

Acronym information on page 4

Instructions: Changes to modeling protocols initially submitted through the Air Dispersion Modeling e-Services website should be entered on this form.

Please electronically send any updated attachments along with this form via email to: AirModeling.PCA@state.mn.us. If files are too large to email, please mail a CD with the files to:

Air Quality Permit Document Coordinator
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Facility information

Tempo AI ID number: 2929 AQ facility/permit ID number: 06100067 Today's date (mm/dd/yyyy): 02/21/2020

Three-letter modeling facility ID (ex., XEK = Xcel Energy Allen S. King, MEC = Mankato Energy Center, etc.): MMC

Facility name: Mesabi Metalics Company LLC

Facility street address: 17113 County Road 58

City: Nashwauk County: Itasca Zip code: 55769 State: MN

Facility contact: Ryan Heule Report prepared by: Jared Anderson

Facility contact phone: 218-885-6148 Preparer phone: 651-294-4592

Facility contact email address: ryan.heule@mesabimetalics.com Preparer email address: janderson@wenck.com

*UTM coordinates of facility (NAD83, zone 15 extended **only**): x = 483,198.20 m East, y = 5,247,456.08 m North

**This should be the central location of the facility/source.*

This modeling protocol resubmittal is associated with (check all that apply):

- AERA or Dispersion/Deposition modeling for air toxics
- Environmental assessment worksheet
- Environmental impact statement
- Modeling information request
- Modeling impacts from animal feedlots
- Siting an air monitoring station
- Siting a meteorological station
- Permit condition
- Permit modification
- Prevention of significant deterioration
- Screening modeling
- Special project
- State implementation plan

Project description (50 words or less)

Mesabi Metalics Company LLC (MMCL) conducted this modeling in support of the reissuance permit and accompanying "Lookback BACT Report". New information from detailed design work that has been done since the issuance of the 2012 permit indicates that the air flowrates from the indurating furnace stacks (STRU 67 and STRU 68) will vary. Therefore, additional modeling will be completed to demonstrate that ambient air quality standards will still be met by determining if the changes in air flow result in a significant change in the modeled concentrations as compared to the Significant Impact Levels (SILs).

Files updated with this modeling protocol resubmittal

Include all necessary updated files with resubmittal. Use checkboxes to indicate which files were updated.

1. AERMOD input files (*.inp, *.adi, *.ami)
 AERMOD output files (*.out, *.ado, *.amo)
 AERMOD plot files (*.plt)
 AERMOD post files (*.pst) *(If applicable)*
 AERMOD event files (*.evi, *.evo) *(If applicable)*
 AERMOD miscellaneous/other files (MAXDCONT, .DAT, .emi, etc.) *(If applicable)*
2. AERMET files: *.sfc *.pfl
3. BPIP-PRIME files: Input (*.bpi) Output (*.bpo, *.sum) *(If applicable)*
4. AERMAP files: Terrain (*.dem(s), *.tif [NED files]), Input (*.ami), Output (*.rou, *.sou, etc.) *(If applicable)*
5. Background data files: Background concentrations for applicable pollutants (seasonal, monthly, daily, hourly, etc.) *(If applicable)*
6. AQDM-02 spreadsheet: *(If updating the AQDM-02, highlight the cells with changes within the spreadsheet.)*
7. Paved roads results: *(If applicable)*
8. SIL analysis and results: *(If applicable)*
9. Hourly O₃ file: *(If applicable)*
10. AERA forms: *(If applicable)*
11. Other files and supporting documents (paved roads fugitive dust modeling output files, etc.):

Section 1. Initial modeling protocol

1. The Air Dispersion Modeling presented in this resubmittal is to update an Air Dispersion Modeling protocol initially submitted on:

Initial e-Services submittal date (mm/dd/yyyy): 10/28/2016

2. Including this resubmittal, how many submittals have been requested for this protocol: 3

Section 2. Changes to the initial modeling protocol

Table 1: Protocol changes (Please indicate which sections are being changed from the initial modeling protocol.)

