *Tennessee Valley Authority*, 437 U.S. at 184. In enacting

the ESA, Congress spoke “in the plainest of words, making it abundantly clear that the balance has been struck in affording endangered species the highest of priorities, thereby adopting a policy which it described as ‘institutionalized caution.’” *Id.* at 194.

“One would be hard pressed to find a statutory provision whose terms were any plainer than those in [Section] 7 of the Endangered Species Act.” *Tennessee Valley Authority*, 437 U.S. at 173. “Its very words affirmatively command all federal agencies ‘to insure that actions *authorized, funded, or carried out* by them do not *jeopardize* the continued existence’ of an endangered species or ‘*result in the destruction or modification of habitat of such species.*’” *Id.* (quoting 16 U.S.C. § 1536) (emphasis in original). “This language admits of no exception.” *Id.*

Section 7 of the ESA mandates that “federal agencies take no action that will result in the ‘destruction or adverse modification’ of designated critical habitat.” *National Wildlife Federation v. National Marine Fisheries Service*, 524 F.3d 917, 933 (9th Cir. 2007), *quoting* 16 U.S.C. § 1536(a)(2). “Destruction or adverse modification” of critical habitat is defined as “a direct or indirect alteration that appreciably diminishes the value of the critical habitat for both the survival and recovery of a listed species.” 50 C.F.R. § 402.02. “Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical.” *Id.*

The courts have found that this regulatory definition reads the “recovery” goal out of the statutory adverse modification inquiry, “and that agencies must in fact consider impacts that appreciably diminish the value of critical habitat for *either* survival or recovery.” *National Wildlife Federation*, 524 F.3d at 934; *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service*, 378 F.3d 1059, 1069-71 (9th Cir. 2004). Thus, the agencies’ assessment of the impacts of a proposed action on a listed species’ critical habitat must address the project’s potential impact on the species’ habitat in terms of the species’ recovery as well as its survival. In addition, agencies are not allowed to characterize as “insignificant” the potential impacts on a species’ critical habitat by considering only the broad scale or long-term impacts. *National Wildlife Federation*, 524 F.3d at 935; *Gifford Pinchot*, 378 F.3d at 1069.

In the SDEIS for the PolyMet mine proposal, the agencies acknowledge that the Mine Site is within designated critical habitat for Canada lynx, which includes most of northeastern Minnesota. SDEIS 4-202, 5-364. The Mine Site is within “Lynx Analysis Unit” 12 on the Superior National Forest, and 96% of this Unit currently provides suitable lynx habitat. *Id.* In addition, lynx have been spotted within close proximity to the Mine Site. SDEIS 4-202, 5-364. At least 20 different lynx have been sighted within 18 miles of the project area, with the nearest reported sighting approximately six miles from the Mine Site. *Id.* The Forest Service also observed lynx tracks at the Mine Site in 2010, with multiple observations of lynx sign within five miles of the site. SDEIS 4-203, 5-364. The Mine Site also provides the preferred cover types for snowshoe hare, which is the lynx primary prey species. SDEIS 4-203.

Even though the agencies have been analyzing this proposed mine for a number of years, the SDEIS states that ESA Section 7 consultation between the action agencies and the U.S. Fish and Wildlife Service is still “ongoing and will continue throughout the EIS process.” SDEIS 5-364. Pursuant to NEPA, the agencies should have waited to release the SDEIS for public comment until after ESA consultation was completed, to allow the concerned public to know the position of the expert wildlife agency regarding the impacts of the proposed mine on Canada lynx during the public comment period. See 40 C.F.R. §§ 1502.25(a), 1502.9(a).

The SDEIS acknowledges that the site clearing and mining activities associated with the proposed mine would affect lynx “by reducing available habitat and increasing habitat fragmentation.” SDEIS 5-365. According to the SDEIS, however, the total effect of increased activity at the Mine Site is unknown. *Id.* As explained in the SDEIS, individual lynx displaced from the Mine Site may be affected “by increased stress and potential mortality due to utilization of unfamiliar territory and competition with other lynx or predator species.” *Id.*

Significantly, the proposed mine would destroy approximately two square miles (1,454 acres) of suitable lynx habitat. SDEIS 5-365. “Potential lynx habitat would be lost for the duration of mine operations (over 20 years) and an additional 20 years or more after closure before suitable lynx habitat would again occur at the Mine Site.” *Id.* The effects of the proposed mine on Canada lynx include the “direct decrease and fragmentation of habitat, including designated critical habitat.” SDEIS 5-367.

In addition to the direct impacts on lynx habitat at the Mine Site, an average of 2,066 miles per day of vehicular traffic is expected within the site, with an additional 1,734 miles of traffic each day between the Mine Site and Plant Site. SDEIS 5-365, 5-366. This does not include additional highway traffic from workers driving to and from work, or truck traffic delivering supplies. The agencies acknowledge that increased vehicle and train traffic could further affect lynx, including through vehicle collisions. SDEIS 5-366; *see also* SDEIS 5-370 (“Wildlife mortality generally increases with increasing traffic volumes”). Indeed, the U.S. Fish and Wildlife Service has documented two lynx killed by trains and seven lynx struck by vehicles between 2001 and 2013. SDEIS 5-364.

Moreover, the proposed mine would further affect lynx and lynx critical habitat through impacts to two of the remaining wildlife corridors in this region. As explained in the SDEIS:

Wildlife could be affected by the NorthMet Project Proposed Action and other actions through a cumulative disruption of their travel corridors. These actions could pose additional barriers to wildlife movement by increasing the number of isolated patches of suitable habitat, increasing mortality during transit, and physically blocking travel. This may lead to increased population and genetic isolation and decreased meta-population dynamics, which in turn could lead to decreases in overall population stability and persistence.

SDEIS 6-56.

There have been two recent studies of the few remaining wildlife corridors through the Mesabi Iron Range and Arrowhead Region. In 2006, Emmons and Olivier Resources prepared for the DNR, *“Cumulative Effects Analysis on Wildlife Habitat Loss/Fragmentation and Wildlife Travel Corridor Obstruction/Landscape Barriers in the Mesabi Iron Range and Arrowhead Regions of Minnesota.”* (Emmons & Olivier 2006). As stated by Emmons & Olivier, wildlife travel through this region is restricted “because of the extensive change to the landscape, including large mine pits, stockpiles, mining infrastructure, regional development associated with the Mesabi Iron Range, and highways.” *Id.* at 2.

Emmons & Olivier identified only 13 remaining wildlife corridors across the 100 mile Mesabi Iron Range. *Id.* at 51. Moreover, Emmons & Olivier found that any future losses of these relatively small remaining corridors may be considered significant. *Id.* Additionally, due to cumulative effects of past habitat losses in this region for “mammalian species of greatest conservation need,” Emmons & Olivier determined that “any future losses to the habitat requirements for these species could be considered significant.” *Id.* at 52.

The second study is entitled, *“Cumulative Effects Analysis of Wildlife Habitat and Threatened and Endangered Wildlife Species, Keetac Expansion Project,”* prepared by Barr Engineering in 2009. (Barr Report 2009a). The Barr Report states that mining features already cover 118,314 acres along the Iron Range, including 36,962 acres of open pit mines, 78,620 acres of stockpiles and tailings basins, and 212 acres of facilities and infrastructure. *Id.* at 4. The cumulative impacts of 125 years of mining in this region has fragmented habitat and resulted in a loss of wildlife travel corridors. *Id.* “It is feasible that in the future, mining in the Iron Range could potentially culminate in a 100-mile long landscape barrier that severs wildlife travel corridors, which may have impacts on dispersal, migration, and/or seasonal movements of many species.” *Id.*

The Barr Report identified 18 remaining wildlife corridors. *Id.* at 51. Of the 18, the Barr Report predicts that “four will likely become completely impassable within the next 25-30 years as a result of planned mining activities,” and an additional four corridors “will retain some functionality, but will be significantly degraded by future mining plans.” *Id.* at 56. “As wildlife are increasingly exposed to mining activity, roads, and urban centers due to the degradation of available corridors, the incidence of wildlife mortality within the corridors is likely to increase.” *Id.* Due to insufficient data, however, the Barr Report was unable to determine whether wide-ranging mammals such as lynx would be “sensitive” to these cumulative effects. *Id.*

As summarized in the SDEIS, there are 13 wildlife travel corridors that remain along the Mesabi Iron Range, ranging from less than 0.1 mile to over 3.2 miles wide. SEIS 6-56. “Of these 13 corridors, “two are in the vicinity of the Mine Site and Plant Site.” SDEIS 6-56. The first is located just a mile from the Plant Site, *id.*, and the second

is located just a half mile from the proposed Mine Site. SDEIS 6-57. “Operations at the Mine Site would indirectly affect the corridor by reducing its size and acting as a source of noise and activity near the large habitat block southeast of the corridor.” *Id.* Additionally, the proposed mine’s transportation and utility corridor between the Mine Site and Plant Site runs parallel to wildlife corridors and would further affect wildlife use. SDEIS 5-375, 6-57.

Moreover, other reasonably foreseeable projects are anticipated to adversely affect the remaining wildlife travel corridors in the region, including the complete loss of some of the corridors. Table 6.2-16, SDEIS 6-57. As explained in the SDEIS,

These effects may include blocking or encroachment into the mapped wildlife corridors, which affects adjacent habitat that may make the corridor less valuable to wildlife, and increasing traffic along new or existing roads through the corridor. *The effects on these corridors include complete loss (depending upon final extent of activities), habitat isolation, fragmentation, and/or minimal effect.”*

SDEIS 6-57 (emphasis added); see Table 6.2-16 (describing impacts to each of the corridors, including the overall loss of one corridor due to Essar Steel, the complete loss of a corridor due to U.S. Steel Keetac, the direct loss of a corridor due to U.S. Steel Minntac, and considerable habitat loss, fragmentation and isolation to other corridors caused by traffic and development).

In sum, the proposed PolyMet mine’s direct and long-term destruction of two square miles of designated lynx critical habitat, along with the mine’s adverse impacts to at least one of the few remaining travel corridors for lynx, would result in the “destruction or adverse modification” of critical habitat, which is prohibited by the ESA. 16 U.S.C. § 1536(a)(2). The conversion of the critical habitat at the Mine Site to an open-pit mine would destroy and adversely modify all of the primary constituent elements for Canada lynx identified by the U.S. Fish and Wildlife Service, including the destruction of boreal forest landscapes that support a mosaic of forest stages, sites for denning, and matrix habitat allowing for travel and habitat connectivity. See 74 Fed. Reg. 8616, 8638 (Feb. 25, 2009) (Final Rule designating Canada lynx critical habitat).

Additionally, despite the acknowledged impacts to lynx, lynx habitat, and the few remaining wildlife travel corridors in the region, the SDEIS entirely fails to consider or address the impacts of the proposed mine project on lynx recovery. By significantly adding to the widespread cumulative impacts of mining projects and other development across this region, including contributing to the continuing decrease in available travel corridors, the proposed mine project is likely to appreciably contribute to the diminishment of the chances for the lynx population in this region to recover, and to be eventually taken off the list of threatened species. The SDEIS’s failure to consider this fundamentally important factor concerning lynx violates NEPA and the ESA.

Section 9 of the ESA prohibits any person from “taking” a threatened or endangered species. 16 U.S.C. § 1538(a)(1)(B); 50 C.F.R. § 17.31(a); *Animal Protection*

Institute v. Holsten, 541 F.Supp. 2d 1073, 1076 (D. Minn. 2008). “Take” is defined broadly to include “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” *Animal Protection Institute*, 541 F.Supp. 2d at 1076, *quoting* 16 U.S.C. § 1532 (19). The proposed mine would likely result in the “take” of Canada lynx, through the destruction of their critical habitat, vehicle and train collisions, and the continued loss and fragmentation of the few remaining wildlife corridors in the area.

2. The SDEIS Fails to Take a Hard Look at Impacts to Moose

Moose, which have been observed in the project area (SDEIS, p. 4-210), are listed by the state as a species of special concern.⁷ The DNR and Forest Service have been well aware for years that the moose population in the state and on the Superior National Forest is in precipitous decline. The SDEIS’s analysis of the potential impacts of the mine proposal on moose and moose habitat, however, is almost nonexistent.

In devoting only one sentence to the decline of the state’s moose population, SDEIS 4-210, the SDEIS vastly understates the dramatic decrease in moose populations across Northern Minnesota. According to the DNR, the population estimate for moose in the state was 8,840 in 2006, and in 2014 is estimated at 4,250, a 50 percent drop in eight years. Glenn D. DelGiudice, “2014 Aerial Moose Survey” (2014), accessed at http://files.dnr.state.mn.us/wildlife/moose/2014_mooseurvey.pdf on March 11, 2014.

The SDEIS also fails to recognize the critical importance of northeastern Minnesota for the remaining moose population in the state. Moose also used to be common in northwestern Minnesota, but that population has disappeared over the last twenty years. From a population of 4,000, fewer than 100 remain, with any rebound seen as very unlikely. This leaves northeastern Minnesota, including the Proposed Project area, as the only remaining refuge for the state’s declining moose population.

In failing to properly recognize the moose’s dramatic decrease in population, the SDEIS’ analysis of the potential environmental consequences to moose is also deficient. The SDEIS acknowledges that 2,775 acres of key moose habitat types would be directly affected by the proposed mine. SDEIS 5-377. The agencies summarily conclude, however, that even though moose would be adversely affected through habitat loss and fragmentation, an adverse affect would be “not likely at the population level.” *Id.* NEPA prohibits agencies from making such sweeping general statements without providing supporting data or analysis. *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1150 (9th Cir. 1998); 40 C.F.R. § 1502.24.

Minnesota’s moose population is in such extremity that any loss of habitat or habitat fragmentation is potentially significant, and needs to be carefully scrutinized.

⁷ A species of special concern is defined as a species that is “extremely uncommon in Minnesota, or has unique or highly specific habitat requirements and deserves careful monitoring of its status.” Minn. Stat. § 84.0895, Subd. 3.

Moose are likely to be affected by the proposed NorthMet project in a number of ways that the SDEIS fails to sufficiently address or disclose. First, vehicle and train collisions have been recognized for decades as an important source of moose mortality. *See, e.g.*, Belant, Jerold L. “Moose collisions with vehicles and trains in Northeastern Minnesota,” *Alces* 31:45-52 (1995) (Ex. 37); Hurley, Michael V., Rapaport, Eric K., and Johnson, Chris J. “A spatial analysis of moose-vehicle collisions in Mount Revelstoke and Glacier National Parks, Canada,” *Alces* 43: 79-100 (2007) (Ex. 38); Rodgers, Arthur R. and Robins, Patrick J. “Moose detection distances on highways at night,” *Alces* 42:75-87 (2006)(Ex. 39).

Second, although the primary cause of moose mortality seems to be a variety of parasites that are flourishing due to warmer temperatures and increased deer populations, in light of these factors optimal habitat is likely becoming more important to moose survival. *See, e.g.*, Peterson, Rolf, *et al.*, “Report to the Minnesota Department of Natural Resources (DNR) by the Moose Advisory Committee” (Aug. 18, 2009) (Ex. 40). Moose use a variety of habitat types to meet their various needs. For instance, they feed primarily in young, early successional forests, but rest and avoid temperature extremes in mature conifer forests. As large animals with heavy coats, moose expend a great deal of energy simply moving from one habitat type to another. When added to the stress of heat, parasites, and disease, this expenditure of energy may be enough to tip the scales toward physical collapse. Thus the presence of areas that provide a mosaic of habitat types within close proximity to each other may be an important component of moose survival in Minnesota. Although the Mine Site has apparently not been assessed on this basis, it appears from descriptions to provide such a mosaic of habitat types.

Third, moose survival may also be affected by the expenditure of energy when startled by noise or to avoid areas affected by human activity. The deficiency in the impacts analysis in regard to the impact of noise on wildlife, which is more thoroughly discussed below, is particularly relevant to moose survival. *See* Colescott, Julian H. and Gillingham, Michael P. “Reaction of moose to snowmobile traffic in the Greys River Valley, Wyoming,” *Alces* 34(2): 329-338 (1998) (Ex. 41); Lykkja, Odd N., *et al.* “The effects of human activity on summer habitat use by moose,” *Alces* 45:109-124 (2009) (Ex. 42); Neumann, Wiebke, Ericsson, Goran, and Dettki, Holger, “The impact of human recreational activities: Moose as a case study,” *Alces* 47:17-25 (2011) (Ex. 43); Rudd, Lorrain Triest, and Irwin, Larry L. “Wintering moose versus oil/gas activity in Western Wyoming,” *Alces* 21:279-298 (1985) (Ex. 44); Silverberg, Judith K., Pekins, Peter J., and Robertson, Robert A. “Moose responses to wildlife viewing and traffic stimuli,” *Alces* 39:153-160 (2003) (Ex. 45). Finally, the same impacts on wildlife corridors that will affect lynx will affect moose, in much the same way.

As noted below, the SDEIS analysis of the potential impacts to moose is even more deficient and problematic in the cumulative impacts analysis, where moose are not even mentioned. Overall, the SDEIS has failed to meaningfully consider and disclose the impacts of the proposed mine on the state’s dramatically declining moose population. The omission of any meaningful consideration of such a fundamental factor “precludes

the type of informed decisionmaking mandated by NEPA.” *Foundation for North Am. Wild Sheep v. U.S. Dept. of Agriculture*, 681 F.2d 1172, 1178 (9th Cir. 1982).

3. The SDEIS Fails to Adequately Address Impacts to Birds and Wildlife Resulting From the Polluted Pit Lake and Tailings Pond

The SDEIS acknowledges that the proposed mine project would result in the creation of a permanent “pit lake” of 321 acres, and a permanent tailings pond. *See, e.g.*, SDEIS ES-24, Figure 3.2-9, 3-65, 3-129. The SDEIS further acknowledges that the existing LTV Tailings Basin “attracts Canada geese, ducks, loons, and other waterfowl.” SDEIS 4-212. The SDEIS fails, however, to provide a detailed analysis of the environmental consequences to birds and wildlife that would result from the creation of a permanent, polluted pit lake at the Mine Site, and creation of a permanent tailings pond at the Plant Site.

The potential impacts of a mine pit lake on migratory birds and other wildlife are widely recognized. As summarized by the National Research Council, in response to a Congressionally-mandated study,

Pit lakes have the potential to create long-term impacts on the environment that include major surface disturbances and alterations of pre-mining water quality and quantity. . . . [T]he concentration of metals, other contaminants, and salinity in the pit through evaporation may become a long-term water quality issue, especially for migratory birds and terrestrial wildlife. For example, waters of the Berkeley pit in Butte, Montana, were lethal to migrating snow geese that used the lake as a stopover in 1995.

See National Research Council, *Hardrock Mining on Federal Lands* (1999) accessed at http://www.nap.edu/openbook.php?record_id=9682&page=R1 on March 11, 2014.⁸

The SDEIS recognizes that wildlife, including aquatic birds, may utilize the open water created by the proposed mine project, especially during migration. SDEIS 5-373. As described above, the newly created and permanent pit lake, and the tailings pond, would contain contaminated water; according to the SDEIS “[s]tate water quality standards do not apply to the pit lake or Tailings Basin.” SDEIS 5-374. Thus, the SDEIS

⁸ *See also* U.S. Fish & Wildlife Service Region 6, “Contaminant Issues—Industrial Wastewater Impoundments” (stating that “[i]ndustrial wastewater impoundments can attract and kill migratory birds and other wildlife if they contain hazardous substances such as cyanide, oil, salts or acids”) accessed at <http://www.fws.gov/mountain-prairie/contaminants/contaminants3.html> on March 11, 2014; *and* Hooper, Michael, John Isanhart and Dr. Stephen Cox, “Avian Consumption and Use of Contaminated Water Sources: Toxicological Assessments of Exposure, Effects and Susceptibility” (Feb. 15, 2007) (Ex. 46) (“[m]igratory birds that use mine tailings waters, which often contain elevated levels of toxic metals, for stopover sites may be at increased risk to injury or death as a result of gorge drinking and physiological responses to ‘salt’ water”).

further acknowledges that some wildlife species “may be susceptible to mercury exposure directly from open water sources such as the pit lake and Tailings Basin pond,” and that some “species such as loons, osprey, mink, and otter may be affected.” SDEIS 5-373, 5-374. The SDEIS’ general statements of “some” adverse impact to “some” species resulting from the creation of a contaminated pit lake fails to meet the “hard look” mandated by NEPA. See *Mid States Coalition for Progress v. Surface Transp. Board*, 345 F.3d 520, 533 (8th Cir. 2003). As discussed above, the Agencies have information regarding the predicted level of contaminants in the West Pit lake and the Tailings Basin pond. This information, along with what is known about the impacts on birds and wildlife species that may use such waters, must be disclosed in the SDEIS.

Furthermore, the SDEIS analysis of the impacts of the permanent, polluted pit lake and the Tailings Basin pond fails to even mention the Migratory Bird Treaty Act (MBTA). See SDEIS 5-373. Under the MBTA, it is illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird except under the terms of a valid permit. 16 U.S.C. § 703; 50 C.F.R. § 21.11. Moreover, “take” is broadly defined to include “pursue, hunt, shoot, wound, kill, capture, or collect,” or attempt to do so. 50 C.F.R. § 10.12. The SDEIS’s failure to address the proposed mine’s compliance with the MBTA, despite the proposed creation of a permanent 321 acre pit lake and the acknowledgment that migratory bird species may be adversely affected by this newly created “open water” habitat, violates NEPA and the MBTA.

4. The SDEIS Fails to Adequately Address Impacts to Birds and Wildlife Resulting From Noise and Human Activity

The SDEIS tells us that noise will impact wildlife, and that “Songbird populations have been shown to decrease with noise levels as low as 35dB.” SDEIS 5-370. However, the SDEIS says nothing about the magnitude of the impacts.

The section on noise impacts on humans provides a map with a contour line described as “L50 Audibility Limit.” SDEIS Figure 5.2.8-3. According to a note on the figure, the “baseline daytime L50 is 44 dBA. We take this to mean that the L50 contour line shown on the map is the location within which noise will be above 44 dBA, although Table 5.2.8-7 gives the nighttime L50 level of 34 dBA. The SDEIS does not explain the difference between dBA and dB, but our understanding is that dBA is a measurement that discounts a certain degree of the decibels at lower frequencies, because they are less discernable to the human ear. In other words, the dBA will always be a lower number than the dB. Thus even if the contour map is based on the nighttime dBA level, the dB level can be assumed to be above the L50 level.

This map shows a remarkably large area within which songbirds could be affected. It indicates a circular area that appears to be about 20 miles in diameter. It thus appears that the project would affect more than 300 square miles of songbird habitat; if this is the case, the SDEIS needs to say so.

The SDEIS also states that noise is likely to impact other wildlife species, with no indication of the magnitude of the impact. The SDEIS needs to provide an estimate of the acreage of wildlife habitat that will be degraded due to human noise and activity. The effect of noise, traffic, and other human activity in addition to the direct loss of habitat and the blockage of wildlife corridors needs to be addressed to give a complete picture of the impacts of this project on wildlife.

5. The SDEIS Cumulative Impacts Analysis for Wildlife is Inadequate

NEPA requires the Forest Service to consider the potential cumulative impacts of proposed actions. 40 C.F.R. § 1508.25(c); *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1379 (9th Cir. 1998). “To ‘consider’ cumulative effects, some quantified or detailed information is required.” *Neighbors of Cuddy Mountain*, 137 F.3d at 1379. “Without such information, neither the courts nor the public, in reviewing the [agency’s] decisions, can be assured that the [agency] provided the hard look that it is required to provide.” *Id.* “General statements about ‘possible’ effects and ‘some risk’ do not constitute a ‘hard look’ absent a justification regarding why more definitive information could not be provided.” *Id.* at 1380. “Nor is it appropriate to defer consideration of cumulative impacts to a future date,” *id.*, as NEPA requires consideration of the potential impact of an action *before* the action takes place. 40 C.F.R. § 1500.1(b).

In its cumulative impacts analysis for wildlife, the SDEIS provides very general statements concerning some risk and impacts, which fall far short of the detailed analysis required by NEPA. An example from the SDEIS is as follows:

In addition to habitat fragmentation and loss and effects on wildlife crossing corridors, wildlife species of concern in the Nashwauk Uplands and Laurentian Uplands ecological subsections are subject to other stressors that could result in cumulative effects. Traffic and activity related to mining projects, urban development, forestry, tourism, and road expansions all increase the risk for special status wildlife species and, as such, could result in cumulative effects.

SDEIS 6-58. As another example, the Agencies unremarkably proclaim that “[s]ome wildlife species in northeast Minnesota are sensitive to habitat changes and may be adversely affected by change.” SDEIS 6-55. Absent a justification as to why more detailed and quantifiable information cannot be provided, these very general statements are insufficient and fail to comply with NEPA. *Neighbors of Cuddy Mountain*, 137 F.3d at 1379-80.

The courts have in fact rejected a similar cumulative effects analysis for a proposed mining project. In *Great Basin Mine Watch v. Hankins*, 456 F.3d 955, 971-974 (9th Cir. 2006), the court struck down the agency’s reliance on the same sort of brief, generalized descriptions of mining impacts in the region. The court required the agency to include “mine-specific ... cumulative data.” *Id.* at 973. Relying on prior cases, the court highlighted the need for a “quantified assessment of [other projects] combined

environmental impacts” and “objective quantification of the impacts.” *Id.* at 972. The SDEIS for the proposed PolyMet mine similarly fails to provide the required detailed analysis of cumulative impacts.

The SDEIS’s cumulative effects analysis for wildlife, for both the proposed mine and the proposed land exchange, entirely fails to even mention moose. SDEIS 6-50 to 59 and 6-122 to 126. This despite the documented presence of moose in the area, its rapidly declining population and designation as a species of special concern, its iconic status to the citizens of Minnesota, and its cultural significance to the Tribes. The SDEIS admits that the proposed PolyMet mine by itself “will affect moose individuals in the vicinity through habitat loss and fragmentation,” SDEIS 5-377; the fact that there will be cumulative impacts to moose and moose habitat resulting from other actions and activities in the region, including numerous other mining related projects and activities, is obvious. The agencies’ failure to address such a fundamentally important factor in the SDEIS violates NEPA. *See Foundation for North Am. Wild Sheep v. U.S Dept. of Agric.*, 681 F.2d 1172, 1178 (9th Cir. 1982).

Similarly, even though the SDEIS claims that the cumulative impacts analysis for wildlife is focused on potential losses to sensitive species and their habitat, including federally listed species, SDEIS 6-50, the cumulative impacts analysis for the proposed mine fails to mention or address Canada lynx. SDEIS 6-50 to 59. This is despite the likely presence of lynx in the area, its designation as a federally listed species under the ESA, and the formal designation of critical habitat for lynx across much of the region. As with moose, there will undoubtedly be cumulative impacts to lynx and lynx habitat as a result of widespread mining, mineral exploration, and other activities in this region, and the failure to address and disclose these cumulative impacts in the EIS violates NEPA.

As for the wolf, which until recently was designated as threatened with extinction under the ESA and remains a state species of concern, the SDEIS cumulative impacts analysis devotes only one sentence to potential impacts: “The NorthMet Project Proposed Action and other cumulative actions may increase pressures from loss of habitat and disruption of corridors which may affect the total numbers of animals in the future.” SDEIS 6-59. Clearly NEPA requires a more detailed analysis, or the cumulative impacts requirement is rendered meaningless.

