GREAT LAKES INDIAN FISH AND WILDLIFE COMMISSION

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• MEMBER TRIBES •

MICHIGAN	WISCONSIN		MINNESOTA
Bay Mills Community	Bad River Band	Red Cliff Band	Fond du Lac Band
Keweenaw Bay Community	Lac Courte Oreilles Band	St. Croix Chippewa	Mille Lacs Band
Lac Vieux Desert Band	Lac du Flambeau Band	Sokaogon Chippewa	

Via Electronic Mail October 20, 2015

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Re: Discharge from PolyMet east pit at closure greater than previously reported

NorthMet EIS Co-lead Agency Project Managers:

Following up on discussions of closure and post-closure discharge from the PolyMet mine pits, GLIFWC staff have conducted water budget analysis that indicates that east pit discharge is likely to be approximately an order of magnitude greater than reported in the pFEIS.

GLIFWC is acting in coordination with our member tribes, including the Fond du Lac Band, to review and contribute to the PolyMet EIS process. As you may know, GLIFWC is an organization exercising delegated authority from 11 federally recognized Ojibwe (or Chippewa) tribes in Wisconsin, Michigan and Minnesota.[1] Those tribes have reserved hunting, fishing and gathering rights in territories ceded in various treaties with the United States. GLIFWC's mission is to assist its

1 GLIFWC member tribes are: in Wisconsin -- the Bad River Band of the Lake Superior Tribe of Chippewa Indians, Lac du Flambeau Band of Lake Superior Chippewa Indians, Lac Courte Oreilles Band of Lake Superior Chippewa Indians, St. Croix Chippewa Indians of Wisconsin, Sokaogon Chippewa Community of the Mole Lake Band, and Red Cliff Band of Lake Superior Chippewa Indians; in Minnesota -- Fond du Lac Chippewa Tribe, and Mille Lacs Band of Chippewa Indians; and in Michigan -- Bay Mills Indian Community, Keweenaw Bay Indian Community, and Lac Vieux Desert Band of Lake Superior Chippewa Indians.

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member tribes in the conservation and management of natural resources and to protect habitats and ecosystems that support those resources. The proposed PolyMet mine is located within the territory ceded by the Treaty of 1854.

Analysis indicates that post-closure groundwater flow from the east pit will be substantial:

The magnitude of the roles that water levels in the Peter-Mitchel (P-M) taconite pits play during post-closure continue to be under-appreciated. We first raised concerns about the effects of P-M pit water levels in 2009 as comments on the 2008 CPDEIS.

Flow direction is not the only factor affected by correctly implementing the P-M pit water elevations at closure. The volume of water leaving the PolyMet east pit is significantly greater if correct P-M pit water elevations are considered.

Both common sense (strong gradient to the north and more conductive bedrock to the north) and modeling, suggest that a substantial portion of the contaminants leaving the PolyMet east pit will move north in the post-closure period (see attached figure). Please note that because the mine pits are both deeply excavated into the bedrock but natural lakes are generally underlain with a lakebed, arguments related to the presence of Argo or other pit-side lakes are not hydrologically relevant to this issue; The connection between the PolyMet pits and the P-M pits is primarily through the relatively high conductivity Virginia Formation and Biwabik Iron Formation bedrock.

Our recent water budget analysis using the USGS utility ZoneBudget indicates that approximately 90% of the water leaving the 1595 foot elevation PolyMet east pit will travel north in bedrock toward the Peter-Mitchel pits when the P-M pits are at their correct closure elevation (1300 feet). Because of the 295 foot greater head pressure of the closed PolyMet east pit compared to the P-M pits and the relatively high conductivity of the Virginia and Biwabik Iron bedrock formations, it is not surprising that the majority of water leaving the PolyMet east pit would flow north.

Preliminary water budget analysis indicates that approximately 300 gpm will exit the PolyMet east pit through bedrock post-closure, when the P-M pits are at 1300 feet. This is in contrast to the total of 10 gpm that Barr Engineering estimated using the same mine pit inflow/outflow model but with P-M pit water elevations that were 316 feet too high (see attached figure). Contaminant transport analysis that accounts for approximately 300 gpm rather than 10 gpm of east pit groundwater discharge is likely to generate different conclusions for water quality at points of compliance.

Additional modeling, with the P-M pit water elevation at 1500 feet (the very long-term P-M pit water elevation), unsurprisingly, shows less flow from the PolyMet east pit (approximately 75 gpm), but the northward flow is still approximately 90% of the total flow from the east pit. The amount of east pit water loss when the P-M pits are at 1300, or at 1500 feet is large, but is of similar scale to the quantities of bedrock flow found by ERM in their bedrock cross-sectional models using MathCad. Those MathCad models were distributed prior to, and discussed in, the July 22 agency technical meeting. The estimates of substantial PolyMet pit outflow identified in this letter were made with the MODFLOW model that was designed by Barr Engineering to estimate mine pit inflow/outflow (Water Modeling Data Package v14, Attachment B, Table 4-4, pFEIS reference Polymet 2015m). A sensitivity analysis of how estimates of pit inflow/outflow at closure respond to boundary conditions (i.e. the P-M pit water levels are model boundary conditions) would further clarify the role that the taconite pits play in the hydrology of the PolyMet site.