Modeling protocol by sections	
Section name	Change/No change
Modeling purpose	No Change
Terrain	No Change
Buildings	No Change
Model selection and options	Change
Point sources	Change
Volume sources	No Change
Area sources	No Change
Area source coordinates	No Change
Paved roads fugitive dust	No Change
Receptors	No Change
Meteorological data	No Change
Area of impact analysis	No Change
Background values	No Change
Nearby sources	Select from list
Pollutant based considerations	Select from list
Attachments	Select from list
AERA forms	Select from list

Section 2.1: Detailed changes to modeling protocol

Please provide specific information corresponding to those sections in Table 1 where changes are indicated.

Modeling purpose

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Terrain

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Buildings

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Model selection and options

MPCA approved change: Yes No Date (mm/dd/yyyy): 12/12/2019

Describe changes:

SO2 Significant Impact Level (SIL) modeling was completed for STRU068 and STRU067 sources only to confirm BACT limit changes will not be necessary for the reissuance of the permit. See the point sources section below for more detail.

Point sources

MPCA approved change: Yes No Date (mm/dd/yyyy): 01/02/2020

Describe changes:

Modeled exhaust flowrates were revised for the indurating furnace stacks, STRU 67 and STRU 68, after considering all available operating scenario information. These operating scenarios were evaluated for the Lookback BACT analysis. From this review, MMCL determined that the past air dispersion modeling may not have evaluated the worst case conditions for dispersion. The additional model runs demonstrate that varying the type of taconite pellet grade produced, and the production level achieved, does not have a significant effect on SO2 ambient concentrations.

Two model runs were necessary to model emission limits at 5 ppm calculated by MPCA for STRU068 and maximum uncontrolled emissions for STRU067 with minimum airflows to each stack during times of maximum production. Two additional model runs were necessary to model scenarios with minimum airflows at partial taconite pellet production, at each stack paired with corresponding emissions (see Attachment A). Completing the modeling in this manner represents a conservative approach for Significant Impact Level modeling to envelope the maximum emissions with minimum airflows yet retaining realistic combinations of emissions and airflow, which still reflects worst-case conditions. Additionally, the differences between the model inputs and the AQDM-02 spreadsheet were adjusted to match as pointed out in Ben Wenkel's February 13, 2020 email. The Emission Inventory included with electronic modeling files provides additional information on these four modeling scenarios.

Volume sources

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Area sources

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Area source coordinates

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Paved roads fugitive dust

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Receptors

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Meteorological data

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Area of impact analysis

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Background values

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Nearby sources

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Pollutant based considerations

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Attachments

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

AERA forms

MPCA approved change: Yes No Date (mm/dd/yyyy): _____

Describe changes:

Section 3. Discussion

Enter any discussion or additional comments on the information provided in this form:

Instructions: If a preliminary SIL analysis has been conducted for this project, please provide results in table H-01 below. Please also attach corresponding model output files with your e-Services submittal.

Note: Refer to the Minnesota Pollution Control Agency's (MPCA) Modeling Practice Manual, "How To Model, Part II: Setting Up the Model," "Step one – Impact Area Evaluation" for more information.

SIL analysis and results

Table H-01, Class II Significant Impact Levels modeling results:

Pollutant	Averaging time	Modeled impacts (H1H) ($\mu\text{g}/\text{m}^3$)	SILs ($\mu\text{g}/\text{m}^3$) *As of 10/26/2010	% of SIL	Exceed SIL?	Radius of impact (If exceeds SIL)
SO ₂	1-hr	5.49	7.83	69.99%	No - Complete	km
	3-hr	3.12	25	12.00%		
	24-hr	0.75	5	15.00%		
	Annual	0.04	1	4.00%		
PM ₁₀	24-hr		5	0.00%	(blank)	km
	Annual		1	0.00%		
PM _{2.5}	24-hr		1.2	0.00%	(blank)	km
	Annual		0.3	0.00%		
NO ₂	1-hr		7.52	0.00%	(blank)	km
	Annual		1	0.00%		
CO	1-hr		2000	0.00%	(blank)	km
	8-hr		500	0.00%		

Additional information for this section that was not included above (if not applicable, place N/A in field below):

Airflows Table

Stack ID/Scenario	SO2 Emission Rate (lb/hr)	Airflow (acfm)
Scenario B		
STRU67	55.7	655,796
STRU68	37.3	811,203
Scenario D		
STRU67	55.7	848,112
STRU68	29.1	633,407
Scenario A		
STRU67	35.1	413,656
STRU68	23.5	511,682
Scenario G		
STRU67	35.1	530,131
STRU68	17.7	385,908