The SDEIS cumulative impacts analysis for wildlife also entirely fails to consider or address impacts of the widespread past, present, and reasonably foreseeable mineral exploration across the region. In May, 2012, the Forest Service completed an EIS for 29 federal hardrock mineral prospecting permits, which acknowledged impacts to wildlife including up to 163 miles of new roads, increased traffic volume, and the increased noise from drilling. While the mineral prospecting EIS was limited to an identified number of projects where the federal government owns the mineral rights, there are many additional mineral exploration projects within and near the Superior National Forest where the mineral rights are owned by private interests or the State. Additionally, the BLM is currently considering potential lease renewals for Twin Metals, which would result in additional exploration and other mining activities. And the Forest Service is in the

process of preparing an Environmental Assessment of the impacts of the Twin Metals hydrogeological study. All of these projects will have impacts on wildlife, each of which may not be significant standing alone, but which are very likely to be significant in the aggregate. None of these projects, however, are considered in the SDEIS cumulative impacts analysis.

The SDEIS also fails to consider the cumulative impacts of the continued destruction of wetlands in this region, and the resulting impacts to wildlife. This is especially important due to the changes anticipated in the region from global climate change. As noted by the Tribal cooperating agencies in their comments on the initial DEIS for this proposal, the Minnesota wildlife advisory committee studying the decline of the moose population in northeastern Minnesota recommended preserving wetlands as sanctuaries for moose from heat stress, see Peterson, Rolf, *et al.*, “Report to the Minnesota Department of Natural Resources (DNR) by the Moose Advisory Committee” (Aug. 18, 2009) (Ex. 40), and yet PolyMet is proposing the largest direct wetland fill ever permitted in this region, with the proposed wetland mitigation located outside of the area that still supports a moose population.

Last, the SDEI cumulative impacts analysis fails to adequately analyze and disclose the potential impacts to wildlife resulting from the continued decrease in the few available wildlife travel corridors in the region. The SDEIS notes that Emmons & Olivier (2006) identified 13 remaining wildlife corridors, while Barr Engineering (2009a) identified five additional corridors. SDEIS 6-56. The cumulative impacts analysis also restates the anticipated impacts of the proposed PolyMet mine on two of these remaining wildlife travel corridors. SDEIS 6-56, 6-57. And the SDEIS identifies other projects that may impact some of the other remaining corridors, stating that “[t]he effects of these corridors include complete loss (depending upon final extent of activities), habitat isolation, fragmentation, and/or minimal effect.” SDEIS 6-57. What the SDEIS fails to provide, however, is any analysis as to what this anticipated continued decline in the few remaining travel corridors actually means for wildlife in the region. This is especially problematic for wide ranging species such as wolves, rapidly declining species such as moose, and already endangered species such as the Canada lynx.

L. The Discussion of Impacts on Vegetation and Ecosystems is Inadequate

1. The SDEIS Does Not Include a Mitigation Plan for Impacts to State-Listed Species

The SDEIS states that a “Take Permit” may be required for impacts to state-listed endangered and threatened species, and that mitigation may be required. As with indirect impacts to wetlands, the lack of a mitigation plan makes it impossible to judge what the impacts on these species will be. NEPA and MEPA both require that if mitigation is relied on to eliminate or lessen impacts, that mitigation and its likely efficacy must be described in the EIS. *Robertson v. Methow Valley Citizens*, 490 U.S. 332, 352 (1989). (Without “a reasonably complete discussion” of mitigation measures, “neither the agency nor other interested groups and individuals can properly evaluate the severity of the

adverse effects”); *CARD v. Kandiyohi County*, 713 N.W.2d 817 (Minn. 2006) (“When an RGU considers mitigation measures as offsetting the potential for significant environmental effects under Minn. R. 4410.1700, it may reasonably do so only if those measures are specific, targeted, and are certain to be able to mitigate the environmental effects.”)

2. The SDEIS Does Not Discuss the Statewide Cumulative Impacts to Listed Plants

The cumulative impacts assessment is limited to assessing the potential impacts of a handful of projects in the vicinity of the Proposed Project. For certain issues that approach is appropriate, but for others it is not. The cumulative impacts assessment must identify the appropriate scope of review for each issue, and proceed accordingly. The cumulative impacts assessment seems to have been limited based on the Minnesota Supreme Court holding in *CARD v. Kandiyohi County*, 713 N.W.2d 817 (Minn. 2006). We question the applicability of that holding to a situation involving the destruction of resources that are rare, threatened, or endangered throughout the state. Furthermore, this case does not apply to federal requirements under NEPA.

The discussion of cumulative impacts to state-listed plant species needs to consider threats to the species throughout its range within the state. Without this information, it is impossible to know the full significance of the destruction of populations due to this project. For example, the project is predicted to impact eight percent of the known populations of floating marsh marigold in the state, i.e., it will impact one of only twelve populations. Table 5.2.4.3, SDEIS 5-346. To understand the significance of the loss or degradation of this population, we have to know the status of the other populations.

M. The Cumulative Effects Analysis in the SDEIS is Inadequate

NEPA and MEPA both require an analysis of the potential cumulative impacts of a proposed action. See *e.g.*, 40 C.F.R. § 1508.25(c); Minn. R. § 4410.1700, subp. 7(B). The NEPA regulations provide the following definition for cumulative impacts:

Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 C.F.R. § 1508.7.

In order to properly consider cumulative effects in an EIS, NEPA requires quantified and detailed information. *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1379 (9th Cir. 1998). “Without such information, neither the

courts nor the public, in reviewing the [agency's] decisions, can be assured that the [agency] provided the hard look that it is required to provide.” *Id.* “General statements about ‘possible’ effects and ‘some risk’ do not constitute a ‘hard look’ absent a justification regarding why more definitive information could not be provided.” *Id.* at 1380. “Nor is it appropriate to defer consideration of cumulative impacts to a future date,” *id.*, as NEPA requires consideration of the potential impact of an action *before* the action takes place. 40 C.F.R. § 1500.1(b).

As explained throughout these comments, the SDEIS cumulative impacts analysis for a number of resources – including but not limited to water quality, wetlands, and wildlife - is inadequate and fails to comply with NEPA or MEPA. The SDEIS provides only general, mostly non-quantified analysis, which falls far short of the detail required. In *Great Basin Mine Watch v. Hankins*, 456 F.3d 955, 971-974 (9th Cir. 2006), the court struck down an agency’s reliance on generalized descriptions of mining impacts in a region, and instead required the agency to include “mine-specific ... cumulative data.” *Id.* at 973. The court highlighted the need for a “quantified assessment of [other projects’] combined environmental impacts” and an “objective quantification of the impacts.” *Id.* at 972. The SDEIS for the proposed PolyMet mine fails to provide this necessary analysis.

In addition to providing primarily general, non-quantified analysis, the SDEIS makes a number of fundamental mistakes in its cumulative impacts analysis, including failing to consider certain past, ongoing, and reasonably foreseeable actions. Table 6.2-1 lists the actions that the agencies considered. SDEIS, p. 6-7. Notably absent are the hundreds of exploratory drilling projects taking place in the same region on federal, state, and private lands. The fact that these exploratory drilling projects will collectively contribute towards significant cumulative impacts on a number of resources is acknowledged by the Forest Service in the forest-wide EIS that it prepared for only a subset of these past, present, and reasonably foreseeable projects.

Remarkably, the SDEIS excludes any consideration of the Twin Metals proposal, claiming that it is a “speculative action.” SDEIS 6-13. From its 8,800 square-foot headquarters in Ely that was constructed in 2011, to its 2014 “mid-prefeasibility” update, to its past and ongoing exploration throughout the region, to its proposed hydro-geologic study, and the ongoing consideration of the environmental impacts of its proposed lease renewals by the BLM, many components of the Twin Metals proposal are far beyond “speculative,” and are instead ongoing or at least reasonably foreseeable. Moreover, its January 2014 Mid-Prefeasibility Study shows that there will undoubtedly be cumulative impacts to numerous resources that would also be affected by the NorthMet project, as Twin Metals proposes to place its tailings facility in the same St. Louis River watershed. See Twin Metals Minnesota, “Mid Prefeasibility Study Update” (January 2014) (Ex. 48). Other features include a 25-year mine plan of operations focused on an underground mine at the Maturi deposit, a concentrator and other mine-related facilities near the Ely airport, underground corridors and connectors, and the use of the already polluting Dunka Pit.

The SDEIS also fails to include consideration of the major expansion proposed at United Taconite. The U.S. Army Corps of Engineers is currently considering the modification of Department of the Army Permit 81-172-13. The November 20, 2012, comments submitted on this proposed expansion by the Center for Biological Diversity, Save Lake Superior Association, Save Our Sky Blue Waters, the Sierra Club North Star Chapter, and the National Wildlife Federation demonstrate the high likelihood of major cumulative impacts to wetlands and other resources, and are hereby incorporated by reference. See Ex 49. As stated in our comments, the construction and utilization of tailings basin 3 at United Taconite would impact an additional 1,300 acres of wetlands and adjacent waterways in the St. Louis River watershed.

The SDEIS further fails to address PolyMet's plans for future expansion and/or for the Plant Site to be utilized for future copper-nickel mining projects in this region. Because the plant will operate only at approximately one-third capacity for the proposed NorthMet project, its use for other projects is likely. As explained in an Edison Investment Research Limited report, "there is a good chance PolyMet will be able to expand the size of its resource by 50-100% based on what we learned on a site visit." Edison Investment Research Ltd, "PolyMet Mining Corp.: Low-cost polymetallic development project" (Nov. 21, 2013) (Ex. 50) at 5. Additionally, "[t]here are roughly 11 mineral properties within shipping distance of PolyMet's mill," and "[w]e believe there is a good chance PolyMet will decide to toll process third-party ore from some relationships with one or more local projects." *Id.* at 10. Of course the additional use of this Plant Site for expansions and other mining proposals would significantly increase the amount of waste that would be deposited into the tailings basin. This would also greatly increase the amount of vehicle and rail traffic and other disturbances in the immediate project area, impacting numerous resources.

The SDEIS also fails to set forth the proper geographic scope for the cumulative impacts analysis, especially concerning the potential impacts to water, wetlands, and aquatics, where the agencies refuse to extend the scope of analysis to the entire St. Louis River watershed. There can be no dispute that past and ongoing mining and related activities have resulted in major, significant impacts to the St. Louis River watershed, all the way downstream to the estuary which is formally designated as an "Area of Concern." See *e.g.*, SDEIS, Appendix C (Tribal Cooperating Agencies Cumulative Effects Analysis, stating "that current, historic, and 'reasonably foreseeable' mining activities have profoundly and, in many cases permanently, degraded vast areas of forests, wetlands, air and water resources, wildlife habitat, cultural sites and other critical treaty-protected resources within the 1854 Ceded Territory"). From thousands of acres of permanent wetlands destruction, to sulfate pollution that has wiped out miles of historic wild rice, to mercury related health warnings, the agencies cannot simply ignore a century of impacts from mining and other industrial activities on this watershed. *Id.* (Tribal Cooperating Agencies, stating that the "relevant spatial scale for water quality and hydrologic cumulative effects analysis is the entire St. Louis River watershed," which "has experienced substantial historic, current and proposed expanded mining activities, as well as other industrial, agricultural and urban development").

As further explained by Tribal Cooperating Agencies, nearly half of the St. Louis River watershed “has experienced hydrologic alteration from extensive ditching.” *Id.*

It is reasonably foreseeable that an additional 3000 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 PolyMet NorthMet project, Mesabi Nugget Phase II, US Steel Minntac expansion, US Steel Keetac expansion, United Taconite Tails Basin 3 construction. 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.

Id.

Similarly, in looking forward, the agencies cannot simply proclaim that no specific mine, by itself, will have any significant impacts on the entire watershed. First, the agencies are wrong that large-scale open-pit mining, including the proposed PolyMet mine, will not have significant impacts on numerous resources, including water and wetlands. Second, both NEPA and MEPA recognize that cumulatively significant impacts may occur as the result of a number of individually insignificant impacts taking place over time within the same watershed. 40 C.F.R. § 1508.7; Minn. R. § 4410.0200, subp. 11; see *Citizens Advocating Responsible Development v. Kandiyohi County Board of Commissioners*, 713 N.W.2d 817, 836 (Minn. 2006) (recognizing that “an individually insignificant project may have a significant environmental effect when considered in conjunction with other projects”).

This is an error that the SDEIS makes again and again, for virtually every type of impact. From the air deposition of mercury to area lakes, to ambient air pollution and regional haze, to the loss of critical habitat, to impacts on state-listed endangered plants, the SDEIS compares the level of impact from this project to the overall impact and deems the impacts from this project insignificant and thus not of concern, even in regards to the cumulative problem. The SDEIS must reveal the level of cumulative impact that all sources together have on impacted resources, and acknowledge that the Proposed Project would be one of many sources that together cause the impacts.

Furthermore, the area of analysis and the sources that are considered should vary according to the nature of the resource and the impacts. The SDEIS cumulative impacts assessment names a certain set of sources, and then limits the analysis to contributions from those sources. This may be the current methodology used by the State of Minnesota, but it does not meet the requirements of federal law. Under the federal regulations, the cumulative impacts assessment must consider *all* sources, past, present, and future, that contribute to the impacts at issue. 40 C.F.R. § 1508.7. This requires a scope of analysis that will vary based on the impacts and resource that are being assessed.

Due to the major deficiencies in the SDEIS’ cumulative effects analysis, the Tribal Cooperating Agencies prepared their own. See SDEIS, Appendix C (Tribal

Cooperating Agencies Cumulative Effects Analysis). As explained by the Tribes, the SDEIS failed to consider their repeated requests to utilize a tool developed by the EPA in 2011 in cooperation with tribes entitled, “Applying Cumulative Impact Analysis Tools to Tribes and Tribal Lands.” This is despite the Mine Site and Plant Site, and resulting impacts, being located within the 1854 Ceded Territory, and upstream from the Fond du Lac Reservation. The Tribes thus undertook “a resource-specific GIS-based approach as defined in the 2011 guidance to generate an alternative [cumulative effects analysis] that more accurately accounts for cumulative impacts to resources of tribal significance.” *Id.* This improved and more detailed cumulative impacts analysis must be carefully considered by the agencies and disclosed to the public in the final EIS. *See e.g.*, 40 C.F.R. § 1502.24 (agencies must “insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements”); § 1502.9(b) (agencies must discuss in final EISs “any responsible opposing view”).

N. The Cumulative Analysis of Air Quality Impacts is Inadequate

1. The Cumulative Analysis of Regional Haze is Inappropriately Limited, but Nonetheless Indicates That This Facility Cannot Be Permitted

The analysis of regional haze begins by limiting itself to Class I areas in Minnesota. *See* SDEIS p. 6-82. The analysis must include all Class I areas that could be affected by the cumulative emissions of this and other projects. That would include at least Isle Royale. The analysis makes the further mistake of limiting the foreseeable projects that will have impacts on the Class I areas. The analysis must include all foreseeable projects that are likely to impact visibility in the Class I areas, regardless of where they are located. A cumulative impacts analysis must be based on impacts to the resource at issue, rather than on an arbitrary set of sources. *See* 40 C.F.R. § 1508.7 (“Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions *regardless of what agency (Federal or non-Federal) or person undertakes such other actions.*” (Emphasis added.)).

Furthermore, the SDEIS does not include all foreseeable sources even within the study area. The list of included project on SDEIS p. 6-81 does not include mining lease exploration activity. Drilling and other exploration activity can be a significant contributor to haze, especially in winter. Exploration activity has become very intense throughout the area immediately to the northwest of the NorthMet site, and is increasing in other nearby areas as well. This activity must be included in the haze analysis.

The entire analysis of this issue is built on the faulty premise that if reductions are made from some sources, additions will be acceptable from other sources. The point of the haze regulations is to *reduce* pollutants that affect visibility and most importantly to make reasonable progress on improving visibility in all affected Class I areas such that natural visibility conditions are attained by 2064. The amount of reductions from other facilities is not the relevant number by which to measure the impacts of the Proposed Project. Rather, the impacts must be measured against the visibility targets for all affected

Class I areas (including Isle Royale). If that target is unlikely to be met, the pollution from this project must be considered a contributor to a significant cumulative impact. Again, the proper measure under applicable law is not simply the pollutants from a particular source, but the impact on the Class I area.

The analysis attempts to describe the current situation with the Regional Haze State Implementation Plan (SIP). SDEIS 6-78. It fails to note, however, that the plan has been challenged in court due to its lack of stringency, and may well be invalidated. Furthermore, the analysis does not tell us what the SIP, the EPA Federal Implementation Plan, the Cross-State Air Pollution Rule, and the litigation involving them mean for this project and its impacts on visibility. For example, if the court challenge to the SIP is successful, stricter targets will need to be met.

The SDEIS reveals that current foreseeable reductions will not be enough to meet *even the plainly-insufficient goals of the challenged SIP*, and that “additional mitigation or reductions may be necessary.” Note again, the goals of the challenged SIP *do not* meet the requirement to meet natural conditions by 2064 and therefore there is no question that additional reductions will be necessary. It is inconceivable that the agencies could possibly find that the increase from the Proposed Project may be permitted under this scenario.

Remarkably, the entire cumulative impacts assessment never describes the actual impacts of haze on Class 1 area visibility, at current levels and at the levels we can expect based on the assessment of emissions levels. One can read the entire assessment and have no idea how much visibility has already been impacted in the national parks and wilderness areas, how much better or worse it will be with the projected reductions and increases, or how close that will come to pristine conditions. PolyMet and the agencies *must* model and discuss actual visibility impacts. Although emissions are a component of this analysis, emissions reductions do not result in a straight-line visibility impact, and cannot be used as a substitute for impacts on visibility itself.

SDEIS Tables 5.2.7-14 and -15 do show predicted incremental impacts on visibility on Class I areas from the NorthMet project alone. The text dismisses most of the values as insignificant, and downplays the significance of impacts on the BWCAW based on their short duration. What is missing from this discussion is the degree to which visibility is *already* impacted, and the current regulatory efforts and requirements to further *reduce* those impacts. Allowing any additional impact is very clearly a step in the wrong direction.

Furthermore, we disagree that “PM₁₀ emissions are not considered to be a concern for visibility impairment in the BWCAW or Voyageurs National Park,” SDEIS 6-83 (and we reiterate that other potentially affected Class I areas must be included in the analysis). It is alarming to learn that considering only the projects that the agencies deem foreseeable, and including reductions, a *net increase* in PM₁₀ emissions is predicted; the SDEIS needs to provide more information on how this could affect haze and what it means in regard to regulatory requirements.

Paragraph 5 of the summary on SDEIS 6-86 is poorly worded, and needs to be clarified. “Based on current projections including the NorthMet Project Proposed Action, the reductions addressed in this section are not projected to be enough to meet the 2018 goal.” That much is clear. Does “The reductions would be enough to meet the 2012 goal” mean that they would be enough even if NorthMet was operating? If not, would the goal be met *with* the NorthMet project? And at what point in time would the goal be met? The year 2012 has already passed; has the goal in fact been met? If we have not yet met the 2012 goal, it is unclear how this project could be permitted.

Nor should this facility be permitted if it will contribute to non-attainment of the 2018 goal. Even if everything went smoothly from here on out – and there is no doubt based on this SDEIS that it will *not* go smoothly – the earliest possible year to begin construction would be 2015. The mine plan contemplates a three-year construction phase. Even if mining and processing began before construction ended, it is highly unlikely that the primary sources of air emissions would be in operation before 2018. And even if they theoretically could be, not taking account of an immediately pending goal defies common sense.

2. The Assessment of the Impacts of Criteria Air Pollutants Is Inadequate

The NorthMet Proposed Project would emit 700 tons per year of particulate matter-10, SDEIS Table 5.2.7-5, which is quite a substantial amount of a pollutant with already existing impacts on human health. Yet the SDEIS completely fails to tell us about the health impacts of breathing PM10, or the degree to which the Proposed Project would add to existing levels.

Table 5.2.7-10 and Table 5.2.7-11, both at SDEIS 5-410, require explanation. The tables appear to include the same information for different purposes. However, although the SO₂ and NO₂ values are the same, the values for PM are very significantly reduced in Table 5.2.7-10, with no explanation. If this is due to the evaluation location (the property line for Table 5.2.7-10 and an undisclosed location for Table 5.2.7-11), the SDEIS needs to discuss the impacts of this level of particulate matter for workers at the site.

The SDEIS includes many pages of discussion about regulatory requirements and why the project will not violate them, but it gives no information whatsoever about the impacts of emissions of criteria pollutants from the Proposed Project on human health. While EIS requirements include a discussion of whether regulatory requirements will be met, that is not the primary point. The point is to describe environmental impacts, whether they are otherwise regulated or not. Regulatory standards are very often compromises that allow some amount of impact in order to accommodate industry. They are generally not cut-off points below which no impacts will occur.

The cumulative assessment provides a comparison of criteria pollutants from the Proposed Project and other local sources to ambient air standards in Table 6.2-17. The

SDEIS also provides figures showing predicted exceedances of SO₂ and NO₂ standards, SDEIS Figures 6.2.3-4 and 6.2.3-5, apparently designed to illustrate that all exceedances are caused by someone else. While the figures do illustrate a shocking level of exceedances due to taconite facilities, it nonetheless also appears that the NorthMet project is likely to have some impact from the emission of NO₂, as ambient levels approach the regulatory standard.

Of particular concern is that the analysis completely omits discussion of particulate matter, apparently because it is not modeled to exceed the standard at any receptor. It does, however, come close, at 34 ug/m³ compared to the standard of 35 ug/m³. Particulate matter is likely to have an impact at this level, and it would be instructive to see a modeled receptor map showing where this impact would occur. A review of health effects of particulate matter, Anderson, Jonathan O., Josef G. Thundiyil, and Andrew Stolbach, "Clearing the Air: A Review of the Effects of Particulate Matter Air Pollution on Human Health," J. Med. Toxicol. (2012) 8:166–175 (2012) is included as Exhibit 51.

More generally, the entire cumulative impacts analysis for criteria pollutants is improperly limited to the grid around the site, rather than considering incremental additions to more regional problems. Most of the state of Minnesota has just experienced a health advisory warning from MPCA due to high levels of particulate matter. MPCA, "Eastern two-thirds of Minnesota placed under air pollution health alert" (March 7, 2014) (Ex. 52) accessed at <http://www.pca.state.mn.us> on March 8, 2014. We reiterate that it is alarming to learn that a net cumulative increase in PM10 emissions is predicted, even with planned reductions from any facilities. The SDEIS must disclose contributions from the Proposed Project to the projected increase, and what that means for human health both locally and in downwind areas.

O. The Discussion of Greenhouse Gas Emissions is Inadequate

One of the most problematic issues in regard to this and other new mining projects in Northern Minnesota is the impact on global climate change. The SDEIS reveals that this project would represent 0.44 percent of Minnesota's greenhouse gas emissions. SDEIS 5-430. This is an enormous amount for one facility, especially a facility that intends to employ only about 0.012 percent of Minnesota workers.

The SDEIS also describes regulatory efforts to limit greenhouse gas emissions. It does not, however, relate this proposed increase to those efforts. It also neglects to address several factors that will add to this project's impact on global warming.

1. The SDEIS Does Not Discuss Minnesota's (Lack of) Progress Toward its Reduction Goals or This Project's Impact on the Meeting of Those Goals

The SDEIS states that Minnesota has established a greenhouse gas emissions reduction target of 15 percent by 2015. What it does not tell us is that Minnesota will not come close to meeting this goal. See MPCA and Minnesota Dept. of Commerce, "Greenhouse Gas Emissions Reduction: Biennial Report to the Minnesota Legislature"

(Jan. 2013) (Ex. 47). It is absolutely unconscionable for the State of Minnesota to consider permitting the level of increase in emissions at issue here, in light of our commitments to global welfare. The SDEIS describes the new MPCA rules and environmental review requirements, but apparently these things will be of no effect when it actually comes down to saying “no” to increased emissions.

2. The SDEIS Does Not Discuss the Sequestration of Carbon in Peatlands, or the State Policy of Preserving Peat Lands for That Reason

Although the SDEIS appears to include the loss of terrestrial carbon sequestration in its assessment of greenhouse gas emissions, the number used for this source of greenhouse gases is puzzling. A 2008 report to the DNR states, “A single acre of peatland contains, on average, 750 metric tons of C. Total emission of the carbon contained in just 1,000 acres of peatland would increase Minnesota's 2005 CO₂ emissions by almost 2%.” Anderson, Jim, et al., “The Potential for Terrestrial Carbon Sequestration in Minnesota” (February 2008) (Ex. 14). The total amount of terrestrial carbon loss reported in Table 5.2.7-9 of the SDEIS is 199,963. This would amount to a loss of 266 acres of peatland if no other losses were counted. However, the SDEIS states that “Most of the wetland vegetation present at the Mine site (69 percent) is indicative of acid peatland systems.” It appears that significantly more than 266 acres of peatland will be destroyed. We thus question whether the protocols used to estimate greenhouse gas emissions underestimate impacts from the destruction of peatlands.

Furthermore, the SDEIS does not discuss the important role these lands play in long term sequestration of carbon. The value of the lands for that purpose will be permanently lost; we cannot recreate this resource. Friends of the Boundary Waters Wilderness commented extensively on state policy in regards to peatlands in its scoping comments on the USFS land exchange, comments that are worth repeating here:

Peatlands are wetlands that form over hundreds and thousands of years. They consist of the decayed remains of plants, accumulating in stagnant, low-oxygen conditions that prevent the normal decomposition of vegetation. . . . Peatlands are important terrestrial environments in the sequestration of carbon that would otherwise contribute to climate change. The destruction of peatlands can release large quantities of previously sequestered CO₂ into the atmosphere.

. . . .

Scientists have calculated that the loss of 1,000 acres of Minnesota peatlands translates to a release of approximately 2.7 million metric tons of CO₂ to the atmosphere. . . . PolyMet’s impacts on Minnesota’s carbon emissions are likely to be close to this level, given their peatland impacts are nearly 900 acres and perhaps higher.

In 2007, the Minnesota State Legislature requested that the University of Minnesota produce an assessment of the potential capacity for carbon sequestration in Minnesota's terrestrial ecosystems. The Minnesota Terrestrial Carbon Sequestration Project, an interdisciplinary research group, was organized to produce that assessment. The team analyzed existing scientific literature, land existing in broad land use categories, and the role of current state policies and programs on carbon sequestration potentials. In February 2008, the Project produced a report titled, "The Potential for Terrestrial Carbon Sequestration in Minnesota." Some of the key findings and recommendations of that team of researchers are:

- Peatlands in Minnesota contain the largest carbon stocks in the state, in excess of 4 billion metric tons
- Release of this carbon to the atmosphere as CO₂ can result from peatland drainage and conversion
- Release of this carbon to the atmosphere would accelerate global warming and require greater reductions in CO₂ emissions elsewhere
- Destruction of 1,000 acres of peatland in Minnesota from mining or other activities would increase the state's total CO₂ emissions by 2% over 2005 levels

The top recommendation of this research group: "Preserve the existing large carbon stocks in peatlands and forests by identifying and protecting peatlands and forests vulnerable to conversion, fire, and other preventable threats" (Anderson et. al 2008).

In December 2006, Governor Tim Pawlenty announced the state's "Next Generation Energy Initiative," including the development of a comprehensive plan to reduce Minnesota's emissions of greenhouse gases. The Minnesota Climate Change Advisory Group, a broad-based group of Minnesota citizens and leaders, was created to develop state-level policy recommendations to the Governor. In April 2008, the Advisory Group released its report titled, "Minnesota Climate Change Advisory Group Final Report: A Report to the Minnesota Legislature." [Ex. --] Some of its key findings and recommendations include:

- "Wetlands have among the highest potential carbon-sequestration capacities for any type of land cover in Minnesota. Peatlands are likely Minnesota's largest single carbon sink, containing 37% of all carbon stored in the state..."
- Recommendation: "Protecting these enormous carbon reservoirs (peatlands)...is critical."

