



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

OCT 20 2011

REPLY TO THE ATTENTION OF:

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Tamara Cameron
U.S. Army Corps of Engineers
Regulatory Branch
180 Fifth Street East, Suite 700
St. Paul, Minnesota 55101-1678

Steve Colvin
Minnesota Department of Natural Resources
500 Lafayette Road
St. Paul, Minnesota 55155-4040

Ann Foss
Minnesota Pollution Control Agency
Land and Water Quality Permits Section
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Tom Hale
c/o U.S. Forest Service – Superior National Forest
8901 Grand Avenue Place
Duluth, Minnesota 55808-1122

Re: U.S. Environmental Protection Agency Position on Groundwater Well Sampling Frequency and Sample Quantity at the Proposed NorthMet Mine Site

Dear Ms. Cameron, Mr. Colvin, Ms. Foss and Mr. Hale:

The U.S. Environmental Protection Agency (EPA) offers these comments and recommendations on the topics of groundwater well sampling frequency and sample quantity, pursuant to our authorities under the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations (40 CFR Parts 1500-1508), Section 309 of the Clean Air Act, and the Clean Water Act.

On September 29, 2011, EPA met in our Chicago offices with the co-lead agencies (U.S. Army Corps of Engineers, Minnesota Department of Natural Resources, and U.S. Forest Service), the co-leads' consultant, ERM, and PolyMet Corporation representatives, including the company's consultant, Barr Engineering. Topics discussed included groundwater well sampling frequency,

quantity of samples needed, and potential paths forward. EPA's position and rationale is further explained in this letter.

The co-lead agencies have proposed to model water quality at the Mine Site using data from three existing surficial wells. To fully characterize existing baseline conditions, it is necessary to collect sufficient and representative data to characterize the site-specific uncertainties. EPA's analysis of other regional surficial well data sets (Regional Copper-Nickel Study, USGS data, and MPCA data) indicates a potential for high variability. As we have already stated, the original input data is not sufficient for use in water modeling. Further, this limited data set will not reliably characterize baseline conditions or predict future environmental quality, if used as the sole source of groundwater input data to the model.

We have received and reviewed the October 17, 2011 Technical Memorandum from Tina Pint and Jere Mohr of Barr to Richard Clark of MPCA, describing Barr's Draft Workplan for Monitoring Well Installation ("Draft Workplan"). This Draft Workplan calls for installing an *additional* 24 monitoring wells [22 shallow wells and 2 deeper wells (as part of a well pack with 2 of the shallow wells)].¹ The Draft Workplan also proposes three initial rounds of monthly sampling at each well, which would produce 81 additional samples. Barr indicated at the September 29th meeting that 24 samples have been collected and analyzed as of that date from the existing three wells. We believe this Draft Workplan provides a good basis for resolving EPA's concerns over groundwater monitoring data at the Mine Site, as we agree with its proposed initial sample size of 81, and its proposed monthly sampling frequency.

EPA evaluated the available data in the Water Modeling Package Version 6, submitted by PolyMet, to estimate the number of sample measurements needed to characterize baseline conditions at the mine site; we had concluded as of the September 29th meeting that 165 samples were needed for minimal statistical sufficiency. However, it came to our attention recently (October 2011) that Water Modeling Package Version 7 is available on Barr's website. Due to an inaccuracy in labeling of Table 5 in Version 6, EPA was not aware that the data initially used to determine sample measurements included bedrock data, not solely surficial aquifer well data.²

Using the corrected information on surficial well data in Version 7, we re-evaluated the number of sample measurements needed. We suggest a phased approach to determine the number of sample measurements needed to characterize baseline conditions. The initial phase should obtain three sets of measurements from each of the wells (one per sampling event). These 81

¹ Source: Barr Engineering Draft Work Plan for Monitoring Well Installation, NorthMet Mine Site (10/17/2011).

² Version 5 3/24/2011 Table 3.5-1 had Surficial Aquifer data and 3.5-2 has Bedrock data but both tables are labeled "Surficial Aquifer".

Version 6 7/22/2011 Large Table 5 labeled "Surficial Aquifer" and Large Table 6 labeled "Bedrock" but both contain Bedrock data.

Version 7 9/26/2011 Large Table 5 labeled "Surficial Aquifer" and has Surficial Aquifer data.
Large Table 6 labeled "Bedrock" and has Bedrock data.

Note - Surficial Aquifer data and Bedrock data is based on well ID. There is no way to be sure that the analytical results are for the stated well/sample date.

samples and the 24 existing samples then can be used to determine the actual estimate of the final sample size needed using the following formula:

$$n = (((z_1 + z_2)^2 s^2) / IA^2) + 0.5 z_1^2$$

where:

n = number of sample values needed;

z_1 and z_2 values of the Z distribution with $1-\alpha$ and $1-\beta$, respectively;

s^2 = variance; and

IA = acceptable inaccuracy.

Recommended Plan of Action³


To provide a reliable estimate of baseline groundwater conditions at the Mine Site, EPA recommends additional sampling as follows.

1. Sample each of the 27 wells three times (three rounds), for a total of 81 samples, as provided in Barr's October 17, 2011 Draft Workplan.
2. Sample each of the 25 surficial wells at a domestic use level.
3. Complete each round of sampling for each of the 25 surficial wells and 2 deeper wells within the same week. This would offer the most complete picture of overall site conditions.
4. Use a monthly sampling frequency for this initial collection of 81 additional samples, as provided in Barr's October 17, 2011 Draft Workplan.
5. Use these 81 samples, along with the existing 24 samples, as the data set for the modeling effort to predict expected environmental effects for the proposed NorthMet Mine. This data should be included in the modeling used to prepare the Supplemental Draft EIS.
6. Determine, in future discussions between EPA, the co-leads, and the company, the total sample size needed to address variability. This discussion should be based on review of the results from this initial round of 81 additional samples; and the sensitivity analysis for groundwater baseline conditions and mine performance that the co-leads and the company plan to conduct once the model is final.
7. The total resulting data set should then be used as input to the modeling that will be the basis for the Final EIS.

³ EPA's review is limited to evaluating the environmental impact of this project pursuant to its obligations under Council on Environmental Quality regulations (40 CFR Parts 1500-1508), Section 309 of the Clean Air Act, and Section 404 of the Clean Water Act. EPA's "Recommended Plan of Action" does not constitute an endorsement of any design elements for this project.

A technical call is scheduled for October 26, 2011 on groundwater sampling with EPA, the co-lead agencies, and company representatives. This letter is input to that call. If you wish to discuss these comments sooner, please feel free to contact me at 312-886-2910, or by email at westlake.kenneth@epa.gov.

Sincerely,



Kenneth A. Westlake
Chief, NEPA Implementation Section
Office of Enforcement and Compliance Assurance

Cc: Tina Pint and Jere Mohr, Barr Engineering