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Regardless of whether the PolyMet east pit outflow at closure is 75 or 300 gpm, the scale of flow from the PolyMet pits when the P-M pits are set at their correct closure levels appears to be approximately an order of magnitude greater that the quantity of flow previously considered in contaminant transport. The large underestimate of water leaving the PolyMet east pit by PolyMet's consultant deserves additional evaluation, evaluation that should be conducted by independent experts.

Thank you for considering this issue. As we have in the past, we ask to have technical discussions with other agency staff so that an approach to clarify and address this issue can be developed.

Sincerely,

John Coleman

John Coleman, GLIFWC Environmental Section Leader

cc: Randall Doneen, Environmental Review Unit Supervisor, MN-DNR
Brenda Halter, Forest Supervisor, Superior National Forest
Tamera Cameron, Chief, Regulatory Branch, St Paul District of the Army Corps of Engineers
Kenneth Westlake, NEPA Coordinator, USEPA Region 5
Nancy Schuldt, Water Projects Coordinator, Fond du Lac Environmental Program
Neil Kmiecik, GLIFWC Biological Services Director
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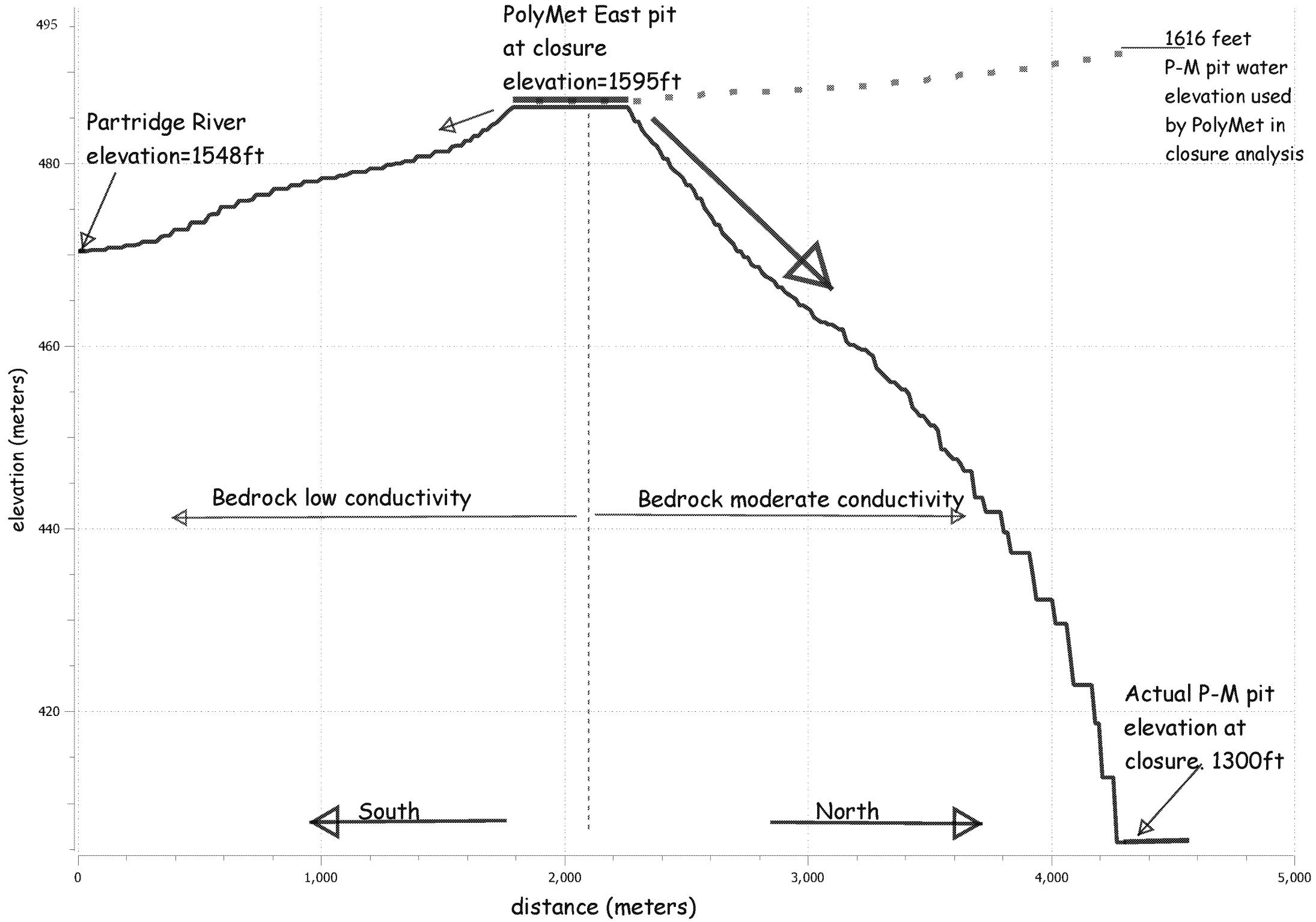
PolyMet East pit
at closure
elevation=1595ft
1616 feet
P-M pit water
elevation used
by PolyMet in
closure analysis
Partridge River
elevation=1548ft
Bedrock low conductivity
Bedrock moderate conductivity
Actual P-M pit
elevation at
closure. 1300ft
South
North
elevation (meters)
distance (meters)
495
480
460
440
420
0
1,000
2,000
3,000
4,000
5,000