The policy goals from the Advisory Group included:

- Protect and restore northern peatlands.

- By 2015, identify peatlands at risk of releasing greenhouse gases because of lowered water table or industrial uses such as mining.
- Design policies to protect peatlands and wetlands from drainage and other carbon- releasing land uses.

Betsy Daub, Friends of the Boundary Waters Wilderness, Letter to James Sanders (Nov. 23, 2010), Ex. 4. These state recommendations and policies and the inconsistency and impact of permitting the Proposed Project must be discussed in the SDEIS.

4. The Project Will Have Other Additional Greenhouse Gas Emission Impacts that are not Included in the Analysis

The inventory of greenhouse gas emissions does not appear to include increased emissions from transportation to and from the mine and plant sites. This site is in a relatively remote location, and will necessitate a great deal of transportation of both materials and workers. SDEIS Table 3.2-13 lists shipments of various materials; the greenhouse gas emission impacts should be included for these shipments from their place of origin, not just from Duluth. In addition, the SDEIS assumes that workers will commute long distances for jobs at the site. This assumption also needs to be included in the assessment of greenhouse gas emissions.

In addition, some of the processing of these metals will be done in other locations. Earlier estimates of air emissions have been reduced due to this factor, in essence exporting the air pollution impacts to another location. In regards to global pollutants like greenhouse gases and mercury, these impacts must be included in the EIS for the project. The cumulative impacts of these emissions when added to other global sources of pollution will add to the impacts in Northeastern Minnesota just as they would if they were emitted locally. They will also add to the load affecting the entire planet regardless of the emission location.

5. The SDEIS Fails to Consider Alternatives That Would Mitigate Greenhouse Gas Emissions

At the very least, PolyMet, the Co-Lead Agencies, and the SDEIS need to consider an alternative energy source. All of the electric power for this project would come from burning coal. At this point in the human experiment with technology, it is time to simply stop permitting projects that will increase the burning of coal.

In addition, according to the SDEIS, several alternatives that would decrease greenhouse gas emissions (albeit by minor amounts) were considered and rejected by PolyMet. SDEIS 5-433. At least one of the alternatives was rejected on the basis of cost alone; the reference document indicates that an electric tram system for haul trucks would not be considered unless it would be less expensive than diesel power, which emits more greenhouse gases. See Barr 2012s., Att. A.

The Co-Lead Agencies need to consider these alternatives themselves, and include them in the SDEIS if they would provide environmental benefits. Under NEPA, the consideration of alternatives is not driven by what the project proposer is willing to do. The Co-Lead Agencies must examine the project objectively and independently to determine whether the applicant could do more to reduce environmental impacts, and must deny the necessary authorizations if they find that it could. Allowing PolyMet to be the driver of this process negates the entire purpose of the alternatives requirement.

P. The SDEIS Does Not Adequately Factor In the Impacts of Climate Change

For almost every resource that will be impacted by the Proposed Project, the SDEIS fails to account for the impacts of climate change. From water levels in rivers, streams, and wetlands, to the intensity of storms and amounts of precipitation, to the impacts of a warmer climate combined with air pollution and air deposition rates, the SDEIS is silent. The reality is that this project would not take place within an environment that matches existing conditions. Rather, it would take place within an environment with a notably different climate.

Providing a note of this while not stating what the actual effect of the changing climate will be, *see* SDEIS 5-430, is not sufficient to cover every issue in the SDEIS. For some of the resources at risk, it is at least predictable that the differences will be significant and that they will move in a particular direction. For example, we know that many ecosystem types and plant communities are in decline due to global warming. This project will contribute to that decline by destroying many acres of these very ecosystems and communities. We know that the warming climate will increase the impacts of the deposition of air pollutants on lakes; this project will contribute to the impacts by increasing those pollutants. For these and other impacts with a foreseeable climate change component, the SDEIS must include this factor in its discussion of impacts.

Q. The Discussion of Health Risks From Mineral Fibers is Inadequate

The SDEIS notes that, “the potential exists for the release of amphibole mineral fibers from the proposed operations, which could pose a potential public health risk of uncertain magnitude.” SDEIS 5-439. Section 5.2.7.5.3 assesses “the likelihood of exposures to airborne amphibole mineral fibers from the proposed mining and processing operations,” *id.* at 5-440, and concludes the risk is “not zero” but “very low” based on proposed control measures. *Id.* These comments challenge this conclusion.

Both PolyMet and earlier investigators have found amphibole material in the area PolyMet seeks to mine. This amphibole can include fibers that produce health effects. Such fibers are also generated when the material is ground and processed as PolyMet plans to do. SDEIS Section 5.2.7.5 and its supporting documents try to explain this away, saying the fibers are not true asbestos and wouldn’t cause health harms. In fact, the history of taconite mining in Minnesota and mining in other places proves that fibers deemed “not asbestos” by some experts can sicken and kill humans in large numbers. That is just what could happen if PolyMet is allowed to mine in the Duluth Complex.

1. There is Real Potential for Health Effects if the Duluth Complex is Mined

The Expert Statement of Steven J. Ring, Attached and included as Exhibit 52, describes the presence of amphibole fibers in the Duluth Complex where PolyMet proposes to mine. Mr. Ring has direct knowledge regarding the amphibole fibers in the Duluth Complex. Mr. Ring worked for the Minnesota Department of Health (MDH) for over 35 years. Ex. 52 at 1. From 1986 to 1994, he supervised the MDH Public Health Laboratory's Microparticulate Analysis Unit. *Id.* While working at this lab, he participated in Robert Stevenson's study of the Duluth Complex by analyzing fibers from the Duluth Complex (along with Stevenson and others) with an electron microscope. *Id.* at 5. Mr. Ring also has direct experience with fibers from the adjacent Biwabik Formation, including field investigation in the Peter Mitchell Pit, which is close to the proposed Mine Site. *Id.* at 10.

Mr. Ring explains that as part of the Minnesota Environmental Quality Board's Regional Copper-Nickel Study, Mr Stevenson found amphibole fibers in the Duluth Complex – including from the Partridge River Intrusion, which PolyMet seeks to mine. *Id.* at 4. Stevenson compared the amount of fibers identified in his study to reported fiber counts from the Biwabik Formation; Stevenson's conclusion was that the Duluth Complex has 1/3 the fibers as the does the Biwabik. *Id.* at 5. Stevenson also notes the similarity of the formation of amphibole minerals in the Biwabik and Duluth Complex: both can have the same type of sharp, pointed crystals. *Id.*

Mr. Ring describes Stevenson's methodology. Stevenson chose typical ore samples from five separate locations where mineralization occurs in the Duluth Complex. *Id.* at 4, 8-9. The samples were used for mineralogical analysis and testing of copper and nickel extraction methods. *Id.* at 4-5. Within one of the process samples, he found an asbestiform mineral, *id.* at 8-9, but he also found other amphibole material that yielded fibers when processed. *Id.* at 5. The asbestiform sample was in a mafic pegmatite and Stevenson notes that, "[o]ccurrences of mafic pegmatites are ubiquitous in the troctolitic rocks of the Duluth Complex." *Id.* at 9. Thus, it is possible that other asbestiform materials would be found in the mafic pegmatites that are ubiquitous in the Duluth Complex. Moreover, as Mr. Ring points out, the amount of amphibole found in the Duluth Complex is highly variable. *Id.* at 5, 7-9. Stevenson's 1/3rd number is an estimate based on an average and the amount of amphibole mined will depend on the actual mining location, and the resulting fibers could be considerably higher than 1/3rd of the fibers found in the Biwabik Formation.

The suggestion that fibrous materials could be found throughout the Duluth Complex is supported by the work of Mark J. Severson and Steven A. Hauck, "Geology, geochemistry, and stratigraphy of a portion of the Partridge River Intrusion, Tech. Rep. NRRI/GMIN-TR-89-11 (March 1990) (Ex. 56), which Mr. Ring describes in his statement. Ex. 52 at 9-10. Severson and Hauck analyzed the Partridge River Intrusion, which is a feature of the Duluth Complex and includes the area PolyMet seeks to mine.

Id. Severson and Hauck found areas of alteration in troctolite (a mafic intrusive rock type) that contained “fine-grained mats of radiating bundles,” which sound very much like fibrous material. *Id.* at 9.

The information and opinions from Mr. Ring’s statement must be disclosed and addressed in the Final EIS. An EIS must disclose and respond to “any responsible opposing view.” 40 C.F.R. § 1502.9(b); *see also Seattle Audubon Society v. Moseley*, 798 F. Supp. 1473, 1479 (W.D. Wa. 1992), *aff’d Seattle Audubon Society v. Espy*, 998 F.2d 699 (9th Cir. 1993) (“[a]n EIS that fails to disclose and respond to ‘the opinions held by well respected scientists concerning the hazards of the proposed action ... is fatally deficient.’”); *Earth Island Institute v. U.S. Forest Service*, 442 F.3d 1147, 1172-73 (9th Cir. 2006) (FEIS failed to respond “explicitly and directly” to conflicting views, and agency violated NEPA requirement to take a hard look and provide a full and fair discussion allowing informed public participation and decision-making). The emission of toxic fibers by the mining industry has been a concern in Northeastern Minnesota for decades, and yet we continue to be told that insufficient information exists to indicate a significant risk to human health. The public and decision makers must be given the countervailing viewpoint so that they can judge the veracity of this claim.

Because dramatic health effects are now associated with mining in the Biwabik, if even a third of the level of fibers found in the Biwabik would appear in the Duluth Complex, mining in the Duluth Complex could lead to substantial health effects.

In 2007 the MDH determined that there have been 58 cases of mesothelioma among Minnesota iron miners since 1988 when it initiated the Minnesota Cancer Surveillance System, which tracks this information. MDH, *Mesothelioma in Northeastern Minnesota and Two Occupational Cohorts: 2007 Update 2* (December 2007) (Ex. 57). In its 2013 report to the Minnesota Legislature, the University of Minnesota School of Public Health and the Natural Resources Research Institute (NRRI) presented findings from their ongoing Taconite Workers Health Study (Ex. 58). They found that in Iron Range Communities mesothelioma was present nearly 200% higher than expected. Ex. 58 at 5. Lung cancer was higher than expected by 20% and heart disease by 11%. *Id.* All three of these harms were elevated in each of four geologic zones of the Iron Range. *Id.* Furthermore, the study found that the iron mining worker population of northeastern Minnesota has elevated rates of death from all causes combined, all cancers combined, lung cancer, mesothelioma, and heart disease. *Id.* at 25. Finally, this assessment revealed that the longer people worked in the taconite industry, the higher their risk for mesothelioma. The risk went up by about 3% per year worked for those with more, compared to those with less, work time. *Id.* at 6.

Even assuming a lesser risk based on Stevenson’s estimate that the Duluth Complex contains one-third the amount of fibers as the Biwabik Formation, these numbers are alarming. If mining in the Duluth Complex might yield a third of this harvest of death and illness, the PolyMet proposal should be rejected.

2. The SDEIS Relies on Flawed Assumptions Regarding the Potential Health Effects from Exposure to Amphibole Fibers

SDEIS Section 5.2.7.5 relies on Polymet's consultant report regarding fibers, Barr Engineering, *Fibers Data Related to the Processing of NorthMet Deposit Ore* (June 2007) (Barr 2007m). The Fibers Report takes the position that fibers in the Duluth Complex are not true asbestos (not asbestiform in shape) and, thus, not harmful. This argument has several components. First, the Report suggests that, based on a "fibrosity index" test, the fibers found in its sampling and that of Stevenson are not asbestiform. Next, the Report suggests the fibers are harmless "cleavage fragments." These claims are incorrect and misleading.

The Report argues the fibers that would be generated by mining the Duluth Complex would not be asbestiform, and thus would not be harmful based on a review of fibers identified in its sampling and Stevenson's earlier work regarding the Duluth Complex. This argument centers on a "fibrosity index" developed by University of Maryland researcher Ann Wylie. The Report cites to "Wylie. 1978. Fiber length and aspect ratio of some selected asbestos samples. NYAS workshop No. 1." regarding the fibrosity index, a document which is not part of the record. However, the same concept is outlined in Dr. Wylie's "Fiber Length and Aspect Ratio of Some Selected Asbestos Samples," 330 *Annals of the N.Y. Acad. of Sciences* 605–610 (1979) (Ex. 59).

The fibrosity index turns out to be based on an analysis of only four samples of asbestos material. Ex. 59 at 605. Far from establishing a confident yardstick, Wylie notes that, "[f]urther testing of this model is required before its validity as a reliable measure of fibrosity can be established." *Id.* at 610. In fact, Wylie describes this limited data set as demonstrating, "that most asbestos fibers longer than 5 um in length are characterized by aspect ratios in excess of 20:1." *Id.*

There is no reasonable basis for using the fibrosity index here, where the key question is the potential health effects of fibers from the Duluth Complex. Not only is the Wylie fibrosity index based on a tiny sample, with the author stating that further testing is required, but no agency currently uses this thirty-six year old approach. Furthermore, EPA has specifically rejected the notion that a 20:1 aspect ratio – which is essentially what the fibrosity index uses as its yardstick -- is required for a fiber to be deemed harmful to health.

In September 2003, the EPA received a petition under the Superfund Law to assess asbestos exposure at public areas in El Dorado Hills, CA. The petition was prompted by discovery of asbestos in the soil at the high school. The National Stone, Sand & Gravel Association (NSSGA) provided analysis prepared by the R.J. Lee Group (a private consulting firm) that argued that the material in El Dorado Hills is not asbestos but rather is harmless rock fragments or cleavage fragments. The R.J. Lee Group also stated that EPA's definition of asbestos requires a 20:1 aspect ratio. In EPA's response to the R.J. Lee Group document, the Agency flatly rejected that claim as well as the notion that a 20:1 aspect ratio is a dividing line between harmful fibers and benign ones:

To support this claim, the R.J. Lee Report cites the glossary of “Method for Determination of Asbestos in Bulk Building Materials”, EPA 600/R-93/116, 1993, which states, in part, “With the light microscope, the asbestiform habit is generally recognized by the following characteristics: Mean aspect ratios ranging from 20:1 to 100:1 or higher for fibers longer than 5 microns.” The building material analytical method is designed to detect commercially processed asbestos in items like floor tiles, roofing felts, paper insulation, paints, and mastics, not naturally occurring asbestos on air filters or in soil samples. **To present the 20:1 aspect ratio for commercial grade asbestos as a universal EPA policy, and to advocate its use as an appropriate standard for analyzing air samples of naturally occurring asbestos is inappropriate** and contradictory to use of the PCME dimensional criteria [EPA's current health risk counting methodology] as a tool for assessing exposure risk..

U.S. EPA, Response to the November 2005 National Stone, Sand & Gravel Association Report Prepared by the R.J. Lee Group, Inc. "Evaluation of EPA's Analytical Data from the El Dorado Hills Asbestos Evaluation Project" 7 (April 20, 2006) (emphasis added) (Ex 60) [hereinafter "EPA El Dorado Response"].

In other words, the R.J. Lee Group took out of context an EPA method used for bulk characterization of commercial asbestos varieties in building materials. It is especially troubling that Section 5.2.7.5 and the PolyMet Fibers Report also make the fallacious claim that EPA's definition of asbestos requires a 20:1 aspect ratio. SDEIS 5-435; Barr 2007m at 1, 25. Worse than that, PolyMet used the R.J. Lee Group to analyze its flotation samples for asbestos content using polarized light microscopy (PLM). Barr Engineering, Appendix B Attachment 2 RS51 Draft – 02 Environmental Sampling and Analysis Flotation Process Liquids and Solids Sampling Results Pilot Test – NorthMet Deposit PolyMet Mining, Inc. RS32 Part 1 (May 2006) (Ex. 61). Unsurprisingly, the R.J. Lee Group used the same EPA bulk material method to analyze the samples that EPA specifically rejects in its El Dorado Hills response. *Id.* at 9. Apparently, the Polymet tailings PLM analysis spuriously deemed any fibers that had an aspect ratio of less than 20:1 to be non-asbestos.

The best proof that fibers that might not meet a strict definition of asbestos can be harmful to health is Libby, Montana. W.R. Grace owned and operated a vermiculite mine and associated processing facilities in and near Libby, Montana from 1963 until 1990. Amphibole asbestos is located in and near the vermiculite ore in the Libby deposit. As a result of the mining activities in Libby and the processing of Libby vermiculite, asbestos contamination spread to many other locations. In 1999 EPA began investigating asbestos contamination at numerous locations in and near Libby, and soon after commenced cleanup actions. During the cleanup process W.R. Grace submitted comments to the EPA, based on an R.J. Lee Group report, to the effect that, “[a]pproximately 74 percent of EPA's analytical results include the improper counting of cleavage fragments. Cleavage fragments do not contribute to risk and are forbidden to be

counted by applicable regulations.” United States’ Statement Regarding Asbestos Analysis Issues in W.R. Grace’s Motion for Summary Judgment and Claimants’ Motion to Exclude Dr. R.J. Lee’s Opinion on Cleavage Fragments (Docket Numbers 4009 & 4022) at 4, In re W.R. Grace & Co., No. 01-01139 (Bankr. D. De. August 7, 2003) (Ex. 62).

EPA disputed the claim in the above case, but what was not disputed was the death toll at Libby. An analysis of mortality conducted by the Agency for Toxic Substances and Disease Registry (ATSDR) in Libby for the period 1979-1998 found mortality in Libby resulting from asbestosis was approximately 40 to 60 times higher than expected. ATSDR, Mortality from Asbestosis in Libby, Montana (2000) (Ex. 63), accessed at <http://www.atsdr.cdc.gov/hac/pha/pha.asp?docid=1225&pg=3#conc> on March 11, 2014. An agency study of 7,307 Libby residents (6,668 received chest X-rays) found that, “[t]he factors most strongly associated with pleural abnormalities (lung abnormalities related to asbestos exposure) were being a former W.R. Grace worker, being older, having been a household contact of a W.R. Grace worker, and being a male.” Lucy Peipins et al., *Radiographic Abnormalities and Exposure to Asbestos-Contaminated Vermiculite in the Community of Libby, Montana, USA*, Vol. 111, No. 14 Env. Health Perspectives 1753 (2003) (Ex. 64).

Perhaps it is no coincidence that the SDEIS, the PolyMet Fibers Report, and W.R. Grace’s contractor at Libby (R.J. Lee) have all claimed that the fibers at their respective sites are largely harmless cleavage fragments. In the Libby case, whatever definition should be applied, the fibers were far from harmless.

Some have argued that the deaths at Libby are not relevant to other sites because the Libby amphibole is somehow unique. However, a recent study shows that the Libby amphibole is not more toxic than other types of asbestos. The study is Kelly Duncan et al., *In vitro determinants of asbestos fiber toxicity: effect on the relative toxicity of Libby amphibole in primary human airway epithelial cells*, Particle and Fibre Toxicology 2014, 11:2 (Ex. 65). The study compared Libby amphibole to two standard reference samples of amosite, which is a trade name for grunerite asbestos, an amphibole mineral. *Id.* at 2. This means Libby asbestos is not somehow different from all other fibers. Thus, lessons learned from Libby – that fibers deemed non-asbestos can be deadly – must be applied to PolyMet’s proposal.

Similar lessons can be learned right next door to the proposed PolyMet site. In the Peter Mitchell Pit, part of a taconite mine exploiting the Biwabik Formation (directly adjacent to the Duluth Complex and the proposed PolyMet mine site), elongated fibers have been found that pose a serious health threat, yet geologists have deemed the fibers not asbestos.

A 1982 paper co-authored by EPA scientist Philip Cook found that a ferroactinolite sample from the Peter Mitchell Pit was more carcinogenic than a reference amosite sample. Philip Cook et al., *Interpretation of the Carcinogenicity of Amosite Asbestos and Ferroactinolite on the Basis of Retained Fiber Dose and Characteristics in*

Vivo, 13 Toxicology Letters 151 (1982) (Ex. 66) [hereinafter Cook PMP Analysis].

The amosite sample is identified as a standard Union Internationale Centre le Cancer (UICC) sample in a companion paper, David Coffin, *Tumorigenesis by a Ferroactinolite Mineral*, 13 Toxicology Letters 143, 144 (1982) (Ex. 67) [hereinafter Tumorigenesis Paper]. The ferroactinolite sample is identified as being from the Peter Mitchell Pit in slide 27 of an undated Philip Cook PowerPoint presentation attached hereto as Exhibit 68.

Similar to the debate at Libby over whether the toxic fibers were asbestos or not, geologists analyzed samples from the Peter Mitchell Pit after the Cook paper was published and concluded that no asbestos was present. Malcom Ross et al., *The Search for Asbestos Within the Peter Mitchell Taconite Iron Ore Mine, near Babbitt, Minnesota*, 52 Regulatory Toxicology and Pharmacology S43 (2008) (Ex. 69) [hereinafter PMP Search]. Specifically, the geologists examined samples from the pit including from the ferroactinolite material used by Cook et al. in the 1982 paper noted above, and concluded that, “[t]his fibrous ferroactinolite is a low temperature alteration product of non-fibrous amphibole; it does not occur in the manner of true asbestos which crystallizes as a primary mineral from hydrothermal solutions into open veins within deformed rock.” *Id.* at S49. It is thus clear that fibers do not have to be “asbestos” to be toxic.

As explained above, the assertion in the PolyMet Fibers Report that EPA requires a 20:1 aspect ratio for a fiber to be deemed asbestos is flatly incorrect. EPA has specifically rejected an identical mining industry claim regarding El Dorado Hills, CA. The 20:1 aspect ratio used in the PolyMet Fibers Report, via the Wylie fibrosity index, should not be used as a determinant of the potential for health effects from a given fiber. In addition, the results from Libby and the Peter Mitchell Pit – where fibers that arguably fail a strict test of what constitutes asbestos still prove deadly – amply demonstrate that such narrow definitions are irrelevant to whether public health will be at risk.

The companion argument in the PolyMet Fibers Report (as it was at Libby) is that the fibers are cleavage fragments, which are asserted to be not harmful. In fact, there is no basis for this assertion.

The subject of health effects of cleavage fragments came up in a hearing held by the House Energy and Commerce Committee's Subcommittee on Environment and Hazardous Materials. The topic of the hearing was proposed legislation that would have banned all asbestos materials with one percent or greater percentage of asbestos by weight. Some witnesses testified that the definition of asbestos should exclude cleavage fragments.

This argument was addressed by Dr. Richard Lemen, a retired Assistant Surgeon General and former Deputy Director of the National Institute for Occupational Safety and Health (NIOSH). Dr. Lemen holds a Ph.D. in Epidemiology from the University of Cincinnati, is an Adjunct Professor at the Rollins School of Public Health at Emory University, is an expert consultant to the Director General of the World Health

Organization, and is a past president of the Society for Occupational and Environmental Health. Dr. Lemen stated:

The cleavage fragment of a mineral is comprised of the same chemical composition as the form of the mineral defined by shape as a fiber. Cleavage fragments, in the form of dust, are as readily inhaled as a fiber of the same mineral. The finding of disease including mesothelioma in both New York talc miners and Minnesota iron miners where cleavage fragments were at issue confirm their need for inclusion in the asbestos ban bill.

Keep in mind that the potential for diseases to occur from inhalation of fibrous dust or any dust is not just related to its shape. To the contrary, most dust-induced diseases are due to the inhalation of non-fibrous dusts. Certainly fibrous dusts carry some risk for inducing disease once inhaled by virtue of their shape. However increasing numbers of publications have shown that various features associated with the surface and chemical features of inhaled dusts can trigger deleterious chemical events in biological systems such as the formation of charged chemical structures – radicals as well as immune responses that are shown to be harmful to cells in the body

...

The fact [is] that, much more is now known about the mechanisms of disease induction from breathing fibrous forms of a given dust since many of the fibrous forms are used in commercial products where human exposures are defined. However, in reality many fibrous dusts of amphibole minerals also contain cleavage fragments of the same mineral. Thus, distinguishing the potential “the various shapes of the inhaled dusts offer,” as individual “contributors” to induction of disease from such mixed exposures are difficult to distinguish. The debate as to the distinction of a short fiber from a cleavage fragment, as seen in the light microscope, shouldn’t be confused with health related issues. We do not know what fractions of those mixed dusts are capable of being inhaled and their roles individually or cumulatively may act as contributors to the development of disease in man.

S. 742 And Draft Legislation to Ban Asbestos in Products, 110th Cong. 121-23 (2007) (testimony of Dr. Richard Lemen) (footnotes omitted) (Ex. 70) [hereinafter House Hearing].

As noted above, the cleavage fragment argument was also raised by industry regarding El Dorado Hills. In EPA’s response to the R.J. Lee Group report the Agency stated:

It is the position of EPA, the U.S. Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry (ATSDR) and National Institute for Occupational Safety and Health (NIOSH), and the American Thoracic Society, among others, that microscopic structures of amphibole and serpentine minerals that are asbestiform and meet the size definition of PCM fibers [measured asbestos fiber concentrations using phase contrast microscopy], should be counted as asbestos, regardless of the manner by which they were formed. There are four reasons why the health agencies have taken this position: (1) The epidemiologic and health studies underlying EPA, and California EPA, cancer risk assessment methods were based on exposures to both cleavage fragments and fibers, but were unable to distinguish between the two, (2) The most recent panel of experts to review asbestos risk assessment methods, the 2003 Peer Consultation Panel convened by EPA, concluded that “it is prudent at this time to conclude equivalent potency [of cleavage fragments and fibers] for cancer,” (3) No well-designed animal or human epidemiological studies have been conducted to date to test the hypothesis that cleavage fragments with the same dimensions of a fiber are benign, or that the human body makes any distinction, and studies that purport to show that cleavage fragments are benign are questioned by many asbestos health experts, (4) There are no routine air analytical methods, including those used by EPA, NIOSH, the Mine Safety and Health Administration (MSHA), the American Society for Testing and Materials (ASTM), and the ISO which differentiate between cleavage fragments and crystalline fibers.

EPA El Dorado Response (Ex. 60) at 11. Thus, EPA, ATSDR, NIOSH, the American Thoracic Society and leading epidemiologists reject the claim that cleavage fragments cannot cause health effects.

Research data also support the notion that small fibers can cause health effects. The Cook PMP Analysis (cited above) found that fibers splitting into smaller pieces can increase the potential for health risk. The study found that the ferroactinolite samples from the Peter Mitchell Pit (and to a lesser degree, the reference amosite sample) over time in the rat lung split into thinner and often smaller pieces. Ex 66 at 156. The authors concluded, “that the number of very thin fibers of all lengths present in tissue is a better determinant of fiber carcinogenicity than the number of long fibers.” *Id.* The Tumorigenesis Paper, which involves the same experiment, provides a similar explanation: it notes that the Peter Mitchell Pit ferroactinolite caused many more cancerous lung tumors when compared to the reference amosite sample than would have been expected based on the higher initial aspect ratio of the amosite. Ex. 67 at 149. The paper concludes: “[t]he most probable explanation of these incongruities is in vivo [in the rat] splitting of fibers in the lung. This phenomenon increased the number of fibers and aspect ratio thus increasing the dose during the residence in the lung.” *Id.*

This suggests that for elongated fibers, total fiber surface area may be more

determinative of health outcomes than aspect ratio alone or whether a fiber was produced by cleavage or other mechanism. In the Libby Amphibole Toxicity study discussed above, Libby amphibole was compared to two reference amosite samples. The amosite samples had more harmful effects on human airway cells than the Libby amphibole samples when doses of equal mass were used. Ex. 65 at 2-6. However, when the data was reanalyzed to account for the larger surface area of the amosite samples, the difference in toxicity was significantly reduced. *Id.* at 7-8, Figure 6. The researchers also looked at the impact of the number of particles and the surface chemistry of the samples, *id.* p. 7-9, but neither factor had the same predictive power as the total surface area. *Id.* p. 7-11. The researchers also noted that, when the results are normalized for surface area and particles with an aspect ratio below 3:1 are removed, much of the difference between the amosite and Libby amphibole is reduced. *Id.* p. 7-10 (compare figures 6A and B). The conclusion: (1) for elongated fibers the total surface area is the factor that best explains the difference in measured health effects between the samples and (2) the results of removing from the analysis fibers with an aspect ratio of less than 3:1 suggests “that elongated mineral particles are more significant contributors to the proinflammatory response than non-elongated particles.” *Id.* pp. 8, 10.

