

## **Class II Modeling Protocol Approval (Plant Site and Mine Site)**

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**From:** Sullivan, Jim (MPCA)  
**Sent:** Wednesday, August 03, 2016 9:32 AM  
**To:** Kevin Pylka; Sommer, Steve (MPCA); Jennifer Saran; 'Todd M. Fasking'; Pat Sheehy (psheehy@barr.com); Eric Edwalds (EEdwalds@barr.com); Jon Bloomberg (jbloomberg@envirolawgroup.com); Baumann, Suzanne (MPCA); Bouchareb, Hassan (MPCA); Ellickson, Kristie (MPCA); Roberson, Ruth (MPCA); Foss, Ann (MPCA); Kohlasch, Frank (MPCA)  
**Subject:** Approval of the Class II PolyMet Mine Site & Plant Site Protocols  
**Attachments:** aq2-43.doc; aq2-44.doc; aq2-44mine.doc; aq2-43mine.doc

Dear Mr. Pylka,

The Minnesota Pollution Control Agency (MPCA) has reviewed the Class II air quality dispersion modeling protocols for the PolyMet, Inc., Plant Site and Mine Site. Based on our review of the April 28, 2016, protocols, along with amendments to address ambient air boundaries, ADJ\_U\*, and deposition methods for PM10, the proposed approaches are approved for use in the development of an ambient air quality dispersion model for the Plant and Mine Site. Our review and approval forms for each protocol are attached to this email. Please submit the final air quality modeling report with the air quality permit application at your convenience.

If you have any questions about our review or the next steps in the modeling and permitting process, please feel free to contact us directly.

Best regards,

James E. Sullivan  
Minnesota Pollution Control Agency  
Risk Evaluation and Modeling Unit  
520 Lafayette Road North  
Saint Paul, MN 55101  
(651) 757-2769  
1.800.657.3864  
<http://www.pca.state.mn.us>



**Minnesota Pollution Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDM-04

## AQDM Protocol Approval Notification Form Air Quality Dispersion Modeling (AQDM) (Previously AQDM PAN-01)

*Doc Type: Air Dispersion Modeling*

**Instructions:** This form is used for Minnesota Pollution Control Agency (MPCA) internal use by Air Dispersion Modeler and Air Permit Engineers to review for Criteria Pollutant Modeling.

### Facility Information

AQ file no.: n/a      AQ facility ID no.: AI 213111      Submittal date (mm/dd/yyyy): 04/28/2016

Three-letter modeling facility ID (ex., ACE, XAK, MEC, NUP, etc.): PMP

Facility name: PolyMet Mining Company, Inc. - Plant Site

Facility street address: P.O. Box 475, 6500 County Road 666

City: Hoyt Lakes      County: St. Louis      State: MN      Zip code: 55750-0475

Protocol prepared by: Pat Sheehy, Eric Edwalds, Barr Engineering      Preparer phone: 612.867.7990

Preparer e-mail address: PSheehy@barr.com; eedwalds@barr.com

### Protocol Approval Notification

This is to notify you that the modeling protocol has been reviewed and is approved or denied as noted below for the project described in the protocol.

If approved, any minor changes to the project after this approval should be made in consultation with Minnesota Pollution Control Agency (MPCA) and documented in the modeling results report that is submitted with your permit application. Major changes from the protocol may result in a request for a re-submittal of the protocol.

Please be aware that federal and state standards and model versions can change over the life of a project, therefore the facility may be asked to update the modeling protocol and/or modeling report to reflect applicable changes.

### Reviewer Information

**Protocol reviewed:**

Modeler name: Jim Sullivan      Final Review date (mm/dd/yyyy): 08/02/2016

Permit engineer name: Hassan Bouchareb      Final Review date (mm/dd/yyyy): 07/18/2016

Areas reviewed: Sullivan - Modeling (non-emissions); Bouchareb - Preliminary Emissions

Modeling information (Non-emissions)     Preliminary emissions

**Protocol is:**     **Approved**     **Conditionally approved**     **Not approved**

Reasons:



**Instructions:** This form is used for Minnesota Pollution Control Agency (MPCA) internal use by Air Dispersion Modelers and Air Permit Engineers to review for Criteria Pollutant Modeling.