This conclusion is a far cry from the position taken in the PolyMet Fibers Report that only fibers with an aspect ratio of 20:1 or greater are of concern. Clearly if surface area is the key determinant of health effects – not aspect ratio alone or number of particles or surface chemistry – then elongated particles of varying size and aspect ratios can be harmful. As important, if surface area is the key determinant, whether a particle arrived at its shape by cleavage or some other mechanism is irrelevant.

A report prepared for the Minnesota Department of Natural Resources and cited in the SDEIS provides support for the notion that short fibers can play an important role in creating disease. Environmental Resources Management, *Amphibole Mineral Fiber Toxicological Literature Review* 11-12 (March 2009) (ERM2009) [hereinafter MDNR Literature Review]. Citing three studies, the MDNR Literature Review states, “[o]ther studies that examined human tissues have found that the majority of asbestos fibers in mesothelial tissues were shorter than 5 µm in length, thus indicating the ability of shorter fibers to reach the tumor site, remain there, and as a consequence thereby implicating their role in the development of disease.” *Id.* (citations omitted). The MDNR Literature Review also discusses a series of studies that found short fibers contributed to health effects. *Id.* at 11.

The PolyMet Fibers Report also cites old preliminary research from 2003 regarding an absence of health effects experienced by Minnesota taconite workers to suggest that no health harms should result from mining the Duluth Complex. PolyMet 2007m at 61. This science is outdated; as presented above, more recent data show elevated mesothelioma, lung cancer and heart disease and overall death rates for taconite workers. In fact, the health effects experienced by those workers rings an alarm bell for the prospect of mining in the Duluth Complex.

The PolyMet Fibers Report also asserts that the low levels of fibers Barr

Engineering found in samples taken from the Duluth Complex suggest no health harm is likely. Barr 2007m at 65. In fact, even very low levels of mineral fibers can cause substantial health effects.

This question came up during the House Hearing referenced above. The proposed legislation would have banned asbestos with more than one percent of asbestos by weight. An amendment considered by the committee would have dropped the acceptable level to 0.25 percent asbestos. Dr. Aubrey Miller, then an EPA Senior Medical Officer and Toxicologist, was asked if the 0.25 level would have been protective of public health. Dr. Miller replied,

continued disturbance of products, even at that low-level of contamination will generate airborne exposures that can be very, very hazardous.

...

[I]f you have materials that may have 0.25 percent levels of asbestos contamination or lower, if you disturb them, we can easily measure the exposures in the air, and clearly, we know these exposures are associated with disease and readily present an opportunity for exposure, not only to workers, but to others across America.

House Hearing (Ex. 70) at 50. In a response to a supplemental question seeking substantiation for this position, Dr. Miller discussed a series of studies and provided a lengthy list of references. *Id.* at 272-75.

Similar testimony was provided by Dr. Christopher Weis, then an EPA Senior Toxicologist. Dr. Weis testified that, “there are a number of studies, in fact, by our Government, by the Canadian Government, by private individuals and industry scientists that indicate concentrations far below 1 percent, as low as 0.001 of a percent can generate airborne concentrations of concern for exposure.” *Id.* at 48. Dr. Weis also supplied supplemental material summarizing the studies he referred to as well as providing additional references. *Id.* at 208-09, 211.

3. The SDEIS Uses Flawed Assumptions About Control Measures

The SDEIS asserts that, “[t]he vast majority of potential emissions of MN-fibers for the NorthMet Project Proposed Action would occur from the ore crushing operations at the Plant Site, with minor potential emissions from the Tailings Basin and the Mine Site.” SDEIS 5-441. The authority cited for this proposition is Barr Engineering, *Emission Control Technology Review for NorthMet Project Mine Site* (September 2007) (Barr2007o) [hereinafter Emission Control Report]. In fact, the Emission Control Report contains no such information.

Instead, the report discusses various types of control measures. However, for many of the emission sources no mechanical control is proposed. For example,

Attachment B to the Emission Control Report, titled “NorthMet Mine Site Fugitive Emission Control Plan,” discusses a variety of dust-causing activities that would occur at the mine site and explains that no emission control is possible. These activities include: drilling and blasting; loading and unloading material; and dust from stockpiles. Another potential source of substantial dust emissions would be unpaved roads. The Emission Control Report notes that, “[p]aved roads cannot be used in mine areas due to the excessive weight of the haul trucks. *Id.* at 16. Attachment B suggests that water and/or dust suppressants will be applied to keep dust down. However, mines are notorious for failing to carry out such measures. As Mr. Ring points out, historically the Minnesota taconite mines have been a source of ambient dust. Ex. 52 at 6.

Thus, there is no basis in the record to believe mine workers won’t be exposed to dust at the mine site, if the mine becomes active.

4. The SDEIS Fibers Analysis Lacks Credibility

It is very troubling that PolyMet used the R.J Lee Group to analyze its samples for asbestos, and that the Co-Lead Agencies accepted this analysis for the SDEIS. This consulting firm consistently represents industry and, as noted above, EPA has demonstrated at Libby and El Dorado Hills how the firm uses inappropriate measures to analyze for asbestos. Further, the similarity between arguments found in the PolyMet Fibers Report and arguments used by the R.J. Lee Group – and rejected by EPA – at other mines undermines the credibility of the entire SDEIS fibers analysis.

The unusual preparation of the PolyMet flotation samples also raises credibility concerns. PolyMet’s contractor ground the samples destined for the electron microscope with a mortar and pestle to an unspecified degree – something that neither of the cited test methods calls for. Ex. 52 at 13-14. As Mr. Ring points out, this extra grinding prevents the results from being compared with Stevenson’s similar analysis. *Id.* Did the grinding remove fibers that PolyMet otherwise would have found? Was that the goal of the exercise? When important public health matters are involved, decision makers should be able to rely on information untainted by such concerns.

The State of Minnesota and the United States government are being asked to play dice with the future health of Minnesotans. Taconite mining in Minnesota has killed workers and others even though expert geologists say they can’t find asbestos in mine pits where the taconite comes from. Miners and ordinary citizens (family members of miners have been hit hard) have died in large numbers at Libby Montana even though the company’s experts claim the fibers there are not true asbestos.

PolyMet is now making the same arguments. It says the amount of true asbestos that can be found in the Duluth Complex is miniscule. It says only harmless cleavage fragments are involved. It is chilling that the same experts that defended W.R.Grace at Libby, Montana have been involved in preparing PolyMet’s fibers analysis. Worse, PolyMet repeats some of the false claims these consultants have made at other sites – even though EPA has shown the claims to be incorrect.

The facts are troubling. The deposit PolyMet seeks to mine contains the same kind of amphibole mineral that EPA scientist Dr. Philip Cook found to be very toxic (material from the Peter Mitchell Pit in the adjacent Biwabik Formation). Dr. Stevenson found asbestos in the Duluth Complex and amphiboles that created small, dangerous fibers when ground in the way PolyMet intends to do. A PolyMet contractor found an asbestos fiber after examining a very limited amount of PolyMet ore. Strong research concludes that elongated fibers of all sizes cause health effects and the key determinant is total surface area (especially when the aspect ratio is 3:1 or greater) – whether the fibers are created by cleavage or another process.

Why should Minnesota workers and their families as well as residents and visitors to the Arrowhead Region be put at risk? Why should PolyMet be allowed to drill and blast into a deposit that contains such material? It is time that the State of Minnesota and the United States government learn the lessons from the taconite mines and the disaster at Libby, Montana. This is a risk we should not take.

R. The SDEIS Should Include a Discussion of Impacts on Worker Health

The discussion of fibers above indicates the need for an assessment of the potential impacts of the Proposed Project on the health of people who would work there. Leaving the protection of workers to OSHA regulation without providing them and the public with an explanation of the risks is a disservice to the entire community.

In addition to fibers, it is apparent from the assessment of impacts on ambient air that working at the mine would pose health risks to workers. However, the assessment does not provide any information on air quality within the property line, so it is impossible to judge what the level of those impacts would be. The SDEIS should provide information about the ambient levels of pollutants for workers at various places within the Mine and Plant Sites, along with information about the health impacts of pollutants at those levels. A review of the health effects of particulate matter from the Journal of Toxicology is included as Exhibit 51.

S. The Economic Impacts Analysis Overstates Economic Benefits and Does Not Adequately Assess Economic Detriments.

All three of the Co-Lead agencies will make decisions regarding the Proposed Project based on a balance of the benefits of the project weighed against the detriments. The Army Corps of Engineers must undertake a “public interest review” of the Section 404 Wetlands Fill permit application; that review explicitly involves weighing the “benefits which reasonably may be expected to accrue from the proposal . . . against its reasonably foreseeable detriments.” 33 C.F.R. § 320.4(a)(1). The proposed land exchange is governed in part by the Federal Land Management Act, which allows land exchanges if certain requirements are met, including that the public interest is “well-served” by the exchange. This review includes consideration of both interests that are served by Forest

Service lands (recreation, fish and wildlife, etc.) and economic interests. 43 U.S.C. § 1716(a).

Under state law, the DNR may not grant a permit if permitted activities are

likely to cause pollution, impairment, or destruction of the air, water, land or other natural resources located within the state, so long as there is a feasible and prudent alternative consistent with the reasonable requirements of the public health, safety, and welfare and the state's paramount concern for the protection of its air, water, land and other natural resources from pollution, impairment, or destruction. Economic considerations alone shall not justify such conduct.

Minn. Stat. § 116D.04(6). The Minnesota Supreme Court interprets this somewhat opaque language as requiring a balancing test, “where the utility of . . . conduct which interferes with and invades natural resources is weighed against the gravity of harm resulting from such an interference or invasion.” *Minnesota Public Interest Research Group v. White Bear Rod and Gun Club*, 257 N.W.2d 762 (Minn. 1977).

Thus even if all other legal requirements are met, the three Co-Lead Agencies must still consider whether harm to the environment outweighs the benefits of the project. Because economic benefits are usually a primary consideration in this balance, it is very important that those benefits are not overstated or misunderstood. In this case, the SDEIS inflates the economic benefits, while downplaying the economic harm.

1. Economic Impacts Analysis Overstates the Economic Benefits of the Proposed Project

The numbers drawn from the Economic Impacts Assessment (EIA) do not take account of known limitations of the IMPLAN model, thus inflating the likely economic effects. Some of these limitations are noted in the EIA report itself. BBER 2012 at 3-4. In addition, we are submitting a review of an industry-wide report that was written by the same team at the Labovitz School of Economics. Hjerpe, Evan, and Spencer Phillips, “A Review of ‘The economic impact of ferrous and non-ferrous mining on the State of Minnesota and the Arrowhead Region,’” (Dec. 30, 2013) (Ex. 75). CVs for the authors are included as Exhibits 76 and 77. The 2009 version of the report that Hjerpe and Phillips review is included in the SDEIS reference materials as BBER 2009. The Hjerpe and Phillips review is not a review of the EIA for NorthMet; rather, it is submitted because it discusses limitations of the IMPLAN model and the model’s tendency to overstate economic effects.

Despite the caveats included in the EIA, numbers from the report are stated in the SDEIS as if they are neither uncertain, nor inflated. For example, the SDEIS states, “During typical year operations, the NorthMet Project Proposed Action would generate nearly 1,000 total direct, indirect, and induced jobs.” SDEIS 5-501. This failure to note the limitations of the EIA is especially pronounced in the Executive Summary, see SDEIS ES-40, which is unfortunately all that many will read.

In particular, the addition of induced employment, output, and value added to the numbers is misleading. Without a discussion of other forms of economic development that might be expected if the mine were not to be build, the entire practice of adding induced effects will virtually always make the impacts appear greater than they actually will be. As Hjerpe and Phillips point out, “regional economies are dynamic, but gravitate towards equilibrium in terms of economic indicators. That is, losses in one sector of the economy are generally offset by gains in other sectors; and gains in one sector are generally offset by losses in others, despite the tendency for regional economies to attain overall growth or restriction in the long run.” Ex. 75. To put it another way, if these jobs were not induced by the NorthMet project, at least some portion of them would be induced by other economic activity. The counting of induced effects assumes that if the NorthMet project did not happen, the local residents who would work there would either leave the area or remain unemployed. While this might be true for some, it is certainly not true for all. Even if the “Proposed Action could reduce unemployment in the study area by nearly one percent,” SDEIS 5-501, it is highly unlikely that the unemployment rate would actually be one percent higher without the mine than it would be if the mine were operating.

The EIA Report makes the same point:

Also, when considering the indirect and induced impacts, BBER suggests readers bear in mind that although impact analysis estimates the indirect and induced impacts of a direct change, these estimates are based on the assumption that nothing else happens within the local economy to help offset these impacts. "All other things being equal" is a common assumption in economics.

BBER 2012. This point has been lost in the SDEIS.

Furthermore, economic researchers and theorists note that dependence on resource extraction can inhibit other economic development. “Natural resources may crowd-out entrepreneurial activity and innovation by encouraging potential innovators to work in the resource sector (through a wage premium) and it thus directs funds away from the R&D sector into the primary sector.” Papyrakis, Elissaios, and Reyer Gerlagh “Resource abundance and economic growth in the United States,” *Economic Review* 51:1011-1039 (2007), Ex. 78. The failure of the SDEIS to recognize that other economic development is more likely to occur if the NorthMet project does not proceed makes the project appear to be more important than it actually is to the local economy.

The SDEIS also does not provide adequate information regarding the numbers that it presents. The SDEIS states:

The IMPLAN model includes assumptions about the portion of employment, value added, and output that accrues to the study area (in the case of the IMPLAN model, this is limited to St. Louis County), as opposed to the amount that “leaks” to locations outside of St. Louis County.

SDEIS 5-499. The SDEIS needs to provide specifics about these assumptions. For example, “profits” are included in the definition of “value added.” The analysis does not tell us if this includes PolyMet shareholder profits. If it does, almost all of these profits will be leaving St. Louis County. It would be very helpful to all parties, whether they support this project or oppose it, to be able to compare the economic benefits that would remain in the county to those that would not. Similarly, “output” is defined to include “minerals and processed mineral products,” virtually all of which would leave the county.

The discussion of taxes should include a point of comparison, such as total Minnesota tax revenues for 2011. *See* SDEIS 5-503. It should also include information on the percentage of taxes paid by mining companies that go back to the mining industry, and the degree to which the project is supported by public services. With no assessment of the cost of this facility to the state in terms of such things as regulatory oversight, emergency services, state-funded research, public education about the dangers of eating fish, and cost savings stemming from the LTV bankruptcy, the tax amounts do not indicate the actual benefit to the public of the Proposed Project.

Finally, the way in which these numbers are presented can strongly influence the impression they make. For example, estimated taxes for the project according to the EIA are \$69 million annually, and according to PolyMet are \$37 to \$80 million annually. SDEIS 5-503. In the initial summary, this becomes, “Federal, state, and local taxes would total up to an estimated \$80 million annually,” SDEIS 5-493. The Executive Summary takes it one step further: “Federal, state and local taxes would total estimated \$80 million annually.” The length of the SDEIS ensures that virtually no one will read beyond the Executive Summary or the initial material at the beginning of each section, and very few people will learn that taxes may be half of what is stated in the summaries. The SDEIS needs to do a better job of presenting an unbiased view of the project.

2. The Economic Impacts Assessment Downplays or Ignores Negative Impacts

Mirroring the way in which environmental impacts are presented, the economic assessment emphasizes positive effects and downplays negative ones. For example, the additional jobs are presented as a clear benefit, “reduc[ing] unemployment in the study area by nearly one percent,” SDEIS 5-501. However, after closure, those jobs “account for less than one percent of the overall study area workforce . . . [and a]ny increase in study area unemployment during and after closure . . . would be minimal.” Similarly, unemployment during a “bust” could be offset by “the diverse economy of the study area.” SDEIS 5-496. A change in industrial productivity is not seen as a situation in which more local resources will be extracted with less local benefit, or as contributing to the ongoing decline in mining employment, but as “lessen[ing] the effect of booms and busts in mining communities.” SDEIS 5-497.

The SDEIS notes that there may be economic costs of environmental degradation, but then conflates that factor with non-market values, which is an entirely different issue.

We agree that a monetary value cannot be placed on clean water, clean air, and the continued presence of moose and wild rice in the state of Minnesota. However, these values are *in addition to* monetary costs of environmental degradation, such as the health care and lost productivity costs of air pollution, the cost of replacing subsistence fishing and hunting with other sources of protein, and the lost value of wild rice. While we recognize that NEPA regulations do not require a quantitative cost/benefit analysis, if economic benefits are quantified as they have been here, economic costs should also be quantified. Not providing comparable quantitative information on costs results in an inevitable bias and inflates the value of the project.

The SDEIS points out that “Mine workers in the Arrowhead region and beyond ‘are willing to commute considerable distance . . . to well-paid jobs . . . to protect investment in their homes.’” SDEIS 5-498, quoting Powers 2007. It goes on to suggest that workers will commute as far as 80 miles to work on construction. This is not a positive statement; in fact, it is one more reason why the permitting of the project would not be good public policy. Encouraging employment that has people driving this far (and emitting the corresponding amount of greenhouse gases and other pollutants) is exactly the opposite of what we need to be doing as a matter of public policy. State, federal, and local agencies should all be promoting employment situations that *eliminate* commuting, rather than promoting it as good for the economy.

The SDEIS recognizes the boom and bust nature of the mining industry, and the possibility that jobs may come and go. SDEIS 5-501. It is unclear what is meant by the statement that “To account for some of these concerns, commodity prices in the IMPLAN model are generally conservative, compared to price trends.” The IMPLAN model explicitly does not address production slowdowns or shutdowns. If it did, the appropriate comparison would not be to average prices, but to recent low prices, because slowdowns or shutdowns would come when prices fall below the average. The average price has not impact on slowdowns and shutdowns; if it did, this would not be a cyclical industry. The low prices for all of the metals are lower than the modeled price. SDEIS 5-496.

When reviewed without bias, the information provided seems to indicate that if prices dip as low as they have in the past, there will likely be slowdowns or shutdowns. As with so many statements in the SDEIS, the statement that the commodity prices used in modeling account for concerns about suspension of mining operations seems to have no relevance other than to minimize the potential negative impacts in the mind of the reader.

The attitude in the SDEIS toward mine closure is truly remarkable. We have to guess that whoever wrote this section has never lived in a mining community when the mine shut down. The level of enthusiasm for this project in Hoyt Lakes is due in part to the difficulties the community has had since LTV closed. The cavalier assumption that people would simply move away when the mine closes defies belief, especially in light of the rosy picture painted of employing local people who are currently unemployed. The NorthMet mine would simply set the community up for another round of instability,

kicking the need to build a sustainable economy down the road to the next generation along with the permanently polluted mine site.

The reality is that economies built on mining are not stable, and returning to the mining teat now will not help Hoyt Lakes or Babbitt in the long run. Table 4.2.10-9 reveals that the entire Iron Range and every community in St. Louis County has a higher unemployment rate than either Lake or Cook Counties, which have no mines. While incomes are not as high in some non-mining communities, it is the lack of stability in employment that creates the larger problem.

On a global scale, the tendency of natural resource (particularly oil or mineral) rich countries to experience poor economic growth is well-known and studied. This tendency is known as the “resource curse.” Although most studies have focused on resource-rich nations, a few studies indicate that the tendency also holds true for states and counties within the United States. Researchers at the University of Wyoming School of Economics and Finance reviewed 3,092 counties (most of the counties in the United States) and found:

strong evidence that the curse of natural resources holds at the county level. The coefficient on natural resource earnings is consistently negative and statistically significant. A main advantage of looking for the resource curse at the county level is a reduced need to control for confounding effects such as differences in institutions, spoken language, currencies and government corruption. However, we do control for possible county-level effects such as state specific fixed factors, demographic variation in age, race and education, population density, initial income, and spatial correlation. Furthermore, to analyze the stability of the resource curse over time, we consider five separate sample periods starting in the base year of 1980 (first year of consistently available data from the Census Bureau) and ending in the years 1985, 1990, 1995, 2000 and 2005. The curse is always statistically significant and remarkably robust to changes in the sample period, control variables and estimation techniques.

James, Alex, and David Aadland, “The Curse of Natural Resources: An Empirical Investigation of U.S. Counties,” 33 *Resource and Energy Economics* 2:440-453(2011), Ex. 79. One specific finding was that “from 1980 to 1995 incomes in the most resource-dependent counties shrank at a -0.4% rate while income in the 195 least resource-dependent counties grew at 1.6%.” *Id.*

Other researchers found a similar negative correlation between resource abundance and economic growth when studying 49 of the 50 states. They found that “A one-percentage point increase in income from the primary sector’s production relative to total income decreases growth by 0.047% per year. An increase in income from natural resources of one standard deviation (0.06) decreases the growth rate by about 0.28% per year. This is an effect of substantial magnitude.” Papyrakis, *et al.*, Ex. 78. They conclude, “The numbers illustrate the argument that whereas in the short-term natural resources may increase wealth, in the long term the economy can fall back more than it gained.” *Id.*

In summary, the short-term increase in jobs and tax revenues promised by the Proposed Project does not necessarily mean that the net economic impact of the project would be positive. Focusing on quantified financial predictions downplays the substantial reasons why pursuing the expansion of mining in Northeastern Minnesota would be poor public policy in terms of economics as well as the environment.

3. Increasing Metal Production is Poor Public Policy

The stated purpose of the Proposed Project includes helping to “meet domestic and global demand by sale of these products to domestic and world markets.” The Co-Lead agencies need to step back and consider whether these metals are actually needed, and whether increasing the supply of metals is actually in the public interest. The assumption that meeting consumer demand is positive and necessary, and that environmental degradation is a by-product that we have to live with, is threatening the viability of the planet.

In the capitalist economy that we live under, the primary inhibitor of consumption is cost. We have very few means to rein in the over-use of resources that has resulted in the looming and enormous threat to the well-being of humans and other life on Earth. The most positive public policy step that could be taken in this instance is to allow the price of copper and other metals to rise so that they would be recycled more and used less profligately. *We do not need to mine in places where important water resources could become contaminated. We do not need to create hazardous waste sites that will remain contaminated for hundreds or thousands of years. Our economic well-being does not require this.*

II. The SDEIS Analysis of Alternatives is Inadequate

The alternatives analysis in the SDEIS violates NEPA and MEPA by (1) defining the purpose and need too narrowly in order to eliminate consideration of other reasonable alternatives; (2) failing to accurately describe the no action alternative; and (3) failing to include the consideration and comparison of reasonable alternatives, including the underground mine alternative and the west pit backfill alternative. The alternative analysis also violates the Clean Water Act by failing to clearly demonstrate that the proposed action is the least environmentally damaging practicable alternative.

“An EIS must discuss alternatives to the proposed action.” *Friends of the Boundary Waters Wilderness v. Dombeck*, 164 F.3d 1115, 1128 (8th Cir. 1999), citing 42 U.S.C. § 4332(2)(C)(iii). “NEPA requires federal agencies to ‘study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.’” *Id.*, quoting 42 U.S.C. § 4332(2)(E). MEPA similarly requires that an EIS “compare the potentially significant impacts of the proposal with those of other reasonable alternatives to the proposed project.” Minn. R. 4410.2300(G).

The alternatives section is considered “the heart” of an EIS. 40 C.F.R. § 1502.14; *see also Simmons v. U.S. Army Corps of Engineers*, 120 F.3d 664 (7th Cir. 1997) (stating that when preparing an EIS, an agency must consider all reasonable alternatives in depth, and that “[n]o decision is more important than delimiting what these ‘reasonable alternatives’ are”). The analysis of alternatives in an EIS “should 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 decisionmaker and the public.” 40 C.F.R. § 1502.14.

Additionally, the Clean Water Act prohibits the discharge of dredge and fill material “if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem.” 40 C.F.R. § 230.10(a). Where a proposed action is not “water dependent,” practicable alternatives that avoid special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. *Id.*

The alternatives analysis in the SDEIS is inadequate and fails to comply with the requirements for alternatives under NEPA, MEPA, and Section 404 of the Clean Water Act.

A. *The SDEIS Defines an Impermissibly Narrow Purpose and Need*

An agency may not define a project’s purpose “so unreasonably narrow” as to make the EIS “a foreordained formality.” *City of Bridgeton v. Slater*, 212 F.3d 448, 458 (8th Cir. 2000). As explained by the Seventh Circuit:

One obvious way for an agency to slip past the strictures of NEPA is to contrive a purpose so slender as to define competing “reasonable alternatives” out of consideration (and even out of existence). The federal courts cannot condone an agency’s frustration of Congressional will. If the agency constricts the definition of the project’s purpose and thereby excludes what truly are reasonable alternatives, the EIS cannot fulfill its role. Nor can the agency satisfy the Act.

Simmons v. U.S. Army Corps of Eng’rs, 120 F.3d 664, 666 (7th Cir. 1997); *see also Fuel Safe Washington v. Fed. Energy Regulatory Comm’n*, 389 F.3d 1313, 1324 (10th Cir. 2004) (agency may not define a project so narrowly that it forecloses a reasonable consideration of alternatives).

The applicant’s stated purpose for the proposed project “is to exercise PolyMet’s mineral lease to continuously mine, via open pit methods, the known ore deposits (NorthMet Deposit) containing copper, nickel, cobalt, and PGEs to produce base and precious metal precipitates and flotation concentrates by uninterrupted utilization of the former LTVSMC processing plant.” SDEIS 1-11. The Corps and DNR similarly define the purpose of the project as “to produce base and precious metals precipitates and

flotation concentrates from ore mined at the NorthMet Deposit by uninterrupted operation of the former LTVSMC processing plant.” SDEIS 1-12.⁹

The Corps and DNR cannot simply adopt the applicant’s stated purpose for a proposed action. Rather, “[t]he Corps has ‘the duty under NEPA to exercise a degree of skepticism in dealing with self-serving statements from a prime beneficiary of the project.’” *Simmons*, 120 F.3d at 669, *quoting Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 209 (D.C. Cir. 1991) (Buckley, J., dissenting); *see also* 33 C.F.R. Pt. 325, App. B, §§ (9)(b)(4),(5) (stating that the Corps must “exercise independent judgment in defining the purpose and need for the project,” and that the Corps “is neither an opponent nor a proponent of the applicant’s proposal”). As in *Simmons*, the Corps here has failed to exercise its independent judgment “in its wholesale acceptance of [PolyMet’s] definition of purpose.” *Simmons*, 120 F.3d at 669. In doing so, the Corps and DNR have also failed to comply with their NEPA and MEPA obligations in accepting PolyMet’s claim that there are *no* reasonable alternatives to PolyMet’s proposed open-pit mine plan.

B. The SDEIS Fails to Accurately Set Forth the No Action Alternative

NEPA and MEPA require that every EIS must include a “no action” alternative. 40 C.F.R. 1502.14(d); Minn. R. 4410.2300(G). The alternatives analysis requires full examination of a “no-build” alternative and examination of a spectrum of “real” options, not just those tailored to the desires of the project proposer. *See Fuel Safe Washington*, 389 F.3d at 1324 (10th Cir. 2004); *Custer County Action Association v. Garvey*, 256 F.3d 1024, 1040 (10th Cir. 1002); *Muckleshoot Indian Tribe*, 177 F.3d at 812-13. The SDEIS includes a “no action” alternative, but its description and analysis of the no action alternative fails to meet NEPA and MEPA requirements.

Pursuant to NEPA guidance provided by the Council on Environmental Quality, where the choice of “no action” for a proposed project would result in predictable actions by others, this consequence of the “no action” alternative should be included in the EIS. 46 Fed. Reg. 18026 (March 23, 1981). For PolyMet, the SDEIS briefly discloses that under the no action alternative, Cliffs Erie would be required to complete closure and reclamation activities as specified under state permits and the Cliffs Erie Consent Decree. SDEIS 3-142. However, the SDEIS fails to provide a description of the environmental outcomes once Cliffs Erie comes into full compliance with the Clean Water Act and state water quality standards.

⁹ The “need” for the project is described by the applicant as the domestic and global demand for these metals, as well as the need for jobs and economic development in the area. SDEIS 1-11. The Corps and DNR limit the need for the project to helping meet domestic and global demands by sale of these products to domestic and world markets. SDEIS 1-12. As discussed elsewhere in these comments, this conflates “need” with “demand;” nothing in the record indicates a global shortage of these metals for important purposes, particularly not one that the small amount of many of the metals proposed to be mined here would affect in any way.

Much of PolyMet's public messaging around this proposal is that the company will be redeveloping an existing "brownfield" site, and improving current conditions. While it is correct that there is ongoing pollution at the LTV site, and that Cliffs Erie has repeatedly violated the Clean Water Act through unlawful discharges of pollutants at this site, the SDEIS must make clear that under the no action alternative the site must be brought into compliance with the Clean Water Act. The clean-up and cessation of pollution at the LTV site, in compliance with the Clean Water Act, is not optional and must occur under the Cliffs Erie Consent Decree, or some other mechanism if the consent decree proves ineffective. Thus all modeling under the no action alternative, and all comparisons of the proposed alternative to the no action alternative, must be premised on full compliance of Cliffs Erie discharges with the Clean Water Act.

Although the SDEIS does state that the "continuation of existing conditions" scenario used in modeling is not the same as the "no action" alternative, the no action alternative was not modeled, so the "continuation of existing conditions" is the only thing available with which to compare predicted impacts of the proposed alternative. This cannot help but confuse readers, and in any event does not comply with NEPA and MEPA requirements.

C. *The SDEIS Fails to Include Other Reasonable Alternatives*

Agencies must "rigorously explore and objectively evaluate all reasonable alternatives." 40 C.F.R. § 1502.14(a); *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 812-13 (9th Cir. 1999); *see also* Minn. R. § 4410.2300(G). For PolyMet's NorthMet proposal, the agencies fail to include in the SDEIS any alternatives other than the mandatory no action alternative, in violation of NEPA and MEPA. Moreover, for two alternatives that it chose not to consider – an underground mine and the west pit backfill alternatives – the agencies fail to provide an adequate explanation, again in violation of NEPA and MEPA.

1. *The Underground Mine Alternative*

The agencies acknowledge that when compared to the proposed open-pit mine alternative, an underground mine alternative at this site would offer significant environmental benefits, including fewer effects on wetlands, less water to be managed, less waste rock to be managed, and reduced air emissions. Indeed, the 900 acres of wetlands destruction under the open-pit mine alternative would be mostly eliminated, and the amount of tailings and waste rock generated by the project would be significantly reduced. The SDEIS also fails to acknowledge that under an underground mine alternative, a land exchange with Forest Service would no longer be needed to allow for a strip mine, and that therefore environmental sensitive areas such as the 100 Mile Swamp and lynx critical habitat, along with tribal historical and cultural resources, would remain in federal control. Moreover, because water quality and water quantity impacts would be reduced under the underground mine alternative, perpetual mechanical

water treatment might not be necessary to meet water quality standards, as it would be for the open-pit mine alternative.

The agencies further acknowledge that an underground mine is technically feasible at this site. Thus, the only reason provided for not including full consideration of an underground mine as a reasonable alternative within the SDEIS is economic feasibility. However, the agencies acknowledge that because of a lack of information provided by PolyMet, it is not possible to undertake a quantitative, side-by-side assessment of the financial feasibility of an underground mine as compared to the proposed open-pit mine. The agencies instead performed a “screening-level review” of the feasibility of an underground mine at the NorthMet Deposit. SDEIS, Appendix B 2.

The SDEIS does not sufficiently disclose what information was considered in determining that an underground mine at this site would not be economically feasible. The assessment does not disclose what costs were included, or how the timing of those costs affected the analysis. It is completely unclear whether factors such as the cost of the land exchange, the potential for a much shorter term of required mechanical water treatment, the decreased costs for wetlands mitigation, and the decreased costs of other mitigation measures associated with an open-pit mine were included. PolyMet has every incentive in this exercise to estimate costs of an underground mine at the high end, and to eliminate costs of a surface mine from the equation.

From the information that is provided, it appears that a main difference between an open-pit mine and an underground mine at this location is that there would be major additional expenses up-front for an underground mine, which impacts PolyMet’s assessment of profits, returns on investment, and economic feasibility. In contrast, much of the expense for an open-pit mine would not be encountered until post-closure, but would continue for many hundreds of years, when PolyMet will no longer exist as a company. While PolyMet may not want to take this into consideration, the agencies must in setting forth alternatives under NEPA and MEPA.

What the SDEIS fails to provide but is needed for informed public comment and decisionmaking is a meaningful and understandable side-by-side comparison of the anticipated expenses and profits of an underground mine compared to an open-pit mine. This comparison must address and disclose all relevant factors, including the need for a land exchange, wetland mitigation, and long-term water treatment, maintenance, mitigation and monitoring. Without such an objective comparison, the conclusion in the SDEIS that an underground mine at this site would be economically infeasible is arbitrary and inadequate.

Furthermore, it is unclear why the alternative was eliminated for assessment based on current economics. If the purpose and need for the project was properly stated, an important option to consider would be to wait to mine this ore deposit until an underground mine becomes economically viable. An important factor in deciding whether that option is the most prudent one available would be the degree to which environmental impacts would be lessened. Because the alternative was not included in

the assessment, we do not have that information. The agencies have impermissibly acquiesced to the mining company's business decisions and desires, i.e., to mine the ore body now rather than continuing to hold it. Requiring the company to wait until underground mining is viable is not an onerous burden that the agencies would be placing on the company; it is in fact an existing limitation on their rights pursuant to their deed, as explained below. Furthermore, it is the type of decision that mining companies make on a routine basis. Eliminating this option based on the desires of the mining company violates the NEPA requirement that the agencies assess all reasonable alternatives.

2. The West Pit Backfill Alternative

The SDEIS fails to provide sufficient explanation for not including the alternative of utilizing the West Pit for disposal of mining and processing waste. The option to backfill the West Pit with waste rock that would otherwise be permanently stored in the Category 1 Stockpile was raised by the Tribes as an alternative that would minimize impacts to wetlands, surface water and groundwater. This alternative was rejected by the agencies and not considered as an action alternative in the SDEIS. SDEIS 3-151.

One primary reason provided by the agencies as to why the West Pit Backfill alternative was not considered is "additional mineral resources in the West Pit . . . would be effectively lost if the pit was used for waste rock and/or tailings disposal." SDEIS 3-151. If PolyMet intends to mine additional minerals from the West Pit, this must be analyzed now in the SDEIS for this mine proposal. Clearly additional mining in the same pit would be characterized under NEPA as connected, cumulative, and similar actions, all of which must be analyzed together in a single EIS. 40 C.F.R. § 1508.25. Similarly, if additional mining in the West Pit is foreseeable enough to preclude consideration of a reasonable alternative that would reduce environmental impacts, it is also reasonably foreseeable for the purpose of assessing the potential impacts of the current proposed action. See 40 C.F.R. § 1508.7 (defining "cumulative impacts" to include "reasonably foreseeable future actions"); 40 C.F.R. § 1508.8(b) (defining "indirect effects" to include effects that are later in time "but are still reasonably foreseeable").

The regulatory agencies obligation under NEPA is to analyze all reasonable alternatives, especially those such as the West Pit Backfill alternative that would minimize environmental impacts. By contrast, the agencies are certainly not obligated to provide future hypothetical opportunities for the project proponent down the road, if the proposed action is implemented. While accessing additional minerals through the West Pit could provide future profits to PolyMet or some other entity, this is clearly not a legitimate reason to reject consideration of this reasonable alternative in the SDEIS.

Another explanation for rejecting this alternative is that the West Pit would not be available for backfilling until the end of mining, and the Category 1 Stockpile would therefore still be required for the 20 year life of the proposed mine. SDEIS 3-151. This

ignores the environmental mitigation that would be provided for the many hundreds of years following closure of the mine, when pollution from the Category 1 Stockpile is anticipated to continue. Indeed, the SDEIS acknowledges that the backfilling of the Category 1 Stockpile into the West Pit following closure of the mine would allow for reclamation of the affected surface footprint, including the potential to recreate wetlands areas and restore function. *Id.* Moreover, removal of the Category 1 Stockpile “would improve visual aesthetics.” SDEIS 3-152.

Based on the cursory assessment of this potential alternative provided by the agencies, it is apparent that the West Pit Backfill alternative meets the purpose and need for the proposed action, is technically feasible, and is economically feasible. In light of the significant concerns that have been expressed for years by the Tribes, EPA, other agencies, and the environmental community regarding the inability of the proposed action to meet water quality standards, the devastating impacts of the proposed action on high quality wetlands, and the need for mechanical water treatment for hundreds of years, the regulatory agencies clearly should have included consideration of this alternative based on its potential to provide additional mitigation concerning impacts to wetlands, surface waters, and groundwater.

The SDEIS claims that there would be some additional environmental trade-offs in implementing a West Pit Backfill alternative. SDEIS 3-151 to 152. But that is the very type of comparison that a NEPA and MEPA alternatives analysis is required to provide to the public and decisionmaker. 40 C.F.R. § 1502.14; Minn. R. 4410.2300(G). The agencies rejected this alternative based on environmental impacts that have not been modeled or quantified, and thus cannot be compared with other alternatives. The summary rejection of this reasonable alternative leaves the SDEIS with only one “action alternative” and violates NEPA and MEPA. *Id.*

D. The SDEIS Fails to Clearly Demonstrate That There Are No Practicable Alternatives to the Proposed Action, as Required by the Clean Water Act

Section 1.01 The U.S. Army Corps of Engineers is one of the three regulatory agencies that prepared the SDEIS, primarily due to its authority under Section 404 of the Clean Water Act, which prohibits the dredging or filling of wetlands without first obtaining a Section 404 permit from the Corps. 33 U.S.C. § 1344. The Section 404(b) Guidelines prohibit the Corps from issuing a 404 permit “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.” 40 C.F.R. § 230.10(a); see also 33 C.F.R. § 320.4(a)(2)(ii). Four years ago, the EPA notified the Corps that the proposed action was not the least environmentally damaging practicable alternative, and that there are other alternatives that would have less adverse impacts to the aquatic environment. See Feb. 18, 2010 EPA letter, Ex. 1. The SDEIS still fails to demonstrate that there are no practicable alternatives to the proposed action that would result in less adverse impacts to wetlands and the aquatic ecosystem.

The Clean Water Act and its implementing regulations “express a strong preference for wetland protection.” *National Wildlife Federation v. Whistler*, 27 F.3d 1341, 1344 (8th Cir. 1994). “Thus, where ‘there is a *practicable alternative* . . . which would have less adverse impact on the aquatic ecosystem,’ the Corps cannot issue a dredge and fill permit.” *Id.*, quoting 40 C.F.R. § 230.10(a) (emphasis in original). A “practicable alternative” is one that is “available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.” 40 C.F.R. § 230.10(a)(2).

Importantly, “practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise,” if the activity for which the permit is sought “does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not ‘water dependent’).” 40 C.F.R. § 230.10(a)(3). “In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise.” *Id.* Thus, “[i]f the proposed activity is not water dependent, the permit applicant must rebut the presumption of environmentally preferable and practicable alternatives by clearly demonstrating the absence of such alternatives.” *Sierra Club v. Van Antwerp*, 709 F.Supp. 2d 1254, 1260 (S.D. Fla. 2009).

In *Bering Strait Citizens for Responsible Resource Development v. U.S. Army Corps of Engineers*, 524 F.3d 938, 947 (9th Cir. 2008), the parties agreed that a proposed gold mine project was not water dependent. Moreover, in *Sierra Club v. Van Antwerp*, 709 F.Supp. 2d at 1261, the court held that proposed limestone mining was also not water dependent. Similarly, proposed copper-nickel mining in the Duluth Complex of northeastern Minnesota is not water dependent, meaning that practicable and environmentally preferable alternatives are presumed to be available.

Because the proposed PolyMet copper mine is not a water-dependent project, the Corps must assume “that practicable alternatives exist unless the applicant ‘clearly demonstrates otherwise.’” *National Wildlife Fed’n*, 27 F.3d at 1344, quoting 40 C.F.R. § 230.10(a)(3); see also Minn. R. 7050.0186(4) (prudent and feasible alternatives that do not involve wetlands are presumed to be available unless clearly demonstrated otherwise by the permit applicant). “This presumption of practicable alternatives ‘is very strong.’” *National Wildlife Federation*, 27 F.3d at 1344, quoting *Buttrey v. United States*, 690 F.2d 1170, 1180 (5th Cir. 1982) (emphasis in original).

A discussion of the presumption of practicable alternatives, and an analysis as to whether the proposed action is the least environmentally damaging practicable alternative, is absent from the SDEIS. The SDEIS thus fails to demonstrate that there are no practicable alternatives to any of the wetland fills that are proposed for permitting, and fails to demonstrate the absence of other less environmentally damaging alternatives, as required by the Section 404(b) Guidelines and the Clean Water Act. 40 C.F.R. § 230.10(a); 33 C.F.R. § 320.4(a)(2)(ii); Minn. R. 7050.0186(4).

III. The Proposed Land Exchange Is Not Necessary and Does Not Serve the Public Interest

A. *The Forest Service Must Withdraw the Land Exchange Proposed Action Because There Is No Conflict That Needs To Be Resolved*

The SDEIS states that the purpose of the Land Exchange is to “consolidate the surface and mineral ownership of the lands involved at the Mine Site.” SDEIS 1-11. The SDEIS goes on to state:

PolyMet intends to exercise private mineral rights that were reserved when lands were conveyed to the United States and has proposed the development of a surface mine. This land was purchased by the USFS, for National Forest purposes, under the authority of the Weeks Act. The USFS has taken the position that the mineral rights that were reserved do not include the right to surface mine as proposed by PolyMet.

In addition, allowing private surface mining would be inconsistent with USFS legal mandates for acquiring and managing these lands. The USFS needs to resolve this fundamental conflict.

SDEIS 1-12.

At the outset, it is important to dispense with the notion that there is some “fundamental conflict” that must be resolved. No such conflict exists. If “the mineral rights that were reserved do not include the right to surface mine as proposed by PolyMet,” then there is no conflict with not allowing that kind of mining to occur. PolyMet is not entitled to engage in activities that its predecessors-in-interest failed to reserve at the time the United States acquired the surface. To put it more simply, PolyMet is seeking to exercise a property right that it does not possess.

Many courts have held that the right to surface mine, such as that proposed by PolyMet, must be expressly reserved in the applicable deed. For example, in *Belville Mining Co. v. United States*, 999 F.2d 989 (6th Cir. 1993), the court considered whether strip mining for coal had been reserved in various deeds when the United States acquired land pursuant to the Weeks Act for inclusion in the Wayne National Forest in Ohio. One of the deeds for a tract of land known as the Culbertson Tract contained the following regulatory language inserted by the Department of Agriculture:

In new development work and operations, all reasonable and usual precautions required by the general mining laws for the *support of the surface*, will be made and to this end *tunnels, shafts and other workings* will be subject to inspection by the Forest Officer in charge and by mine inspectors of the United States.

...

In prospecting for, and in mining or removing said coal, oil and gas and in manufacturing the products thereof, *only so much of the surface as is reasonably necessary for the purpose, shall be used.*

...

All mining operators shall in all future developments make reasonable provision for the disposal of tailings, dumpage and other deleterious material or substance in such a way as to prevent obstruction, pollution, or deterioration of lakes, ponds, or springs.

Belville Mining Co. v. United States, 999 F.2d 989, 994 (6th Cir. 1993) (emphasis added). The Sixth Circuit held:

These references to mine tailings, tunnels, shafts, and surface support, coupled with the prohibition against using more of the surface than is reasonably necessary, *leave no room for doubt* that the type of mining contemplated by the parties to the Culbertson deeds was deep [i.e. underground] mining.

Id. (emphasis added). The court added that:

[t]he right to mine and remove coal by deeds conveying land in language peculiarly applicable to underground mining does not include the right to remove such coal by strip mining methods.

Id. (quoting *Stewart v. Chernicky*, 439 Pa. 43, 52 (1970)).

PolyMet's deed contains provisions similar to those in the Culbertson deed in *Belville Mining*. For example, PolyMet's deed states that the mineral reservation is "subject to and in accordance with" seven regulations of the Secretary of Agriculture. Two of those regulations state:

2. In prospecting for, and in mining and removing minerals, oil and gas, and in manufacturing the products thereof, *only so much of the surface shall be occupied, used or disturbed as is necessary for the purposes.*

3. In underground operations all reasonable and usual precautions shall be made for the *support of the surface*, and to that end *tunnels, shafts, or other workings* shall be subject to inspection and examination by the Forest Officers, Mining Experts or Inspectors of the United States.

PolyMet Deed 2 (Ex. 80).

These regulations are similar to the ones considered in *Belville Mining* that were found “to leave no room for doubt” that the right to strip mine was *not* reserved in the deed. According to the Sixth Circuit:

The express requirement in the Culbertson deeds that precautions be taken “for the support of the surface” is inconsistent with the notion that the parties intended to permit strip mining. A right of subjacent support of the surface is clearly pointless if the parties contemplate that the surface will be removed. “[S]trip mining,” as the Skivolocki court observed, “necessarily and unavoidably causes total disruption of the surface estate.”

Belville Mining Co., 999 F.2d at 994 (quoting *Skivolocki v. East Ohio Gas Co.*, 38 Ohio St.2d 244, 248-49 (1974)).

The Sixth Circuit also looked at other versions of the Secretary of Agriculture’s rules and regulations to conclude that the version used in the Culbertson Tract conveyance did not reserve the right to strip mine:

Of some significance, in this connection is a compendium of Agriculture Department rules and regulations set out in the Culbertson deeds. The Department of Agriculture developed these regulations to govern the removal of minerals on lands acquired under the Weeks Act, and the regulations were required to be inserted in Weeks Act conveyances whenever mineral rights were reserved. *The particular edition of the regulations incorporated in the Culbertson deeds, unlike later editions incorporated in the deeds to the Bauer, Simmering and Jenkins tracts, contained no reference to strip mining. The Culbertson deed regulations did refer specifically to underground mining, however.* Like the main body of the Culbertson deeds, the attached regulations required that provision be made for support of the surface. To that end the regulations said that “the tunnels, shafts, and other workings shall at all reasonable times be open to inspection and examination....” The regulations also prohibited the pollution of lakes, ponds or springs by “tailings,” and called for special use permits for the construction of “structures such as mine shafts, tipples, derricks, pumphouses, hoppers, etc.....” It is hard to imagine language more peculiarly applicable to underground mining.

Id. at 994-95.

Just as the Sixth Circuit found it instructive to look at other versions of the Secretary of Agriculture’s rules and regulations, so should the Forest Service here. Other versions of the Secretary of Agriculture’s rules and regulations for insertion into deeds conveying land to the United States support the fact that PolyMet’s deed did not reserve the right to strip mine. For example, the rules and regulations published in 1937 state:

If the exercise of the rights herein reserved will result in the stripping, collapse, or other damage of the land or any improvements thereon, the recorded owners of the reserved rights, or his legally authorized representative, shall, upon written

notification by the Forest Supervisor, pay to the designated fiscal officer of the United States, for deposit in a cooperative fund, the amount determined by the Forest Officer in charge of the area to be necessary to restore the land to a serviceable or safe condition or to repair or replace the improvements damaged or destroyed; such cooperative deposits to be available for expenditure by the United States for the purposes for which deposited.

USDA-FS Rules and Regulations to Govern Exercise of Mineral Rights Reserved in Conveyances to the United States (1937) (Ex. 81).

The 1937 rules and regulations demonstrate that the Forest Service was aware of and intended to allow “stripping” in that version of the Secretary of Agriculture’s rules and regulations. The absence of similar language in PolyMet’s deed indicates that the parties to that deed did not intend for strip mining to occur on these acquired Federal lands.

The similarity between *Belville Mining* and this case are striking. Both cases concern national forest land acquired pursuant to the Weeks Act. Both cases involve deeds with similar language that reserved the mineral estate but did not reserve the right to strip mine. Rather than needlessly giving these lands to PolyMet so that it can destroy them through open pit surface mining, the Forest Service should follow the example that led to the *Belville Mining* case and protect these lands.

It is also worth noting that the Ohio Supreme Court subsequently viewed the Sixth Circuit’s decision in *Belville Mining* favorably. For example, in *Graham v. Drydock Coal Company*, the Ohio Supreme Court held that:

...a deed which severs a mineral estate from a surface estate, and which grants or reserves the right to use the surface incident to mining coal, in language peculiarly applicable to deep-mining techniques, whether drafted before or after the advent of strip mining, does not grant or reserve to the mineral owner the right to remove coal by strip-mining methods.

Graham v. Drydock Coal Co., 76 Ohio St.3d 311, 318 (1996).

In *Drydock Coal*, the coal company argued that even though the deed did not explicitly contain language allowing strip mining, that right should be implied since the deed was executed after strip mining had become more common. The Ohio Supreme Court rejected this interpretation:

We note also that our holding in this case is consistent with the rules adopted in the other coal-mining jurisdictions to have considered the question. *Drydock* points to *Belville Mining Co. v. United States* (C.A.6, 1993), 999 F.2d 989, a federal Sixth Circuit case construing Ohio law, for the proposition that deeds drafted after strip mining became widely known and used should be interpreted to include the right to strip-mine along with the mineral owner’s right to deep-mine

for coal. Appellee mischaracterizes the court's holding. In fact, the court held that the intent of the parties is controlling, and that when deep-mining language is used exclusively, courts must assume that strip mining was not intended. *Id.* at 993-994.

Id. at 317-18. The Ohio Supreme Court then explained that both *Belville Mining* and *Drydock Coal* were consistent with cases in other jurisdictions facing similar issues:

The courts of Pennsylvania, West Virginia, Virginia, Missouri, Colorado, and Texas have all adopted the rule we state today, using such language as: “[W]hen a grantor, as in this case, sells the surface of the land, he knows that the use of it for farming and other purposes is contemplated and assents thereto. [I]f he desires to reserve rights inconsistent with the full enjoyment of the surface, it is his duty to reserve those rights by clear and unequivocal language. It is hardly to be supposed that either the grantor or the grantee for a moment contemplated the reservation of a right which would enable the grantor to totally destroy the subject matter of the conveyance.” *Stonegap Colliery Co. v. Hamilton* (1916), 119 Va. 271, 292, 89 S.E. 305, 311. “[I]n view of the surface violence, destruction and disfigurement which inevitably attend strip or open mining, no land owner would lightly or casually grant strip mining rights, nor would any purchaser of land treat lightly any reservation of mining rights which would permit the grantor or his assignee to come upon his land and turn it into a battle-ground with strip mining’. Therefore, ‘the burden rests upon him who seeks to assert the right to destroy or injure the surface’ to show some positive indication that the parties to the deed agreed to authorize practices which may result in these consequences.” (Citations omitted.) *Stewart v. Chernicky*, 439 Pa. at 50, 266 A.2d at 263. See, also, *Phipps v. Leftwich* (1976), 216 Va. 706, 222 S.E.2d 536; *Groves v. Terrace Mining Co.* (Mo.1960), 340 S.W.2d 708; *Smith v. Moore* (1970), 172 Colo. 440, 474 P.2d 794; *Acker v. Guinn* (Tex.1971), 464 S.W.2d 348; *West Virginia-Pittsburgh Coal Co. v. Strong* (1947), 129 W.Va. 832, 42 S.E.2d 46.

Id. at 318.

In *United States v. Polino*, 131 F.Supp. 772 (N.D.W.Va. 1955), the court considered whether a reservation of coal in a deed conveying land to the United States for inclusion in the Monongahela National Forest in West Virginia included the right of the grantor to strip mine. As in *Belville Mining* and the situation here, the national forest land at issue in *Polino* was acquired pursuant to the Weeks Act. And, as in *Belville Mining* and the situation here, the deed in *Polino* did not expressly reserve the right to strip mine.

The court noted that strip mining necessarily involved “completely disturb[ing]” the surface and that:

It is beyond all reason to conclude that the parties to the deed by which the United States acquired title to these lands, at the time of the execution of such deed, had

in contemplation the possible complete destruction and removal of the entire surface of said lands, together with everything growing thereon.

United States v. Polino, 131 F.Supp. 772, 776 (N.D.W. Va. 1955). The court subsequently concluded that:

[B]oth parties to the deed which contained the mineral reservation knew that the United States was acquiring these lands for forestry purposes and that such lands would be of little or no use for such purposes if the surface, the timber and other growth could be totally removed and destroyed.

Id. at 777. Thus, as in *Belville Mining*, the *Polino* court refused to read strip mining into the deed conveying land to the United States for national forest purposes.

Beyond the case law on this matter, the Weeks Act itself contains the assumption that strip mining will not be permitted on Weeks Act lands. For example, Section 9 of the Weeks Act, 16 U.S.C. § 518, states that the acquisition of private lands for national forest purposes:

Shall in no case be defeated because of located or defined rights of way, easements, and reservations, which, from their nature will, in the opinion of the Secretary of Agriculture, in no manner interfere with the use of the lands so encumbered, for the purposes of this Act.

16 U.S.C. § 518. As a special provision is included to allow purchase of lands with reservations when the reservation will *not* interfere with the use of the encumbered lands, it must be that the purchase of land with reservations that *will* interfere with the use of the encumbered lands is not authorized. In other words, if the deed allowed mining to interfere with the use of the land for timber and watershed protection, it would not have been accepted in the first place.

The actual situation is that PolyMet is asserting a property right that it does not have, and the Forest Service is rolling over. Deeming the situation a “fundamental conflict” that must be resolved simply hides the fact that the Forest Service is letting a private corporation dictate what is done with public land when that corporation has no right to do so. Because there is no “fundamental conflict” that needs to be resolved, the Forest Service should withdraw the Land Exchange Proposed Action and continue managing the Federal lands for national forest purposes.

B. Approval of the Land Exchange Proposed Action Would Set a Terrible Precedent and is Poor Public Policy

The Land Exchange Proposed Action would establish a terrible precedent for the future of the Superior National Forest and other forests that mining companies would like to strip mine. It is unclear whether the Forest Service has ever before considered exchanging forest service lands with a corporation so that the corporation could strip

mine those lands, particularly when the deed does not grant that right. According to documents obtained through a Freedom of Information Act (FOIA) request, it appears that actions such as the Land Exchange Proposed Action are at the least uncommon. For instance, in an August 27, 2007 email, Mark E. Schwab, a Forest Service geologist in the Tonto National Forest, sent the following email to Loretta Carter, a Forest Service geologist in the Superior National Forest:

I asked Mike Linden if [he] knows of any good examples of similar cases in R3 in the EIS phase as your case... we're both drawing a blank. Mike suggested the Resolution Copper project near Globe, AZ – but that case is a proposed Legislative exchange, with FS surface & minerals, under mining claims. We'll keep thinking about it, and hopefully come up with suggestions.