## Protocol Information

Today's date - Modeler (mm/dd/yyyy): 08/02/2016 Today's date - Engineer (mm/dd/yyyy): 07/18/2016  
MPCA Air Dispersion Modeler: Jim Sullivan MPCA Air Permit Engineer: Hassan Bouchareb  
Air quality file number: n/a Air quality ID number: AI 213111  
Three-letter modeling facility ID (ex., ACE, XAK, MEC, NUP, etc.): PMP  
Facility name: PolyMet Mining Company, Inc. - Plant Site  
Date protocol was received at the MPCA (mm/dd/yyyy): 04/28/2016

## Approval of Modeling Protocol by Sections - Completed by Air Dispersion Modeler

Section and section name	Acceptable/ Unacceptable	Deficiencies and/or comments
Files to accompany Protocol	Acceptable	No further comment.
<b>Section A:</b> Purpose for air dispersion modeling and related information	Acceptable	The Plant Site and Mine Site modeling will be evaluated in one modeling demonstration for Class II air quality impacts. Separation of the Plant Site and Mine Site protocols was deemed necessary based on the physical distance between the two operations and the unique collection of emission sources at each site. Ultimately, the two protocols will be used to support the permit application and related air quality management decision-making.
<b>Section B:</b> EPA Pre-processors and EPA Post-processors	Acceptable	No further comment.
<b>Section C:</b> Model selection and options (Key CO pathway inputs)	Acceptable	No further comment.
<b>Section D:</b> Emission source characterizations and parameters (Key SO pathway inputs)	Acceptable	Review of source characterizations is appropriate for the intended purpose. Of special note is the manner in which PM10 emissions will be evaluated. Particle size distributions from the tailings basin were determined through sampling and analysis. All other sources of PM10 were evaluated using AP-42. Deposition using AERMOD's Method 1 approach will be included in the modeling for PM10 using AP42 particle distributions and adjusted for site-specific particle density. A July 31, 2016, memorandum from Barr Engineering to MPCA amended the protocol to include the particle distribution analysis and proposed mean mass diameter, fraction, and particle density values for the Method 1 approach. The values provided are reflective of the emission sources at the Mine and Plant site.
<b>Section E:</b> Paved roads fugitive dust	Acceptable	No further comment.
<b>Section F:</b> Receptors (RE pathway)	Acceptable	PolyMet has provided a summary of their Ambient Air Quality Boundary Strategy (Strategy) as part of their protocol submittal (Dated July 13, 2016). The Strategy includes a description of the ambient boundary and the methods that will be used to control the boundary (e.g., posting, control of access points, security patrols, remote cameras, etc.). Natural

		barriers were also discussed; however, the MPCA will need additional site-specific information to confirm the use of natural barriers as a tactic to control access for purposes of protecting ambient air quality. Implementation of the overall Strategy will be based on the final dispersion modeling and will result in an implementation strategy that will result in an enforceable provision of the facility air quality permit. Site-specific use of natural barriers can be evaluated at this time.
<b>Section G:</b> Meteorological data (ME pathway)	Acceptable	PolyMet provided a memorandum dated July 6, 2016, requesting to use meteorological data that had been processed using the adjusted U-star (ADJ_U*) configuration to account for mixing heights related to emissions from sources lower to the ground and their interaction with calm wind conditions. Without the use of ADJ_U*, AERMOD has a tendency to overestimate emissions. The ADJ_U* approach remedies this situation through an adjustment of mixing height that more realistically reflects meteorological conditions and pollutant transport during calm wind conditions. The MPCA agrees with PolyMet's justification and approves the use of ADJ_U* for this project.
<b>Section H:</b> SIL analysis and results	Acceptable	No further comment.
<b>Section I:</b> Background values	Acceptable	No further comment.
<b>Section J:</b> Nearby sources	Acceptable	No further comment.
<b>Section K:</b> Pollutant-based considerations	Acceptable	No further comment.
<b>AQDM-02 Form</b>	Acceptable	No further comment.
<b>Modeling Protocol is:</b>	<b>Approved</b>	
Comments on approvable-status:	<b>No further comment.</b>	