USFS FOIA response at 002324 (Ex. 85). After “drawing a blank” on national forest lands, the Forest Service then sought advice from the Bureau of Land Management (BLM) on how to develop the Land Exchange Proposed Action. On August 27, 2007, BLM employee Al Burch emailed Mr. Schwab and Ms. Carter stating that:

We have no situations here in AZ BLM that equate to an exchange that includes the private mineral – federal surface scenario, i.e., where the federal government is really in the same position as surface owner when the action is being driven by the need / desire to develop the mineral resources.

USFS FOIA response at 002321 (Ex. 85).

This inability to recall similar situations indicates that this is not the path the Forest Service has taken in the past when facing a holder of mineral rights who wants to strip mine a national forest. Perhaps this is because national forest managers have consistently found that strip mining the national forest is not in the public interest. As noted above, the Forest Service position in this case is in sharp contrast to the government's position in *Belville Mining*, a case that involved a very similar situation in the Wayne National Forest in Ohio. The type of mining that PolyMet proposes--a large open pit surface mine--involves destroying the entire surface in a manner that was not included in the rights of the mineral estate holder when the land was purchased by the federal government. That should be the end of the story.

It is imperative that the Forest Service follow a consistent policy for mineral reservations that do not include the right to destroy the land surface. An inconsistent policy will only make litigation more likely in cases where the Forest Service decides to decline the request for a land exchange. This is somewhat ironic, as it seems that the fear of litigation is what is actually driving the decision in this case. If the Forest Service acquiesces to the mining company's position here, every future scenario that mirrors this one will become loaded with the expectation that the Forest Service will exchange land to facilitate strip mining. If the Forest Service continues to frame this situation as a “fundamental conflict” that needs resolution, rather than as a case of a mining company trying to exercise rights that it does not have, all of the Forest Service deeds with

restrictions on mining methods will be headed for litigation whenever the Forest Service dares to uphold its own rights according to the deed.

If the Forest Service is to avoid the complete evisceration of its authority to protect national forest lands from strip mining, it *must* adopt, at the very least, a policy of relying on and defending deed restrictions. A policy of exchanging lands whenever a mineral estate holder wishes to strip mine, regardless of the provisions of the deed, would place the delineation of the national forests in the hands of the mining industry. It would also facilitate the destruction of lands that the federal government identified and purchased for their value as national forest whenever those lands stand in the way of money.

C. The Land Exchange Proposed Action Should Be Withdrawn Because the Exchange Does Not Meet the Purpose of the Action

As stated in the SDEIS Executive Summary, the purpose of the Proposed Action is to “resolve the conflict between the surface estate owned by the United States and the private mineral estate.” SDEIS at ES-10. However, virtually all of the land that is proposed for exchange contains the same conflict. The Forest Service proposes to resolve a split estate by exchanging land for other land that also has a split estate.

And this is only the half of it. Much of the land that the Forest Service will receive will be subject to outstanding rather than reserved rights. The outstanding rights are in the hands of a third party, not subject to the current transaction, and thus cannot be encumbered by restrictions in the deed. Unless the current deeds contain clauses that protect the surface (and it appears that few of them do), the titles that the Forest Service receives will be inferior to the title that it holds now. It is extremely difficult to perceive how this will meet the need of resolving a conflict in the title to lands.

We recognize that the Forest Service is relying on assessments indicating that the non-federal parcels do not contain minerals worth exploiting. However, we have also seen how that situation can change. Given that the most recent forest planning process and environmental review did not address mining, apparently in the not-so-distant past, no one believed that the minerals at issue here would be worth exploiting within this decade. These deeds are documents that will govern the use of the land not for decades, but for centuries. Land deeds are the most permanent documents that humans have devised. Can we really know that minerals will never be found on these properties, and that mining them will never prove lucrative?

We also note that these assessments were done by the same firm that did most of PolyMet’s technical and scientific work. SDEIS at 5-578. We are not casting aspersions on Barr Engineering when we say that this firm has a conflict of interest and should not have been contracted for this work. This is simply a matter of professional standards and avoiding the possibility of unconscious bias.

At any rate, regardless of the risk of exploitable minerals, the split between the land and minerals will remain, often with the mineral estate enjoying a greater right to destroy the surface than does PolyMet. This failure to meet the purported purpose of the Proposed Action exposes its actual purpose, which is to facilitate PolyMet's desire to strip mine the property. Transforming that into a need to resolve a conflict in the title is simply using regulatory objectives to mask the fact that the Forest Service has no legitimate reason to propose this exchange.

The Forest Service has no reason of its own to give up the land it is considering transferring to PolyMet, and no reason of its own to prefer the land that PolyMet would transfer to the Forest Service. The entire driver for this exchange is to give a private corporation the means to make as large a profit as possible. This is not a legitimate purpose for an exchange of national forest property, and the Forest Service should thus withdraw the Proposed Action.

D. *The Land Exchange Proposed Action Should Be Withdrawn Because it Does Not Well Serve the Public Interest.*

Before the Forest Service may approve the Land Exchange Proposed Action, it must first make a "determination [] that the public interest will be well served." 36 C.F.R. § 254.3(b). The Forest Service must consider the following factors in its public interest determination:

- Opportunities to achieve better management of Federal lands and resources;
- Needs of State and local residents and their economies; and
- Securing important objectives, including but not limited to:
 - Protection of fish and wildlife habitats, cultural resources, watersheds, and wilderness and aesthetic values;
 - Enhancement of recreation opportunities and public access;
 - Consolidation of lands and/or interest in lands, such as mineral and timber interests, for more logical and efficient management and development;
 - Consolidation of split estates;
 - Expansion of communities;
 - Accommodation of existing or planned land use authorizations;
 - Promotion of multiple-use values;
 - Forest Plan implementation;
 - Fulfillment of public needs.

C.F.R. § 254.3(b)(1). To determine that "the public interest will be well served" by the proposed land exchange, the Forest Service must find that:

- The resource values and the public objectives served by the non-Federal lands or interest to be acquired equal or exceed the resource values and the public objectives served by the Federal lands to be conveyed, and

- The intended use of the conveyed Federal land will not substantially conflict with established management objectives on adjacent Federal lands, including Indian Trust lands.

36 C.F.R. § 254.3(b)(2).

Before addressing these factors, however, it is necessary to explore what is meant by the “public interest will be well served.” We submit that this is a more rigorous standard than one that simply calls for an action to be “in” the public interest. For example, 16 U.S.C. § 521d authorizes the Secretary of Agriculture, if it is “in the public interest,” to “sell, exchange, or interchange by quitclaim deed, all right, title, and interest, including the mineral estate, of the United States in and to National Forest System lands described in section 521e of this title[.]”

16 U.S.C. § 521e permits the sale, exchange, or interchange of small parcels (40 acres or less) and road rights-of-way that are “substantially surrounded by lands not owned by the United States and which are no longer needed by the United States.” Such authority is used to convey much smaller parcels of Federal land than the one at issue here. Thus if the Forest Service sought to dispose of a 5-acre parcel that had originally been acquired and intended for an administrative site such as a Forest Service ranger station, the Forest Service could propose to sell that parcel under 16 U.S.C. § 521e if it makes a determination that it is “in the public interest” to do so. Such a sale, however, does not necessarily meet the requirement that the public interest be “well served.”

The regulations implementing 16 U.S.C. § 521e support the distinction between “in the public interest” and the “public interest will be well served.” For instance, 36 C.F.R. § 254.36(b) states that “conveyances must be determined to be in the public interest.” The following regulation lists criteria that must be considered “in determining when the public interest *will be served*.” 36 C.F.R. § 254.36(c) (emphasis added). Based on the plain language of the statutes and regulations, the “public interest will be *well served*” standard requires a more compelling rationale for the proposed action and a more rigorous consideration of the public interest values at stake. The Forest Service cannot simply make a determination that the proposed land exchange is “in the public interest.”

As explained below, the public interest is not well served by the proposed land exchange. As a result, the Forest Service should withdraw the Land Exchange Proposed Action.

1. Opportunities to Achieve Better Management of Federal Lands and Resources

The SDEIS states that seven “impact indicators” regarding land use were used to identify anticipated outcomes of the Land Exchange Proposed Action. SDEIS 5-577. These seven impact indicators are: 1) net change in the number of acres controlled by the Forest Service; 2) net change in the length of the boundary around Forest Service-controlled land; 3) net change in the level of land fragmentation; 4) degree of access to lands owned by the Forest Service; 5) degree of compatibility between Forest Service management areas and zoning/land use designations; 6) potential for mineral development within the non-Federal parcels proposed for acquisition; and 7) quality of title within each of the non-Federal parcels proposed for acquisition.

It is unclear why these seven factors were chosen or how they fit into the regulatory scheme described above. As a whole, the list seems to address ease of management of federal lands and resources. If that is the intention, however, it seems to have been lost in the SDEIS discussion, which does not include all of the regulatory factors listed above. In fact, we did not find an explicit discussion of the regulatory factors in the SDEIS.

The SDEIS also does not specify how the seven impact indicators are weighted, or how they will be used. It is unclear whether the Forest Service intended them simply as criteria that the parcels offered by PolyMet had to meet before the exchange would be considered, or whether they are being weighed in the public interest balance. If they are being weighed in the public interest balance, it is unclear how the regulatory factors will be factored in.

In an attempt to view this through the lens of common sense, the seven impact indicators actually seem appropriate to apply as criteria to decide whether the identified non-federal parcels meet minimum requirements to be considered for an exchange. It makes sense that the Forest Service would want to make sure that an exchange does not: 1) result in fewer acres under Forest Service protection; 2) result in more boundary miles; 3) result in greater land fragmentation; or 4) result in less accessibility. It also makes sense that the Forest Service would want to ensure that the acquired lands: 5) were compatible with zoning and land use designations; 6) had low potential for mineral development; and 7) had good quality of title.

The factors do not make sense, however, as a list by which to compare the federal and non-federal lands. Using it in this way elevates a few factors of the public interest review above all others. Furthermore, it inappropriately elevates minor considerations regarding ease of management. For instance, the net change in boundary management that would result from the proposed land exchange is a reduction of 33.2 miles. SDEIS 5-580. This represents a net reduction of just 0.003%, and is statistically insignificant. It would thus be inappropriate to give this factor any weight in the public interest balance, as it is statistically insignificant.

In particular, this review seems to elevate public access as some sort of key value. The SDEIS states,

The 6,495.4 acres of federal lands are not accessible for public use via land (see Section 4.2.11), while substantial portions of the non-federal lands do have public access via public roads or hiking trails. The distinction is a factor in evaluating land use effects because public access defines the degree to which the lands in question can actually be used – either by the public for recreational purposes, by forestry interests for economic purposes, or for research and conservation purposes (in the case of Riparian Emphasis and cRNA management areas, defined in Section 4.3.1).

SDEIS 5-579. The apparent definition of the word “use” here ignores the many benefits provided by the federal land. In fact, these lands most likely provide better wildlife habitat and less degraded riparian areas because they are inaccessible. By all accounts, this is extremely high-value land, ecologically speaking. One would hope that the Forest Service would be more interested in the ecological value of the land than in how much money can be made from it.

It is curious that the Forest Service seems to be justifying the exchange of these lands by emphasizing their inaccessibility. When these lands were acquired, the Forest Service clearly believed that they would further Forest Service objectives. Furthermore, the lands were most likely placed in the General Forest – Longer Rotation MA for a reason. It would be helpful to know what that reason is, and whether it will be served by a land exchange.

We submit that the proposed land exchange does not promote opportunities for better management of Federal lands and resources. The land that will be lost is a large, unfragmented area of high biodiversity, with rare plants and hundreds of acres of high quality, pre-European condition wetlands. It is unclear why or how management needs to be improved over the manner in which this parcel has been managed until now. Once again, because the Forest Service has no real reason of its own to give up this land, there simply seems to be no need for “opportunities for better management.” While we appreciate the use of the listed “indicators” to ensure that management opportunities will not in fact be *less* with the acquired lands, the way this exercise has been conducted is as a solution looking for a problem.

2. Needs of State and Local Residents and Their Economies

The second factor the Forest Service must consider in its public interest determination is the needs of state and local residents and their economies. 36 C.F.R. § 254.3(b)(1). First, it must be pointed out that in considering this factor, the Forest Service cannot ignore its obligation to manage the Superior National Forest in trust for all Americans, not just state and local residents. The Superior National Forest, like all national forests, is part of “a nationally significant system dedicated to the long-term benefit for present and future generations[.]” 16 U.S.C. § 1609(a). Thus, while the needs

of state and local residents should be considered, such views should not be weighted so heavily that economic interests skew the analysis away from Forest Service objectives.

According to the SDEIS, PolyMet describes its need for the NorthMet Project as follows:

The need for the NorthMet Project is driven by domestic and global demand of these products. Demand continues to rise for these metals due to the expansion of the green economy and rising demand from developing countries like India, China, and Brazil. Based on the closure of LTVSMC and other job losses in northeastern Minnesota, there is also a need for jobs and economic development in the area.

SDEIS 1-11.

However, the SDEIS provides no support for the insinuation that these metals are needed. An often-forgotten fact is that “need” and “demand” are not the same thing. Copper in particular is used for very many things for which it really is not needed. And consumer demand for products containing all of these metals is something that should be discouraged rather than encouraged, because of the enormous impact mining and processing has on the environment.

Basic economics tells us that the predictable outcome of increasing supply is decreasing price, which fuels greater demand. This is not something to be encouraged in light of the global climate crisis and other pressing environmental issues. In the example of coal, the U.S. Eighth Circuit Court of Appeals has recognized that increasing the supply is likely to increase the demand, with negative impacts on the environment. See *Mid States Coalition for Progress v. Surface Trans. Bd.*, 345 F.3d 520 (2003). The Forest Service cannot simply accept the invocation of “demand” and “green economy” to provide a positive economic basis for this project. In determining whether the proposed land exchange well serves the public interest, it must first determine if the purported public interest is even a positive one.

In its consideration of the local community, the Forest Service must give special consideration to the needs of indigenous people in this area, particularly in light of the Federal government’s duties as a trustee. According to the SDEIS, in addition to making the Mine Site unavailable for subsistence use,

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 resident.

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.

SDEIS 5-509.¹⁰ The impacts of mercury and sulfate pollution on both the health and the livelihood of native people in Northeastern Minnesota is unconscionable, and the Forest Service should not add to it by facilitating an open pit mine on what is currently Forest Service property.

As for employment related effects, we note that the SDEIS deems the effects “minimal.” First, it acknowledges that “employment related to the construction phase” would have “minimal effects” that would be “relatively short-lived (e.g., for no more than the 36-month overall construction phase).” SDEIS 5-501. The SDEIS then states that during a typical year of operations, the proposed mine “would increase study area employment by approximately one percent.” SDEIS 5-501. After mine closure, the SDEIS states that “[a]ny increase in study area unemployment during and after closure – resulting from individuals who remain in the study area workforce but who cannot find jobs – *would be minimal.*” SDEIS 5-502 (emphasis added).

The SDEIS further states that there should be little to no employment impacts following closure of the proposed mine “given the relatively small number of jobs” that would be created by NorthMet Project Proposed Action. If any increase in unemployment after the mine closes would be minimal, any increase in employment from the mine would be minimal as well.

Furthermore, the local economic impacts of relying on mining for economic development are more likely to be negative than positive in the long term. The discussion of this issue above in the section on economic impacts is especially pertinent to the Forest Service’s decision.

Finally, as discussed above, the Proposed Project would present long-term threats to local water quality should the Forest Service approve the proposed land exchange. Those threats will remain for centuries, and could have an extreme negative impact on local residents and their economy. The Forest Service must take account of these negative impacts as well as positive ones in weighing impacts on the economy in its public interest review.

3. Securing Important Objectives

Forest Service regulations require giving full consideration to “secur[ing] important objectives, including but not limited to:”

¹⁰ As explained above, it is untrue that the project would decrease mercury concentrations in the Partridge River. The mercury analysis does not include mercury from air emissions—but it does include sufficient information to determine that inputs from air deposition would be larger than the purported decrease.

protection of fish and wildlife habitats, cultural resources, watersheds, and wilderness and aesthetic values; enhancement of recreation opportunities and public access; consolidation of lands and/or interests in lands, such as mineral and timber interests, for more logical and efficient management and development; consolidation of split estates; expansion of communities; accommodation of existing or planned land use authorizations (§254.4(c)(4)); promotion of multiple-use values; implementation of applicable Forest Land and Resource Management Plans; and fulfillment of public needs.

36 C.F.R. § 254.3(b)(1). We address each of these objectives below.

a. Protection of Fish and Wildlife Habitat, Cultural Resources, Watersheds, and Wilderness and Aesthetic Values

The proposed land exchange is a necessary pre-requisite for the NorthMet Project Proposed Action to move forward. Should the Forest Service approve the proposed land exchange, there would be substantial and permanent destruction of fish and wildlife habitat, including critical habitat for Canada lynx and gray wolf. There would also be substantial and long-lasting impacts to watersheds, including thousands of acres of wetlands. There would also be impacts to cultural resources and wilderness and aesthetic values. The impacts to these values clearly demonstrate that the proposed land exchange does not well serve the public interest.

The Land Exchange portion of the SDEIS focuses on losses to the federal estate; because the Forest Service is exchanging land for the Mine Site, those losses are minimized. But the public interest review is not limited to impacts on the federal estate; the question is, taking account of all the ramifications, would the public interest be well served. In addition, NEPA requires the Forest Service to consider all of the environmental impacts of its actions, which clearly include the impacts of the proposed mine.

i. The Land Exchange Proposed Action Would Have Unacceptable Impacts on Watersheds and Wetlands

Earlier sections of these comments explain the negative impacts of this project on waters and wetlands throughout the project area. These are all impacts of the Land Exchange Proposed Action, and should be considered in the public interest review. These impacts include increased mercury loads; increased sulfate in wetlands, which contributes to mercury methylation and the production of hydrogen sulfide; violations of the water quality standard for lead; and potential violations of other water quality standards. In addition, the Proposed Project will impact hydrology. Wetland impacts and the deficiency of the SDEIS on this issue are also discussed above.

Should the Forest Service approve the proposed land exchange, the NorthMet Project would destroy at least 912.5 acres of very high-quality wetlands, and would

indirectly impact thousands more. These wetlands have been recognized by EPA as aquatic resources of national importance. This would be the largest wetland impact ever permitted in the state of Minnesota, in one of the wettest regions in the country. The compensatory mitigation plan has not yet been finalized, and is rife with problems. No compensatory mitigation has been identified for indirect impacts, and it is unclear whether such mitigation will be required. If this project is approved as it is currently proposed, the St. Louis River watershed will lose an enormous amount of wetlands. It defies belief that the Forest Service could believe that the minimal public benefit of this project could outweigh the destruction of this amount and quality of wetlands, particularly in conjunction with all of the other environmental impacts of the project.

We quote here from the EPA comments on the original DEIS for the NorthMet Proposed Action:

Based on our review of the DEIS, EPA has rated the DEIS as Environmentally Unsatisfactory – Inadequate, or EU-3. Environmentally Unsatisfactory (EU) indicates that our review has identified adverse environmental impacts that are of sufficient magnitude that EPA believes the proposed action must not proceed as proposed. The numeric portion of the rating indicates the DEIS does not present adequate information for the EPA to fully assess the environmental impacts that should be avoided in order to fully protect the environment or EPA identifies reasonably available alternatives which could reduce the environmental impacts of the action. This rating applies to the Proposed Action, the Mine Site Alternative and the Tailings Basin Alternative. Our summary of ratings definitions is enclosed.

EPA has assigned the EU rating because our review of the DEIS determined that the proposed action *will result in environmentally unsatisfactory water quality impacts*. Specifically, EPA believes that the project *will exceed water quality standards* because of discharges during the life of the mining operation and on a long-term basis, including the post-closure period. These water quality impacts are largely related to water that contacts acid-generating waste rock and mine faces and to wastewater escaping the tailings basin through seeps and in groundwater. *EPA also finds the wetlands mitigation plan environmentally unacceptable because it does not provide mitigation for all impacts to wetlands, particularly for indirect impacts.*

EPA has assigned the Inadequate (3) rating to the DEIS because EPA believes that *the analyses of the hydrogeological profiles at both the mine and processing sites are inadequate to determine the full extent of impacts or to justify mitigation options*. Consequently, we believe that the DEIS likely *underestimates water quality impacts and that the project is likely to have additional unmitigated long-term discharges*. EPA has identified *information gaps relating to groundwater impacts, groundwater-surface water interaction, tailings basin stability and containment, and groundwater discharges to surface water*. . . . The DEIS does

not provide information on financial assurance, which EPA believes critical to the decision-making process when long-term impacts and mitigation are involved.

EPA letter of Feb. 18, 2010 (Ex. 1) (emphasis added). The EPA's 2010 comment letter further states:

EPA finds this project may have *substantial and unacceptable adverse impacts on aquatic resources of national importance (ARNI)*. EPA believes the coniferous and open bogs, comprising a large percentage of the approximately 33,880 total wetland acres, within the Partridge River Watershed to be an ARNI due to the values they provide in terms of unique habitat, biodiversity, downstream water quality, and flood control specifically, to the Lake Superior Watershed and the Great Lakes Basin.

With impacts to over 1,000 acres of wetlands, the DEIS provides *incomplete and inadequate compensation for the loss of wetlands and their function*. Indirect impacts to wetlands are *not completely identified or compensated for* in the mitigation plan. EPA also believes that some of the mitigation offered for direct impacts is inadequate, given that the type and function of wetlands impacted is difficult to replace...Insofar as the DEIS for this project is the chief environmental document supporting the issuance of the USACE CWA Section 404 permit, *a revised or supplemental DEIS should identify and describe mitigation for all impacts*. It should also include wetland monitoring plans and adaptive management plans, *especially related to indirect impacts to mine site wetlands*.

Id. at 3 (emphasis added). Many of the factors identified in the EPA's 2010 comment letter remain unaddressed.

The Forest Service has an independent duty to assess this wetland loss, pursuant to both NEPA and its public interest review. It cannot simply assume that mitigation for any impacts will be addressed by other agencies, when the mitigation plan and the amount of mitigation are far from clear. Rather than addressing impacts on floodplains and wetlands in the SDEIS, the Forest Service assumes that the impacts will be mitigated. SDEIS 5-595; 5-598.

Similarly, with regard to monitoring the impacts to wetlands, the SDEIS states:

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. Permit conditions *would likely* include an adaptive management plan to account for any additional effects that may be identified in the annual monitoring and reporting.

SDEIS 5-273 (emphasis added). Without the mitigation and monitoring plans, it is impossible to judge what the impacts of the Proposed Project will be. This does not

satisfy the Forest Service's present obligation to determine whether the "public interest will be well served" should the Forest Service approve the proposed land exchange, nor does it satisfy the obligation under NEPA to independently review the impacts of a proposed project.

In *Center for Biological Diversity v. Department of Interior*, the Ninth Circuit states,

Without an accurate picture of the environmental consequences of the land exchange, the BLM cannot determine if the "public interest will be well served by making the exchange, and the Secretary cannot determine if the "values and objectives" which the selected lands "may serve if retained in Federal ownership are not more than the values" of the offered lands.

Center for Biological Diversity v. Dept. of Interior, 623 F.3d 633 (9th Cir. 2010).

As the Land Exchange section of the SDEIS focuses on acreage of wetlands in the federal estate, we again emphasize that transferring those parcels to the Forest Service would not increase wetland acreage or mitigate in any way for the wetland losses at the Mine Site. Furthermore, the wetlands at the Mine Site are far more contiguous and of higher overall quality than those scattered across the various parcels of the non-federal land. The SDEIS states,

Most of the wetlands that would be affected by the NorthMet Project Proposed Action would be of pre-European settlement condition and rate at the highest Floristic Quality Assessment levels for those plant communities in Minnesota. MnRAM vegetative diversity/integrity rating would be "exceptional" for these pre-European settlement condition wetlands.

SDEIS 5-313.

According to the SDEIS, the most common wetland types within the federal lands are coniferous bogs (approximately 47 percent) and coniferous swamps (31 percent). The most common wetland types within the five non-federal tracts are coniferous swamps (approximately 69 percent) and shrub swamps (approximately 23 percent), which includes both alder thickets and shrub-carr wetlands. SDEIS 4-447. According to a footnote for Table 4.3.3-4, however, "field data for coniferous bogs and coniferous swamps was combined" for the non-federal lands. SDEIS 4-447.

The Co-Lead Agencies must disclose the percentage of the non-Federal lands that contain coniferous bogs just as they did for the Federal lands. Coniferous bogs make up the majority of wetlands on the federal lands. By combining coniferous bogs and coniferous swamps on the non-federal parcels, the SDEIS obscures how many acres of coniferous bogs are potentially being lost to the federal estate due to the NorthMet Project and Land Exchange Proposed Actions.

In addition to the public interest review, a land exchange that facilitates wetland destruction does not comply with the Forest Plan. The Forest Plan directs that “wetland impacts will be avoided whenever possible.” USFS, Land and Resource Management Plan, Superior National Forest (USFS 2004b) at 2-15. It is clearly “possible” to avoid wetland impacts in this case since PolyMet’s deed does not allow it to open-pit mine, and the Forest Service is not obligated to go forward with the land exchange. Land exchanges are “discretionary and voluntary real estate transaction[s] between the Federal government and a non-Federal party[.]” Forest Service Handbook 5409.13 § 31. Since the impacts to these wetlands are entirely avoidable, the Forest Service has an obligation to protect them rather than facilitating their destruction.

The Forest Plan also states that “wetlands will be managed to prevent the reduction of their water quality, fish and wildlife habitat, and aesthetic values. Management actions will not reduce water quality within a wetland, or upstream or downstream of a wetland, unless restoration of natural conditions is the primary goal of the activity.” USFS 2004b at 2-15.

The Forest Service’s “management action” here, the Land Exchange Proposed Action, will most certainly “reduce water quality within a wetland, or upstream or downstream of a wetland.” As restoring natural conditions is not a goal of the activity – whether of the land exchange, or the mine – the Land Exchange Proposed Action does not conform to the Forest Plan, and must be withdrawn.

ii. The Land Exchange Would Destroy Habitat for Important Wildlife Species

There is no question that the proposed project would destroy more than two square miles of federally-designated critical Canada lynx habitat, and despite wetland mitigation and a proposed land exchange, those two square miles will be a net loss in critical habitat. This loss would violate the Endangered Species Act, and this alone precludes the Forest Service from accepting the land exchange. Impacts on lynx and lynx habitat are discussed above.

The ESA requires that “all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this chapter.” 16 U.S.C. § 1531(c)(1). By voluntarily agreeing to initiate the exchange process and move toward a final decision, the Forest Service is violating its obligation “to conserve endangered species and threatened species” and is not “utilize[ing] [its] authorities in furtherance of” the ESA.

In addition, the federal lands appear to provide excellent moose habitat. The Superior National Forest is the last remaining refuge for moose in Minnesota, where the species is declining precipitously. The SDEIS barely mentions moose, and does not assess impacts of the Proposed Project on this species, which is listed as of special concern by the State of Minnesota. Finally, the project may have significant impacts on

migratory birds; this issue has been insufficiently assessed. Moose and migratory birds are also both discussed above.

We also note that the land exchange would result in a very significant loss of General Forest-Longer Rotation management area (MA). This is an area of High Biodiversity Importance; acreage of this quality will also be lost. It thus appears that the forest will lose biodiversity, and the value of biodiversity to wildlife.

iii. The Land Exchange Would Not Protect Cultural Resources and Wilderness and Aesthetic Values

Impacts to cultural resources from the Proposed Project would be extensive, and are important enough that the Forest Service should follow the wishes of the Tribes regarding impacts. The Forest Service must weigh this factor heavily in its public interest review, and must not facilitate a project that would further destroy resources that are so important to Tribes in the region.

Regarding scenic integrity objectives (SIOs), the SDEIS states that it used SIO definitions in the Forest Plan for evaluating the Federal lands but used a 1995 Forest Service publication to evaluate the non-Federal lands. SDEIS 4-349. The discrepancy is not explained. The SDEIS needs to provide sufficient information to determine whether this difference could lead to inaccurate comparisons.

Regarding impacts to wilderness, a Class I Visibility Analysis using Method 2 indicated that “visibility impacts greater than 5 to 10 percent could occur at some point within the BWCAW on a small number of days each year.” SDEIS 5-415. The cumulative impacts of air pollution on visibility within the BWCAW are already substantial, and the State admits that its plan will not meet visibility goals. It is thus not in the public interest to facilitate the air emissions that will result from the Proposed Project. Impacts on Class I visibility are discussed above.

b. Enhancement of Recreation Opportunities and Public Access

According to the SDEIS:

Tracts 1 and 5 also have the potential for recreational use (whereas the federal lands are not easily accessible for *any* purpose). To the degree that the USFS manages these lands (and the other non-federal lands) for active recreational activity, the Land Exchange Proposed Action could increase economic activity associated with recreation and tourism. The non-federal lands comprise less than half of 1 percent of the 2,171,603.9 acres of Superior National Forest that are managed by USFS, so any such increase would be small.

SDEIS 5-680.

It is somewhat ironic that the Forest Service seems to be using the excuse of a lack of accessibility to justify disposing of land. Inaccessible land is of great value to wildlife, to the preservation of biodiversity, and for the maintenance of a clean and livable environment. These are all values the Forest Service should foster. We know of no other entity that is more appropriate as the owner and manager of inaccessible forest and wetlands than the U.S. Forest Service. We doubt that as a general matter, the Forest Service takes the position that lands that are rarely visited and are not easily accessible are lands that should be gotten rid of. Instead, it seems that the emphasis on accessibility in the SDEIS is simply a justification for giving up this particular property. The Superior National Forest is not short of accessible recreational lands, and there is no reason why this factor should receive so much emphasis in the SDEIS or the public interest review.

Furthermore, the SDEIS admits that the acquisition of the widely scattered non-Federal parcels would have a “small” impact on recreation. We would argue that the effect would be imperceptible. On the other hand, the destruction of thousands of acres for an open pit mine, increased truck traffic, increased noise, air, and water pollution, among other impacts, could have a much larger impact on recreation. Overall, the impact on recreation is more likely to be negative than positive.

c. Consolidation of Lands and/or Interests in Lands, and Consolidation of Split Estates.

These objectives are essentially the same in this context, and are treated here as one.

i. The Land Exchange Well Serves Private Interests Rather than the Public Interest.

In terms of policy, the Forest Service should primarily consolidate split estates in situations where the Forest Service consolidates its own holdings. The Forest Service should not be in the business of exchanging land that was acquired for national forest purposes in order to consolidate the surface and subsurface to benefit a private corporation. That may well serve PolyMet’s interests, but it does not well serve the public interest. Moreover, the fact that the Forest Service would receive split estate lands in return demonstrates that the objective of consolidating estates would not be served.

We have not been able to identify another land exchange situation in which the Forest Service made an administrative decision to accept split-estate land in an action whose stated purpose was to consolidate land holdings. For example, in *Center for Biological Diversity v. Department of Interior*, the Ninth Circuit considered a land exchange between the BLM and a mining company. First, the court described the “selected lands” that would be given to the company:

The United States owns, and the BLM administers as full estates, 8,196 acres of the selected lands. The remaining 2,780 acres of the selected lands are owned and administered as “split estates.” Asarco owns or is purchasing, in transactions not

at issue in this appeal, the surface estate of these lands, while the United States owns and the BLM administers the mineral estate.

Center for Biological Diversity v. Dept. of Interior, 623 F.3d 633, 637 (9th Cir. 2010). The court then described the “offered lands” the United States would receive through the exchange:

The offered lands comprise five parcels or group of parcels: the Knisely Ranch Parcels (160) acres, the Gila River Parcel (320 acres), the Tomlin Parcels (320 acres), the McCracken Mountain Parcels (6,384 acres), and the Sacramento Valley Parcel (120 acres). Following the land exchange, no mining claims would exist or be permitted on the Knisely Ranch Parcels. The BLM would petition to withdraw the Gila River Parcel and Tomlin Parcels from mineral entry, which, if successful, would mean that only persons who had established a valid mining claim before withdrawal would be permitted to mine on those parcels. *Clouser v. Espy*, 42 F.3d 1522, 1524-25 (9th Cir. 1994). The McCracken Mountain Parcels, which comprise 87% of the offered lands, and the Sacramento Valley Parcel would remain open to mineral entry. Of the 7,300 acres of offered lands, 1,126 acres exhibit moderate potential for locatable mineral resources, with the rest exhibiting low potential for locatable mineral resources.

Id. at 638.

In other words, although many of the “offered lands” that would come into Federal ownership would remain open to mineral entry pursuant to the 1872 mining law, none of the “offered lands” involved split estates. Without speaking to the adequacy of the environmental analysis in this case or whether the land exchange well served the public interest, at least the “offered lands” coming into Federal ownership involved consolidated surface and mineral estates. In fact, the exchange was a mutual consolidation. Here, however, the exchange consolidates PolyMet’s land interests, but does not consolidate the Forest Service land interests. In fact, as explained above, the Forest Service will have less right to limit mining on the new lands than it had on the old. This does not well serve the public interest.

ii. The SDEIS Must Disclose the Nature of the Mineral Rights on the Federal and Non-Federal Lands

The SDEIS does not adequately describe the nature of the mineral estates underlying the Federal and non-Federal parcels proposed in the exchange. This is an important consideration because of the difference in the ability of the Forest Service to protect the surface estate depending on whether the mineral rights are “reserved” or “outstanding.” This information should have been disclosed in the SDEIS, and must be disclosed before a decision is made regarding the land exchange.

Reserved minerals are those “minerals rights retained by a grantor in a deed conveying land to the United States.” Forest Service Manual 2830.5(2) (Ex. 83).

Outstanding minerals are “those rights owned by a party other than the surface owner at the time the surface was conveyed to the United States.” *Id.* 2830.5(4). According to the Forest Service, “[t]he authority for the administration of mineral reservations is 36 CFR 251.15 or previously issued Secretary of Agriculture’s rules and regulations that govern the exercise of mineral rights reserved in conveyances to the United States.” *Id.* 2830.1. However, the Forest Service Manual states that the “Secretary’s rules and regulations do not apply to the administration of outstanding mineral rights.” *Id.*

This distinction is not explained in the SDEIS even though it appears that most of the privately owned minerals underlying the Federal lands are reserved mineral rights while the mineral rights underlying the non-Federal lands include both reserved and outstanding mineral rights. Furthermore, it is unclear from many of the descriptions of the nonfederal tracts whether mineral rights are outstanding or reserved. Clear information must be disclosed in the EIS and factored into the public interest determination and the equal value determination. The Forest Service must consider the ramifications of exchanging land where the administration of mineral rights is subject to rules and regulations of the Secretary of Agriculture, for land where it is not.

Considerations affecting each non-Federal parcel are addressed below.

A. Tract 1 (Hay Lake Lands)

According to the SDEIS:

PolyMet currently owns surface rights to Tract 1. The tract is subject to a mortgage in favor of Iron Range Resources, which would be satisfied at closing of the Land Exchange Proposed Action (USFS 2011c). Title to this parcel has been reviewed and approved by the USDA, Office of General Counsel so long as certain recommended affirmative title insurance is provided (USFS 2011c).

Tract 1 was assessed for mineral resource potential as part of the Feasibility Analysis completed in 2009 (USFS 2009c). The geology of the area is mostly granitic rocks with the southwestern-most part underlain by metamorphosed basalts, gabbros, and sedimentary rocks. The mineral potential for the tract was determined to be limited, as granitic rocks are not known to host mineral deposits. The MDNR core library index showed no drilling on or near the area. Additional investigation in 2011 indicates potential for aggregate production from the northeastern corner of the tract along the Pike River. Tract 1 appears to have a low potential for exploration or development of bedrock or surficial deposits (Barr 2011c).

SDEIS 4-391; 4-395.

First, the Forest Service must disclose how PolyMet plans to satisfy its mortgage at closing. In some situations, the Forest Service allows the reservation of timber rights in land exchanges as part of the financial arrangements. Under no circumstances should that

happen in this case; any such factor of the proposed transaction must be considered in the EIS process.

Second, the SDEIS must disclose whether the mineral rights underlying Tract 1 are reserved or outstanding. According to an earlier document in this process, 4,591 of 4,650 acres have private outstanding mineral ownership. This is simply not acceptable for the largest non-Federal parcel proposed in the exchange, regardless of whether the Forest Service believes there is a “low potential” for mineral extraction.

Furthermore, the SDEIS acknowledges the “potential for aggregate production from the northeastern corner of the tract along the Pike River.” More information is needed on what this means in regards to the outstanding mineral ownership. For instance, how much of the tract does “the northeastern corner” encompass? It is unclear from either the description of the tract or from state law whether aggregate would go with the surface estate or the mineral estate. According to a DNR fact sheet, the answer to this question is not uniform, but is based on the intent of the parties when the mineral rights were severed from the surface estate. Minnesota DNR Dept. of Lands and Minerals, “Mineral Rights Ownership In Minnesota,” (2000) (Ex. 82). Thus it appears that on some portion of the Hay Lake lands, the Forest Service may not have the authority to prevent the mineral owner from destroying the surface for aggregate production. Again, it is an unacceptable exchange if this is the case. The potential for aggregate production needs to be further explored and disclosed.

B. Tract 2 (Lake County Lands)

According to the SDEIS:

Tract 2 parcels are tax forfeit lands that are being purchased in the name of Lake-Forest Enterprise, Inc. on a land contract from Lake County. An assignment on file with Andresen and Butterworth, PA assigns all right, title, and interest in these lands to PolyMet (USFS 2011c).

A review of mineral resources on Tract 2 indicates a low potential for exploration or development of bedrock or surficial deposits (Barr 2011c). A title commitment review found that one 40-acre parcel has one-half mineral interest outstanding and that all other minerals will be reserved by the State of Minnesota and subject to the Secretary’s Rules and Regulations. Within the Lake County South parcel, one 40-acre parcel is subject to mineral reservation that includes the right to sink, cave, disturb, or remove surface material. Another parcel has one-half outstanding mineral interest with the right to remove but “doing no injury to the surface or else paying for damages.” The third and final 40-acre parcel and the remaining one-half mineral interest would be reserved by the State of Minnesota and would be subject to the Secretary’s Rules and Regulations (USFS 2011c).

SDEIS 4-396.

Here we have a parcel that apparently includes outstanding mineral rights that *explicitly* allows the owner to remove the surface. This cannot be considered a stronger title than the title to the Federal lands. The SDEIS points out that while the deed to Northanother parcel does not protect the surface, the mineral rights holder would be required to pay for damages. But this is no more than state law requires when the deed is silent on the subject of damages. *See* Ex. 82. Although the SDEIS seems to state that just one of the 40-acre parcels would not be subject to the Secretary of Agriculture's Rules and Regulations, it goes on to describe two parcels that are subject to language in the deeds that seem to allow strip mining. Apparently the mineral interest for one of these two parcels is held and will be held by the State of Minnesota, which is aggressive about leasing minerals and would no doubt fight for its lessee's right to strip mine if minerals were discovered. All of these factors weigh against a finding that exchange for this land well serves the public interest.

Also, we note that this land has recently been held by Lake County, and was apparently transferred from Lake County in anticipation of the proposed land exchange. It appears from the record that the Lake County lands were added after the first wetland analysis showed that the land exchange was lacking adequate wetland acres. *See* NorthMet Land Exchange Scoping documents-PolyMet Land Exchange Proposal Feasibility Analysis, Wetland, Lake Shoreline, Stream Frontage, and Floodplain Assessment for the Proposed Polymet Land Exchange (2009), accessed at http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/72870_FSPLT2_028155.pdf

If Lake County approved or entered into an agreement or contract with PolyMet (or with third parties with the knowledge that the purpose was to further the PolyMet project) to assist PolyMet's NorthMet project in the environmental review process, this agreement or contract violated state law restricting government action or approval prior to completion of the environmental review process.

Minnesota law requires that state agencies (including county governments) not take final action on a project prior to the completion of environmental review. Minn. Stat. § 116D.04(2b) and Minn. R. 4410.3100. Moreover, the law requires that an EIS be prepared early in the process and that the information and analysis developed in the EIS be used by the government to inform permitting or approval decisions related to the project or pieces of the project. Minn. Stat. § 116D.04(2a). The language regarding consideration of the EIS information is mandatory: The government action shall be preceded by a detailed environmental impact statement. The statute does not except preliminary or minor pieces of a larger project. Further, government action is broadly defined in the law as activities, including projects solely or partially conducted, permitted, assisted, financed, regulated or approved by a unit of government, and units of governments include all levels of government. Minn. Stat. § 116B.04(1). The point of these provisions as read together is to ensure that environmental review occurs before government decisions on both the primary action and any related or connected actions are

made. If the chipping away of pieces of the project is allowed while environmental review is pending, this frustrates the purpose and intent of the law.

This appears to be similar to an earlier attempt to secure wetland mitigation acreage for the PolyMet project without environmental review. St. Louis County entered into a Wetland Restoration Agreement with PolyMet dated February 7, 2006 and was subsequently sued in Minnesota District Court. The Court ruled in favor of the plaintiff, Wetlands Action Group. Further, the court held that a contract is the same as a permit for purposes of MEPA, and proceeded to void the agreement and associated actions as a violation Minnesota Rule 4410.3100. See Wetlands Action Group, et al., Plaintiffs vs. St. Louis County, et al., Defendants April 17th, 2007, Ex. 84. In considering the Land Exchange Proposed Action, the USFS must address whether the Lake County Lands were acquired in violation of Minnesota law and if so, remove them from consideration in the proposed land exchange.

C. Tract 3 (Wolf Lands)

According to the SDEIS:

Tract 3 is being purchased in the name of Lake-Forest Enterprise, Inc., through options from Wolf Lands, Inc. An assignment on file with Andresen and Butterworth, PA assigns all right, title and interest in these lands to PolyMet (USFS 2011c).

There appears to be low potential for exploration or development of bedrock or surficial deposits on the Wolf Lands parcels. There is a *moderate potential* for aggregate development within Wolf Lands 2, but the parcel's wetland areas and limited access may restrict this opportunity (Barr 2011c).

Within Wolf Lands 1 there is an undivided three-quarter mineral interest reserved by Anton T. Anderson; all remaining mineral interests are held by Kimberly Clark with the right to *cave, disturb, damage, or remove the surface* while accepting liability for surface damage. The title commitment review indicated that this represents a *poor condition of title* but may be immaterial because the mineral development potential is low. In addition, there is no timber reservation or agreement in place (USFS 2011c).

Within Wolf Lands 2, 3, and 4, mineral interests are reserved by Duluth & Iron Range Railroad Co. along with the right to *sink, cave, disturb, and remove the surface*. The title commitment review indicated that this represents a *poor condition* of title that may be immaterial because the mineral development potential is low.

Within Wolf Lands 3, Stora Ernsø North America Corporation has reserved timber rights pursuant to a timber agreement in its deed to Wolflands Corporation. The timber reservation expires December 31, 2013. The timber reservation

applies to Sections 8 and 17, T59N, R9W (two 40-acre parcels) (USFS 2011c). There are no timber reservations or agreements in place for Wolf Lands 1, 2, or 4.

SDEIS 4-401. Thus this entire tract is subject to deed provisions that allow destruction of the surface by the mineral estate holder.

The disclosure that “the title commitment review indicated that this represents a poor condition of title” is interesting, as the title condition is now considered “moderate.” SDEIS Table 5.3.1-3. This statement provides no citation, and we were unable to find a “title commitment review” document in the SDEIS references. The Forest Service must disclose this document and explain why the title ratings have been upgraded. We suspect that a similar situation applies to other tracts; if so, this information must also be disclosed.

Regarding Wolf Lands 2, the SDEIS states that there is moderate potential for aggregate mining but that “the parcel’s wetland areas and limited access may restrict this opportunity (Barr 2011c).” SDEIS 4-401 (emphasis added). We reiterate our observations for the Hay Lake lands on this point, and add that the right to “remove the surface” could very well be interpreted by a court to mean that the aggregate resources belong to the mineral estate. Furthermore, we note that if this is so, the current case is more than enough evidence that the presence of wetlands and limited access will not restrict access to mineral resources if there is money to be made. In summary, the acceptance of this land in exchange for the Federal lands does not well serve the public interest.

D. Tract 4 – Hunting Club Lands

Regarding the “property rights, title, and mineral resources” of Tract 4, the SDEIS states,

There is low potential for exploration or development of bedrock or surficial deposits within Tract 4 (Barr 2011c). Definitive information about mineral ownership and expiration of the Sustainable Forest Incentive Act covenant (dated 2002) for this tract will be provided in the Final EIS.

SDEIS 4-402. There is not enough information to provide informed comments at this time regarding the Tract 4 and the public interest review. It is frustrating to find important pieces of information withheld until the Final EIS. The Forest Service must have all of the pertinent information in front of it before it makes a decision, and informed input from the public is an important component of that decision making process. See *Robertson v. Methow Valley Citizens*, 490 U.S. 332, 349 (1989); *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 371 (1989). Future stages of this process must provide all of the missing information to the public with sufficient time for review before governmental decisions are made.

E. Tract 5 – McFarland Lake Lands

Regarding the “property rights, title, and mineral resources” of Tract 5, the SDEIS states,

PolyMet is the owner of surface rights for this tract. The tract is subject to a mortgage in favor of Iron Range Resources, which would be satisfied at closing of the Land Exchange Proposed Action (USFS 2011c).

The tract was assessed for mineral potential and encumbrances as part of the Feasibility Analysis completed in 2009. The geology underlying the tract is gabbroic and sedimentary rocks. Studies of the mineral potential in this area are rare because of the proximity to the BWCAW, but this type of formation has not shown mineral potential elsewhere in the county. The MDNR core library index shows no drilling in or near the area. There are no nearby gravel operations that would indicate any potential for surficial materials (USFS 2009c).

There appears to be low potential for exploration or development of bedrock or surficial deposits within Tract 5 (Barr 2011c). Mineral rights to Tract 5 are outstanding, but deeds do not appear to waive the right to subjacent support (USFS 2011c) (i.e., mineral exploration and extraction may not compromise the “lay of the land” by weakening underground support of the surface).

SDEIS 4-402 – 4-403.

As with the Hay Lake Lands, the Forest Service must disclose how PolyMet plans to satisfy this mortgage in favor of Iron Range Resources at closing. Under no circumstances should the Forest Service allow PolyMet to reserve timber rights through the exchange as part of its plan to satisfy the mortgage.

It is ironic that the SDEIS points out that the deeds “do not appear to waive the right to subjacent support.” If the Forest Service is unwilling to rely on and defend its rights under similar provisions in the title to the Federal lands, of what value are the provisions of this deed?

In summary regarding all of the tracts, the outcome of this transaction would be to decrease protection across the forest landscape (under all types of ownership) from the ravages of strip mining. Relatively few of the parcels will be subject to the restrictions that are present in the Federal land, and the restrictions on the Federal parcel will be lost. Few of the non-federal parcels will have restrictions added to the current deed; most of the land will be no more protected from strip mining under Forest Service ownership than it is under private or state ownership. This loss of protection of surface property and all of the benefits it provides to humans and other species does not well serve the public interest.

e. Expansion of Communities

According to the SDEIS, the construction phase is expected to cause “relatively few” employees to “permanently relocate to the study area, due to the short-term and transient nature of mine construction.” SDEIS 5-504. During the operations phase, there would be “adequate housing to accommodate the influx of workers” due to the “small number of new residents[.]” SDEIS 5-505. Therefore, the proposed land exchange is not needed for an expansion of communities.

f. Promotion of Multiple-Use Values

The proposed land exchange does not promote multiple-use values. Rather, it promotes the single value of mining. The lands that would be acquired will not change from their current use as forested property, and none of them seem to be under any threat of conversion to other uses.

Furthermore, the consideration of multiple uses has to be informed by the state or the forest as a whole. The Federal land is very valuable for wetland, wildlife, and water quality purposes. Judging the property as contributing less to multiple-use values than other tracts based on such things as lack of public access would be much like judging the importance of a tract to preservation of biodiversity based on the number of species present, without regard to how common those species are or the value of the ecosystem to biodiversity on a landscape scale.

Most disturbing is the fact that these Federal lands were acquired pursuant to the Weeks Act for national forest purposes, including watershed protection, and this project will inevitably result in significant degradation of streams and watersheds. For instance, the upper reaches of the Partridge River currently flow through Forest Service land, and this river has thus been the beneficiary of Weeks Act protection. The Land Exchange Proposed Action would remove that protection at the time when the river needs it the most. In fact, this entire situation calls the purposes of the Weeks Act into question. What does it mean to protect watersheds and forest production if the lands are disposed of as soon as they are threatened?

The SDEIS admits,

After the implementation of mitigation measures that have been built into the design, the NorthMet Project Proposed Action would have unavoidable adverse effects on wetlands, vegetation, wildlife, air quality, noise and vibration, visual resources, cultural resources, water resources, and aquatic species.

SDEIS 7-12. This list includes many of the multiple use values that the Forest Service is required to promote. In addition, we note that the net availability of timber (across all ownerships) will be reduced, and we are convinced that the net impact on economics will be negative as well.

The proposed land exchange, with its substantial and long-lasting “unavoidable adverse effects” on a long list of resources cannot possibly be found to promote multiple-use values or well serve the public interest.

g. Forest Plan Implementation

The SDEIS relies on the land acquisition provisions of the Forest Management Plan as a basis for the various aspects of the Land Exchange Proposed Action. SDEIS at 3-157. In addition, several other desired outcomes and management objectives apply.

i. Conveyance of Land

According to the SDEIS, the Federal land is “potentially available for conveyance” because it meets the criteria of G-LA-3. That criteria identifies the following land as suitable for conveyance:

- (a) Land inside or adjacent to communities or intensively developed private land, and chiefly valuable for non-National Forest System purposes.
- (c) Inaccessible parcels isolated from other National Forest System land and intermingled with private land.
- (d) Parcels that would reduce the need for landline maintenance and corner monumentation, result in more logical and efficient management, and improve land ownership pattern.
- (e) Tracts that would be difficult or expensive to manage due to ROW problems, complex special use permits, or tracts with significant property boundary issues.

USFS 2004b. We disagree that the Federal land meets this criteria. This is a large, solid block of property with only two small inholdings. It is adjacent to other Forest Service lands on two boundaries, and the exchange of this property would actually increase fragmentation of other adjacent national forest land in the south west corner. Although a portion of the property is adjacent to a mine site, *that would be equally true of another parcel of property after the NorthMet mine is built*. Other than its location near Northshore Mining, the land is not surrounded by other intensively developed private land. The road and railroad that pass through the area do not amount to intensive development. The land is most certainly not “chiefly valuable for non-National Forest System purposes.” If it were not for the PolyMet proposal, the Forest Service would not dream of calling this land “not valuable for National Forest System purposes.” The land was identified as appropriate for an RNA site, and has been recognized by everyone involved as a very high quality, important ecosystem and wetland area.

The difficulty with trying to fit this parcel into the regulatory criteria is that it is located in an area with significant other National Forest property. Although there is mixed ownership, it is not greater than over most of the Superior National Forest outside

of the BWCAW. The Forest Service can describe this land as “difficult or expensive to manage due to ROW problems,” (for example), but right-of-way issues will remain for other property in the area after this property is disposed of. If this property is looked at in isolation, it might seem that land ownership patterns would be improved, but when the totality of national forest lands in the vicinity are assessed together, disposing of this land does not make sense. The Forest Service is attempting to shoehorn the property into management objectives that were meant to be used to *identify* lands that would be appropriate to trade. The use of those objectives to *justify* a trade that has been identified for purposes that are not included in the criteria (i.e. to benefit a private corporation) is an exercise doomed to failure. To put this another way, “Land that is desired by a private corporation for development” is not included on the list.

ii. Acquisition of Land

G-LA-2 applies to the acquisition of land, and sets the following priorities:

Priority 1 (a, b, and c are not listed in order of importance)

1(a) Land needed for habitat for federally listed endangered, threatened, proposed, or candidate species or for Regional Forester sensitive species.

1(b) Land needed to protect significant historical and cultural resources, when these resources are threatened or when management may be enhanced by public ownership.

1(c) Land needed to protect and manage administrative or Congressionally designated, unique, proposed, or recommended areas.

Priority 2 (a thru f are not listed in order of importance)

Key tracts that will promote more effective management and will meet specific needs for management, such as:

2 (a) Land that enhances recreation opportunities, public access, and aesthetic values.

2 (b) Land needed to enhance or promote watershed restoration or watershed improvements that affect the management of NFS land riparian areas.

2 (c) Environmentally sensitive and/or ecologically rare lands and habitats.

2 (d) Wetlands.

2 (e) Land and associated riparian ecosystems on water frontage such as lakes and major streams.

2 (f) Land needed to achieve ownership patterns that would lower resource management costs.

Priority 3

3 (a) All other land desirable for inclusion in the National Forest System.

USFS 2004b.

The SDEIS applies the criteria of G-LA-2 to some of the lands that would be acquired. While the non-federal lands may meet the criteria, the difficulty is that *they do not meet the criteria as well as does the land that is being given up*. The federal land that

is being given up is designated critical habitat that will be destroyed if it is exchanged. As such, the proposed land exchange would result in a detriment to the one of the top priority values expressed in the management objectives for acquiring land. The objective of protecting significant historical and cultural resources is similar. The SDEIS does not say why the Hay Lake lands meet the 1(b) criteria, but it appears that it is due to the presence of wild rice. Yet the land exchange would facilitate the ongoing, enormous destruction of wild rice due to sulfate pollution from mining throughout the St. Louis River watershed. Furthermore, the Federal land is in fact “needed to protect significant historical and cultural resources, when these resources are threatened.” Rather than supporting the disposal of this land, the Forest Plan management objectives say that this would be good land to obtain if the Forest Service didn’t already own it!

Many of the criteria under Priority 2 also apply more strongly to the federal than the non-federal lands. In particular, this land is environmentally sensitive and ecologically rare, and the wetlands are very valuable. In general, while the non-Federal lands may be wonderful properties that the Forest Service would be happy to have, that does not alter the fact that the Federal land is also a wonderful property that the Forest Service was happy to have up until now. This criteria may be appropriate to use strictly for the purpose of deciding whether the non-Federal lands would be acceptable, but that should not be allowed to spill over onto the question of whether the Federal lands are appropriate to dispose of in the first place.

iii. Mining

Forest Plan D-MN-2 states the objective:

Ensure that exploring, developing, and producing mineral resources are conducted in an *environmentally sound manner* so that they may contribute to economic growth and national defense.

USFS 2004b at 2-9 (emphasis added).