### Approval of Modeling Protocol by Sections - Completed by Air Permit Engineer

Section and section name	Acceptable/ Unacceptable	Deficiencies and/or comments
<b>Section A:</b> Purpose for air dispersion modeling and related information	Acceptable	Please include a narrative describing why the plant site and mine site were submitted as separate protocols but the air quality impacts of each location are evaluated together.
<b>Section D:</b> Emission source characterizations and parameters (Key SO pathway inputs)	Acceptable	Please note that the application submitted that will accompany this modeling protocol should identify the best management practices that will be used for the emergency engines that were not modeled (identified in the protocol as back up generators and fire pumps).
<b>Section E:</b> Paved roads fugitive dust	Acceptable	No comments.
<b>Section K:</b> Pollutant-based considerations	Acceptable	As discussed in previous preapplication meetings, please include secondary formation of PM2.5 in both the Plant and Mine Site protocols. This relates to the nature of modeling the two locations separately but evaluating them together. As evaluating secondary formation of PM2.5 is required for the plant site protocol, it should be evaluated for the mine site as well.
<b>AQDM-02 Form</b>	Acceptable	Plant Site Emission Inventory:  - Emissions data should be updated to reflect the correct inputs for any emission sources that were identified in the Class II modeling file comparison as non-conforming. As both the Class I and Class II files pull some information from the same facility emission inventory tabs, it would be prudent to ensure the correct information is being used in the Class II input files.
Comments on other sections:	No comments.	
<b>Modeling Protocol is:</b>	<b>Approved</b>	
Comments on approvable-status:	<b>As discussed at previous preapplication meetings, please note that any throughput limits, emission limits, or other assumptions that were used to reduce emissions (short term or long term) from any emission source below the maximum capacity of</b>	

the source operating at 8760 hours per year must be included as part of a permit application. These assumptions would be included in any subsequent permit as requirements specific to the emission source(s) and should also include the associated monitoring, recordkeeping, and reporting requirements proposed to show compliance with the applicable requirement.

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**Minnesota Pollution Control Agency**

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St. Paul, MN 55155-4194

# AQDM-04

AQDM Protocol Approval Notification Form  
Air Quality Dispersion Modeling (AQDM)  
(Previously AQDM PAN-01)

*Doc Type: Air Dispersion Modeling*

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## Facility Information

AQ file no.: n/a AQ facility ID no.: AI 213111 Submittal date (mm/dd/yyyy): 04/15/2016  
Three-letter modeling facility ID (ex., ACE, XAK, MEC, NUP, etc.): PMM  
Facility name: PolyMet Mining Company, Inc. - Mine Site  
Facility street address: P.O. Box 475, 6500 County Road 666  
City: Hoyt Lakes County: St. Louis State: MN Zip code: 55750-0475  
Protocol prepared by: Pat Sheehy, Eric Edwalds, Barr Engineering Preparer phone: 612.867.7990  
Preparer e-mail address: PSheehy@barr.com; eedwalds@barr.com

## Protocol Approval Notification

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## Reviewer Information

**Protocol reviewed:**

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Areas reviewed: Sullivan - Modeling (non-emissions); Bouchareb - Preliminary Emissions

Modeling information (Non-emissions)  Preliminary emissions

**Protocol is:**  **Approved**  **Conditionally approved**  **Not approved**

Reasons:



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Facility name: PolyMet Mining Company, Inc. - Mine Site  
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Files to accompany Protocol	Acceptable	No further comment.
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<b>Section C:</b> Model selection and options (Key CO pathway inputs)	Acceptable	No further comment.
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<b>Section E:</b> Paved roads fugitive dust	Acceptable	No further comment.
<b>Section F:</b> Receptors (RE pathway)	Acceptable	PolyMet has provided a summary of their Ambient Air Quality Boundary Strategy (Strategy) as part of their protocol submittal (Dated July 13, 2016). The Strategy includes a description of the ambient boundary and the methods that will be used to control the boundary (e.g., posting, control of access points, security patrols, remote cameras, etc.). Natural

		barriers were also discussed; however, the MPCA will need additional site-specific information to confirm the use of natural barriers as a tactic to control access for purposes of protecting ambient air quality. Implementation of the overall Strategy will be based on the final dispersion modeling and will result in an implementation strategy that will result in an enforceable provision of the facility air quality permit. Site-specific use of natural barriers can be evaluated at this time.
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Comments on other sections:	No comments.	
<b>Modeling Protocol is:</b>	<b>Approved</b>	
Comments on approvable-status:	<b>As discussed at previous preapplication meetings, please note that any throughput limits, emission limits, or other assumptions that were used to reduce emissions (short term or long term) from any emission source below the maximum capacity of the source operating at 8,760 hours per year must be included as part of a permit</b>	



application. These assumptions would be included in any subsequent permit as requirements specific to the emission source(s) and should also include the associated monitoring, recordkeeping, and reporting requirements proposed to show compliance with the applicable requirement.

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