The SDEIS makes clear that PolyMet’s proposed open pit mine will not be constructed, operated, and closed “in an environmentally sound manner.” The project would have immediate impacts on water quality, and would further threaten water quality for hundreds of years. The project would destroy more than 1,000 acres of wetlands, many of which are considered of pre-European condition and which the EPA has recognized as aquatic resources of national importance. Most of this destruction would be “mitigated” outside of the St. Louis River watershed, so that the lost functions will not in fact be replaced. The project would add to intractable mercury and sulfate pollution problems, which are already having a devastating impact on fetal health and wild resources. The project would destroy more than two square miles of the designated critical habitat of a threatened species, which is also habitat for many other species of concern. This is only a portion of the long list of environmental impacts discussed above in these comments.

While the project would temporarily contribute to the local economy, experience and history indicates that this will not amount to “economic growth” over the long term. Moreover, there is no evidence that the proposed mine would contribute to national defense. In fact, the SDEIS suggests that the minerals from the mine will be exported. SDEIS 1-11. Far from implementing D-MN-2, the Land Exchange Proposed Action would violate it, as this management objective directs the Forest Service not to promote mining, but to ensure that it is conducted in an environmentally sound manner.

iv. Air Quality Desired Conditions

The Forest Plan includes many other provisions that the SDEIS completely ignores. A few of these are mentioned here; the entire list is too lengthy to include.

Two of the three Forest Plan desired conditions for air quality apply to this situation. D-AQ-1 states:

Air on the Forest is of high quality so that:

- Ecosystems are not impaired by stressors originating in the air (for example, acid deposition, direct injury to vegetation by air pollutants, detrimental changes to soil chemistry and mercury contamination of fish).
- The health of visitors, residents, and employees is not impaired.
- Visibility does not impair scenic quality.
- Other air quality related values are not adversely affected

USFS 2004b. D-AQ-2 states: New and modified industrial facilities do not degrade Forest resources or uses. *Id.* As explained above in these comments, the Proposed Project would result in conditions that do not meet these goals. Facilitating the project’s air pollution by conducting a land exchange therefore does not comply with this aspect of the Forest Plan.

v. Watershed Provisions

Many of the watershed provisions in the Forest Plan dictate against facilitating the NorthMet project. They include:

D-WS-1 Watersheds and their components:

- a. Are part of healthy ecosystems that meet the needs of current and future generations
- b. Provide for State, tribal, and local beneficial uses
- c. Are protected or enhanced to provide for unique plant and animal communities, special habitat features, habitat linkages, wildlife corridors, aquatic ecosystems and riparian ecosystems.

D-WS-4 Management activities do not reduce existing quality of surface or groundwater or impair designated uses of surface and ground water.

D-WS-5 Water quality, altered stream flow, and channel stability do not limit aquatic biota or associated recreational uses. Water in lakes, streams, and wetlands meets or exceeds State water quality requirements.

D-WS-6 Watersheds provide an appropriate quantity, quality, and timing of water flow. Stream channels and lakeshores are stable. Stream temperatures are maintained within their natural range and are not increased by lack of shading or because of channel instability. Fine sediment from management activities does not adversely affect lake, stream, and wetland habitats. Macro-invertebrates are represented in the approximate proportion expected for high quality waters. Fish habitats are in good to excellent condition and are spatially distributed and connected to allow stable populations of fish, reptiles, and amphibians to persist within their natural ranges. Natural reproduction of fish is not limited by habitat condition.

D-WS-13 Floodplains have little or no new facility development. Floodplains are able to store and transmit floodwaters, fulfill their natural role in regulating water quality, and present minimum risk to human safety and property.

O-WS-1 Improve and protect watershed conditions to provide the water quality, water quantity, and soil productivity necessary to support ecological functions and intended beneficial water uses.

USFS 2004b.

In reviewing all of these goals and objectives, one is struck by the apparent disconnect between Forest Service values and its apparent direction in this case. The only explanation seems to be that the Forest Service cares only about the National Forest, and is simply not concerned with what would happen to the resources on the current Federal land or downstream if the land exchange and mine are approved. We believe that the Forest Service goals and objectives should be considered more broadly. For example, we think forest managers would agree that “Management activities do not reduce existing quality of surface or groundwater or impair designated uses of surface and ground water” would apply to activities that reduce downstream water quality, even if that water is beyond the boundary of the forest. Furthermore, the environmental degradation that is being considered is slated for what is currently Forest Service property. One would hope that the management goals and objectives do not fly out the window as soon as the Forest Service considers exchanging land. The Land Exchange Proposed Action would itself be a “Management Action” and as such should be undertaken only if it complies with and furthers the Forest Plan goals and objectives.

Finally, we note that the Forest Plan objective for Jack pine/black spruce forest is to restore it to historic levels, which involves a significant increase in acreage. Forest Plan 2-61. The Proposed Project would destroy 698 acres of this ecosystem, which would not be replaced by the non-Federal lands.

h. Fulfillment of public needs

The clear purpose of this land exchange is to fulfill the needs of a private corporation. Because that corporation is attempting to make its needs appear as public needs, the Forest Service and other Co-Lead agencies need to take a critical look at the purported public needs for this project.

The greatest public need here is the need for clean air, water, and land, intact forests and wetlands that provide habitat for threatened, endangered, and sensitive species, and a future that does not involve managing the waste of long-departed generations. While the NorthMet Project would temporarily increase employment by a minor amount, the net impact after twenty to thirty years is likely to be negative. As explained above, the record includes no factual material indicating that these metals are needed, as opposed to simply desired, and the better public policy would be *not* to increase the supply, as that will only fuel additional demand.

i. Violation of Other Federal Policies

In addition to those included above, the Land Exchange Proposed Action would not well serve the public interest because it is contrary to several additional federal policies. Exchanging this land would result in a project that would be counter to many important environmental objectives of the federal government. Most of these issues are discussed in more detail in other sections of these comments. They include:

- The mercury Zero Discharge goal for the Lake Superior basin;
- The “broader program” to restore and protect the Lake Superior basin;
- Efforts to reduce greenhouse gas emissions;
- Efforts to ensure that the federal and state governments (and taxpayers) are not left with clean-up costs for polluted mine sites;
- Protection of potable water and of drinking water wells;
- The reduction of haze in Class I areas.

There may be situations where particular federal agencies are not able to further federal goals with their more limited management directives, but this is not one of them. As explained above, the Forest Service does not need to resolve the divided surface and mineral estates involved in this situation. The deed provides the division of rights between the owners, and there is no need for the Forest Service to acquiesce to the demands of a private corporation to allow it to conduct an activity that runs counter to so many Forest Service and federal policies.

4. Summary – the Land Exchange Proposed Action Does Not Well Serve the Public Interest

As stated above, to determine whether “the public interest will be well served” by the proposed land exchange, the Forest Service must find that:

- The resource values and the public objectives served by the non-Federal lands or interest to be acquired must equal or exceed the resource values and the public objectives served by the Federal lands to be conveyed, and
- The intended use of the conveyed Federal land will not substantially conflict with established management objectives on adjacent Federal lands, including Indian Trust lands.

36 C.F.R. § 254.3(b)(2).

For all of the reasons described above and throughout these comments, the land to be acquired here does not equal *either* the resource values *or* the public objectives served by the lands to be conveyed. The Forest Service must thus decline the proposed land exchange.

E. Equal Value Documentation Must be Disclosed to the Public

The Federal Land Policy and Management Act (FLPMA) requires that:

the values of the lands exchanged...by the Secretary of Agriculture under applicable law relating to lands within the National Forest System either shall be equal, or if they are not equal, the values shall be equalized by the payment of money to the grantor or to the Secretary...as the circumstances require so long as the payment does not exceed 25 per centum of the total value of the lands or interests transferred out of Federal ownership.

43 U.S.C. § 1716(b). Forest Service regulations provide:

Except as provided in § 254.11 of this subpart, lands or interests to be exchanged must be of equal value or equalized in accordance with the methods set forth in § 254.12 of this subpart. An exchange of lands or interests shall be based on market value as determined by the Secretary through appraisal(s), through bargaining based on appraisal(s), through other acceptable and commonly recognized methods of determining market value, or through arbitration.

36 C.F.R. § 254.3(c).

The Forest Service must provide its assessment of the properties at issue here, so the public can determine whether these provisions have been met. According to Forest Service regulation, “the findings and the supporting rationale [for a land exchange] shall be documented and made part of the administrative record.” 36 C.F.R. § 254.3(b)(3).

The appraisal is an absolutely essential “supporting rationale” for the proposed land exchange; the exchange could not go forward without documentation as to value in the record, and cannot go forward if the exchange is not equal. The Forest Service must provide this information with sufficient time for the public to review it before making a decision.

F. The Range of Alternatives to the Land Exchange is Too Narrow

The alternatives section “is the heart of the environmental impact statement.” 40 C.F.R. § 1502.14. The purpose of analyzing alternatives is to “sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decisionmaker and the public.” *Id.* The Co-Lead Agencies must “rigorously explore and objectively evaluate all reasonable alternatives.” *Id.* at § 1502.14(a). The Co-Lead Agencies must also “include reasonable alternatives not within the jurisdiction of the lead agency.” *Id.* at § 1502.14(c).

The Forest Service considered just two alternatives to the Land Exchange Proposed Action. The first, the “no action” alternative, is required by 40 C.F.R. § 1502.14(d). The second, Alternative B, “was derived from the Mine Site Exchange Only Alternative” developed during scoping and “would convey fewer acres of federal land for fewer acres of non-federal land.” SDEIS 3-166.

In other words, other than the Land Exchange Proposed Action, the Forest Service considered only the no-action alternative required by regulation and an alternative that differs from the Proposed Action only in that it involves fewer acres. This does not satisfy the Forest Service’s obligation to “rigorously explore and objectively evaluate all reasonable alternatives,” including “reasonable alternatives not within the jurisdiction of the lead agency.” The Forest Service must consider additional alternatives that have either been eliminated from further consideration or have not been considered at all.

According to the SDEIS, six additional alternatives were initially considered but were eliminated from detailed analysis “because the proposals could not be acted upon at this time, were represented in the alternatives analyzed in detail, or did not meet the Purpose and Need.” SDEIS 3-173. Those alternatives detailed included: 1) direct purchase of the non-federal parcels; 2) acquisition of a single contiguous non-federal parcel; 3) exchange of federal lands for multiple non-federal parcels that have wetlands and habitat more similar to the federal lands than the proposed non-federal lands; 4) mine site exchange only; 5) full exchange with restrictions; and 6) underground mining alternative.

The Forest Service should not have eliminated all of these alternatives from detailed analysis, particularly the “full exchange with restrictions” and the “underground mining” alternatives. In addition, rather than considering the purchase of the non-Federal parcels, which does not meet the purported purpose of the project, the Forest Service must consider purchase of the mineral rights on the Federal parcel, which would meet the purported purpose far more than does the Proposed Action. The lack of alternatives

regarding alternative mining methods is an earlier section of these comments, and includes the Underground Mining Alternative. It also explains the problem of defining the Purpose and Need too narrowly, which applies equally to land exchange alternatives. Alternatives specific to the Land Exchange Proposed Action are addressed below.

1. The Forest Service Should Assess a Full Exchange With Restrictions Alternative

The SDEIS provides very little information about this suggested alternative, other than to state that it “is not substantially different from Alternative B, where the smaller federal parcel exchange would be protective of the One Hundred Mile Swamp.” However, Alternative B is not protective of the One Hundred Mile Swamp. The SDEIS does not provide a delineation of the One Hundred Mile Swamp, particularly not one with an overlay of the two Land Exchange alternatives. However, very little of the swamp is located in the additional land that is included in the Proposed Action as opposed to Alternative B. See SDEIS Figure 3.3-2.

The Forest Service could perhaps think more creatively about restrictions and requirements that could be placed on mining to ameliorate some of the impacts. The restrictions would not have to apply only to land that will not be impacted by mining. For instance, the inclusion of reverse osmosis treatment at the Mine Site from start-up, with immediate discharge within the Partridge River watershed might mitigate some of the impacts on wetlands and the Partridge River. As the holder of property rights that PolyMet must obtain in order to build a surface mine, the Forest Service has a significant amount of leverage that it could use to reduce the environmental impacts of this project. NEPA requires it to take a hard look at using that leverage.

2. The Forest Service Should Assess an Alternative That Does Not Sacrifice the Partridge River

One of the most disturbing things about the Land Exchange Proposed Action is that the lines have been drawn so that the Forest Service no longer owns riparian land along that portion of the Partridge River that is most likely to be affected by the proposed mine. The eastern “Mine Site” boundary does not extend to the river, but the land exchange proposal was structured to remove that stretch of the river from federal control. Land was also added to the Mine Site boundary south of the railroad track to the same effect – removing riparian land from federal control. See Figure 3.3-2. It is difficult to imagine that this was not deliberate, and we suspect that the reason is that the Forest Service did not want the headache of administering a polluted, degraded river. The SDEIS needs to include information about how the boundaries were drawn and why, and an explanation of the rationale for giving up these riparian lands.

Given the purpose for which this land was acquired and the emphasis the Forest Service puts on protecting riparian lands, it is extremely disheartening that the Forest Service proposes to wash its hands of this river, just when the river most needs monitoring, oversight, and protection. As discussed above, this stretch of the river has

been ignored in the modeling, and is likely to experience water quality standard violations and drawdown of water levels. Putting the riparian lands in the mine owner's hands is not likely to result in stewardship to prevent or address these impacts, and in fact the sketchy monitoring plan included in the SDEIS does not include monitoring of this stretch of the river.

The difference in acreage between the Proposed Action and a Partridge River Alternative is not large, but it could make a significant difference to the river. The Forest Service should consider an alternative that leaves Partridge River riparian lands in federal ownership.

Finally, it is particularly troublesome that the Forest Service is exchanging some of its acreage specifically to accommodate PolyMet's emissions. SDEIS at 3-173. One has to wonder whether the Forest Service would be giving up additional land if PolyMet was seeking higher emission limits. It is unclear what boundaries were changed on this basis, but it is particularly objectionable if the additional land includes the Partridge River, which will undoubtedly experience degradation from the deposition of air pollutants, an impact that is completely ignored in the SDEIS. At any rate, the policy of exchanging as much land as a polluter requires to attain ambient air quality standards at the property line surely does not well serve the public interest.

3. The Forest Service Should Consider Acquiring the Mineral Rights for the Federal Land Through LWCF Appropriations.

The Forest Service must consider an alternative that seeks appropriations from the Land and Water Conservation Fund (LWCF) to acquire the mineral rights underlying the Federal lands in the Land Exchange Proposed Action. This is the one alternative that would actually meet the purported purpose of this project, but was never considered.

In *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800 (9th Cir. 1999), the Ninth Circuit stated that:

The plaintiffs also argue that the land could have been purchased outright with funds from the Federal Land and Water Conservation Fund. While the Forest Service itself cannot appropriate these funds, it can request them. The record reflects that such a request was never made, and indeed, this option was not even considered.

The appellees respond that, because it was not clear that the funds would be available for such a purchase, the Forest Service had no obligation to consider it, as it constituted a "remote and speculative" alternative. *Vermont Yankee*, 435 U.S. at 551, 98 S.Ct. 1197. However, NEPA regulations state that agencies shall "include reasonable alternatives not within the jurisdiction of the lead agency." 40 C.F.R. § 1502.14(c). *This alternative clearly falls within the range of such reasonable alternatives, and should have been considered.* We also note that in presenting the beneficial cumulative impacts of the exchange, the EIS frequently

relies upon references to admittedly speculative funds that will be used by the Forest Service in restoring the forest lands that it gains through the transaction. We are troubled by this selective willingness to rely upon the availability of funding sources beyond the Forest Service's direct control.

The Forest Service also contends that because the purpose of the transaction was to carry out an "exchange" and not a purchase, it was not required to consider this alternative. *Seattle Audubon Society*, 80 F.3d at 1404) (holding that an agency is not required to examine alternatives inconsistent with its basic policy objectives). To the extent that Weyerhaeuser would have been exchanging its lands for federal monies rather than federal lands, we do not recognize such an inconsistency.

Muckleshoot Indian Tribe v. U.S. Forest Service, 177 F.3d 800, 814 (9th Cir. 1999) (emphasis added).

The same principle should apply here. The Forest Service is authorized to acquire "interests in land or waters" with monies from the Land and Water Conservation Fund. 16 U.S.C. § 460l-9(a)(1). The Forest Service promotes using the Land and Water Conservation Fund to "provide recreational opportunities, provide clean water, preserve wildlife habitat, enhance scenic vistas, protect archaeological and historical areas, and maintain the pristine nature of wilderness areas." U.S. Forest Service, Lands and Realty Management, LWCF Purchases, <http://www.fs.fed.us/land/staff/LWCF/>. Many of these values would be protected through acquisition of the mineral estate in this case. Therefore, the Forest Service must consider this alternative.

IV. The Project Would Result in Significant, Unacceptable Impacts, and Should Not Be Permitted

All three of the Co-Lead agencies are directed by their applicable laws and regulations to take account of significant environmental effects when deciding whether to authorize the activities proposed for the NorthMet project. Environmental review is not an exercise with no ultimate impact on decision making. The Army Corps of Engineers must undertake a "public interest review" of the Section 404 Wetlands Fill permit application; that review explicitly involves weighing the "benefits which reasonably may be expected to accrue from the proposal . . . against its reasonably foreseeable detriments." 33 C.F.R. § 320.4(a)(1). The proposed land exchange is governed in part by the Federal Land Policy and Management Act, which allows land exchanges if certain requirements are met, including that the public interest is "well-served" by the exchange. 43 U.S.C. § 1716(a). Both public interest reviews include considering the effect of the proposal on the environment.

Under state law, the DNR may not grant a permit if permitted activities are

likely to cause pollution, impairment, or destruction of the air, water, land or other natural resources located within the state, so long as there is a feasible and prudent alternative consistent with the reasonable requirements of the public

health, safety, and welfare and the state's paramount concern for the protection of its air, water, land and other natural resources from pollution, impairment, or destruction. Economic considerations alone shall not justify such conduct.

Minn. Stat. § 116D.04(6). Under this statutory requirement, the DNR must deny the permits required for this project if the environmental consequences outweigh the benefits. *See Minnesota Public Interest Research Group v. White Bear Rod and Gun Club*, 257 N.W.2d 762 (Minn. 1977).

Thus even if all other legal requirements are met, the three Co-Lead agencies must still consider whether harm to the environment outweighs the benefits of the project. For reasons discussed throughout these comments and briefly delineated below, the Co-Lead agencies should deny their respective authorizations due to the unacceptable environmental impacts of this project.

A. *The Creation of a Hazardous Waste Site that Will Need to Be Managed For Centuries Is Unacceptable*

Perhaps more than any other factor relating to this project, Minnesotans are profoundly uncomfortable with the idea of creating a situation where contaminated water will need to be treated for centuries, with no predictable end date. Any benefits of the mine would accrue during a twenty-year period, with the detriments extending more than five hundred years into the future. Creating this kind of liability for future generations has serious moral implications, and the agencies simply should not countenance it.

While financial assurance information should have been provided in the SDEIS, it is also the case that financial assurance cannot take care of this issue. The agencies have no basis to believe that any financial instrument, including cash, would remain viable for hundreds of years. They have not named or described an instrument that has *ever* maintained its value over more than five hundred years. Ignoring the entire course of history in the greed for short-term benefits is foolhardy and selfish.

The consequences of the necessary water collection and treatment system ending prematurely could be enormous. Contamination of fish due to mercury and other metals, the further destruction of wild rice stands due to sulfates, and the contamination of Hoyt Lakes water supply are just a few of the threats if an economic depression, war, or simple human negligence were to cause a disruption in the water treatment systems. The likelihood that none of these things would occur over more than five hundred years is virtually nil.

B. *The Amount of Predicted Greenhouse Gas Emissions is Unacceptable.*

Global climate change has already proven to be the largest cause of destruction of human life, wildlife, ecosystems, and vital natural resources to arise from human technology, and we have barely begun to see the impacts. It is absolutely imperative that

we stop conducting “business as usual” and start making decisions that will cumulatively result in drastically lowered carbon emission levels.

This project would significantly increase greenhouse gas emissions. This factor alone should be the end of any consideration of permitting it. Especially when compared to the benefits to be gained, this increase in greenhouse gas emissions is simply unacceptable.

C. *The Project Would Have Unacceptable Impacts on Wetlands*

The amount of wetland acreage that would be destroyed by the Proposed Project, both through direct destruction and indirectly due to groundwater drawdown and other factors, is staggering. The size of the area of impact is so large that the impacts cannot be mitigated within the Partridge and Embarrass River watersheds. As proposed, the planned mitigation is not even within the St. Louis River watershed or the Lake Superior basin.

Furthermore, these wetlands are of very high quality, described in places as of “pre-European condition.” They store an enormous amount of carbon that will be released to the atmosphere when disturbed, contributing to global climate change. They provide a host of other functions that will not be replaced once they are destroyed. The permitting of this project would violate the federal and state goals of no net loss in wetland acreage and function.

D. *The Impacts of Mercury and Sulfate Pollution Would Be Unacceptable*

The Minnesota Lake Superior basin community is in the midst of a public health crisis that we cannot ignore. One out of ten infants is born with mercury levels in her blood at a level that can affect neurological development. This is heartbreaking for affected families and individuals, and is also an issue that will affect schools, government, and society on almost every level for decades to come.

Although science is still struggling to catch up, we already know that the mix of mercury and sulfates in wetland environments results in unsafe mercury levels in downstream fish. *This is precisely the situation that the agencies propose to permit for the NorthMet mine.* The SDEIS predicts no additional load of mercury to the Partridge and St. Louis Rivers originating from NorthMet waste rock and ore and entering the river through water discharges. However, deposition from air emissions, transport through groundwater, and polluted water used to augment stream flows were not included in the analysis. Both mercury and sulfate levels will increase in the area wetlands, and this is where the greatest potential for harm exists. Furthermore, the increased load of mercury to the Embarrass River is strictly prohibited under the Clean Water Act.

The agencies should honor the commitments the various governments around Lake Superior made to the people of the Lake Superior basin, and deny authorizations based on the failure to meet the Zero Discharge goals of the Binational Program to Restore and Protect Lake Superior.

E. The Proposed Project Would Have Unacceptable Impacts on Wildlife

The Mine Site proposed for destruction is a large, unfragmented tract of land with high quality wetlands and forest ecosystems, recognized as an area of High Biodiversity Significance and relatively undisturbed by human activity. The land belongs to the federal government and is part of the Superior National Forest. In short, it is prime wildlife habitat.

The land that would be destroyed is designated critical habitat for the threatened Canada lynx. It also provides excellent habitat for moose, which is listed by the state as of “special concern” and which is expected to disappear from the state of Minnesota within the next ten years if we do not do what is necessary to stop its precipitous decline. In addition, the area provides habitat for an untold number of species of mammals, birds, and other wildlife. In addition to outright destruction of two square miles of high quality habitat, the project would contribute to the cumulative blockage of most of the remaining corridors left to wildlife for migration from north to south of the Mesabi Iron Range. The destruction of this much habitat for such temporary benefits would be foolish and short-sighted, in addition to violating the Endangered Species Act.

F. The Impacts on Important and/or Rare Ecosystems and Plant Communities are Unacceptable

Among other things, the Proposed Project would destroy 1,718 acres of ecosystems rated of High Biological Diversity, 698 acres of an ecosystem type that is considered imperiled or vulnerable in the state of Minnesota, and one of only twelve known Minnesota populations of the floating marsh marigold, which is listed as endangered at the state level. One has to wonder why the government undertakes these assessments and ratings if it is not going to take account of them when a project like this is considered.

We are losing biodiversity, species, and ecosystems at an alarming rate due to global warming and other factors. In light of all of the diffuse and difficult-to-address sources of impact and stress on these plants and communities, permitting the destruction of this much important biota in one fell swoop would be foolish in the extreme. It is long past time to begin making decisions that contribute to the preservation rather than destruction of the biodiversity of Minnesota, the United States, and the planet.

G. The Proposed Project Would Have Unacceptable Impacts on Rivers and Streams That Are Already Impaired

A number of rivers and streams in the Proposed Project area are already either on the Impaired Waters list, or have mercury levels above the water quality standard and thus are impaired in fact. Some of the listings are for mercury, while others are for fishes bioassessments. The latter do not have identified stressors, but are listed based on monitoring of the fish community. Under the Clean Water Act, “Total Maximum Daily

Loads” must be determined, and a plan for reducing inputs to that load must be produced, before any additional discharges of pollutants may be permitted.

Rather than permitting hydrological changes and the addition of pollutant stressors (which could include air deposition as well as discharges) to an already impaired system, the agencies should be identifying stressors and addressing already existing sources of impairments. Permitting this project would fly in the face of the wisdom that underlies the Clean Water Act in regard to impaired waters.

H. The Acceptability of Impacts on Tribal Historical and Cultural Resources and Treaty-Protected Natural Resources Should be Determined by the Tribes

The Mine Site is part of the Superior National Forest, which is open to tribal members for exercise of their treaty rights. The Co-Lead Agencies apparently believe that land is fungible for this purpose; replace it with access to other lands, and there has been no loss. This rationale follows the patronizing attitude of this country’s past, which has been devastating to native culture and interests. We suggest that it is the place of the Tribes – not the Co-Lead agencies – to determine whether the exchange of lands is acceptable in regards to the exercise of treaty rights. If in the Tribes’ judgment it is not, the land should not be traded to a private entity.

The Proposed Project would also impact historical and cultural resources that are important to the Ojibway Tribes and people of this region. This alone should convince the agencies to refuse to allow PolyMet to strip mine this land. Haven’t people of European descent destroyed enough of native people’s resources at this point? The Superior National Forest Plan instructs forest managers to *purchase* property that contains tribal cultural resources that are threatened with destruction. The Forest Service needs to stand by its intentions and principles rather than caving in when a situation arises where tribal historical and cultural resources are threatened by politically powerful interests.

I. The Risk of Accidents and Spills of Hazardous Substances is Unacceptable

As with most of the SDEIS, the discussion of hazardous substances and accidents seems designed more to downplay the risk of accidents than to disclose them. A table with accident rates is presented and applied to two hazardous materials for transport over the distance from Duluth to the NorthMet site. The probability of a spill (not an accident, but an accident that results in a release to the environment) is calculated as about 29%. This is deemed to be a “low” probability. SDEIS 5-537. The text admits that “the odds of a potential release of hazardous materials during a transportation accident would incrementally increase if the [shipments of other hazardous materials] were included.” In fact, the odds double if truck shipments of all hazardous materials are included.

Thus we have a greater than fifty percent chance of a spill of hazardous material *just in the area between Duluth and the NorthMet site*. Given the accidents and spills that have been in the news lately, this is a potential of great concern. Furthermore, most of

these materials are not produced in Duluth. They will most likely be coming from a much greater distance, with the correspondingly greater probability of accidents and spills. Whether they come by boat, rail, or truck, it appears virtually certain that a release of hazardous material to the environment due to an accident will be one of the impacts of this project if it is approved. Given the enormous impacts of many of these accidents, this risk is unacceptable.

J. Any Economic Benefit of the Project Would Be Short-Lived, and Is Not Worth the Costs

The long-term economic impact of the Proposed Project would likely be negative rather than positive. Research shows that communities that pursue mining for economic development forego other more stable industries as a result, and in the end are left in a worse position economically than before the mine opened. Added to that is the instability caused by an industry that is governed by commodity prices that fluctuate to the point where production is periodically halted, and the certainty that at some point in the not-so-distant future the mining jobs will end, and the sum result is not positive. The local desire for a number of jobs that is insignificant in terms of the overall economy should not be given more consideration than either the long-term detriment to the economy or the many resources that would be destroyed or otherwise impacted by the project.

The above discussion should not be taken as a comprehensive list of all of the unacceptable impacts of the Proposed Project. However, this list is more than sufficient to explain why permitting this project would not be in the public interest.