Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

AQDMR-01

Air Quality Dispersion Modeling Report(AQDMR)

Protocol Form for Criteria Pollutant Modeling

Doc Type: Air Dispersion Modeling

Acronym Information on Page 6

Instructions: Permit applicants required to conduct air dispersion modeling should submit two paper copies of the completed Air Quality Dispersion Modeling Report form (AQDMR-01) and all accompanying files to:

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

Applicants may also submit an electronic version in addition to the two paper copies.

Electronic copies of the forms and accompanying files should be sent to: AirModeling.PCA@state.mn.us.

Facility Information

AQ tracking number: _____

AQ file no.: _____ AQ facility/permit ID no.: _____ Today's date (mm/dd/yyyy): _____

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

Facility name: _____

Facility street address: _____

City: _____ County: _____

State: _____ Zip code: _____ Elevation at facility: _____ m

Facility contact: _____ Protocol prepared by: _____

Facility contact phone: _____ Preparer phone: _____

Facility contact e-mail address: _____ Preparer e-mail address: _____

Latitude, Longitude of facility (Decimal degrees to **four** decimal places): _____ N, _____ W

UTM coordinates of facility (NAD83, zone 15 extended **only**): x = _____ m East, y = _____ m North

This report is associated with:

- ☐ Permit application
- ☐ Permit requirement
- ☐ Other: _____

Project Description (50 words or less)

Files to Accompany Modeling Report

Include the following files with the completed modeling report form. Use checkbox to indicate that all applicable files are included.

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, ?, ?, etc.) – If applicable

2. AERMET files: ☐ *.sfc ☐*.pfl
3. BPIP-PRIME files: ☐ Input (*.bpi) ☐ Output (*.bpo, *.sum)
4. AERMAP files: ☐ Terrain (*.dem(s), *.tif (NED files)), ☐ Input (*.ami), ☐ Output (*.rou, *.sou, etc.)
5. Background data files: ☐ Background concentrations for applicable pollutants (seasonal, monthly, daily, hourly, etc.)
6. Modeling Results: ☐ Figures (*.jpeg, *.pdf), ☐ GIS Maps (*.shp)
7. AQDMPS-01 spreadsheet*: ☐
8. Other files and supporting documents (SMSv*.xls, Far sources, readme, etc.):

* *Provide the final spreadsheet (i.e. AQDMPS-01) and indicate/highlight changes.*

Section 1. Modeling Protocol

1. The Air Dispersion Modeling presented in this report is based on a Protocol that has been:

   ☐ Approved ☐ Conditionally approved ☐ *MPCA approval date (mm/dd/yyyy): _____

   **This is the date given on AQDM PAN-01 form*

2. Does this Modeling submittal **completely** follow the Approved Protocol? ☐ Yes ☐ No
   If yes, proceed to Section 3.
   If no, proceed to Section 2.

Section 2. Changes to Modeling Protocol

Table 1: Protocol Changes (Please indicate which sections in Approved Protocol contain changes.)

Modeling protocol by sections

Section and section name	**Change/No change**
Files to accompany protocol	Select from list
Section A *Purpose for Air Dispersion Modeling and Related Information*	Select from list
Section B *EPA Pre-Processors and EPA Post-Processors*	Select from list
Section C *Model Selection and Options (Key CO Pathway Inputs)*	Select from list
Section D *Emission Source Characterizations and Parameters (Key SO Pathway Inputs)*	Select from list
Section E *Paved Roads Fugitive Dust (as per MPCA April 25, 2011 Policy)*	Select from list
Section F *Receptors (RE Pathway)*	Select from list
Section G *Meteorological Data (ME Pathway)*	Select from list
Section H *SIL Analysis and Results*	Select from list
Section I *Background Values*	Select from list
Section J *Nearby Sources*	Select from list
Section K *Anticipated Outputs (OU Pathway)*	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.

Section A. Purpose for air dispersion modeling and related information

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

Describe changes and/or indicate section item number(s):

Section B. EPA pre-processors and EPA post-processors

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

Describe changes and/or indicate section item number(s):

Section C. Model selection and options (Key CO pathway inputs)

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

Describe changes and/or indicate section item number(s):

Section D. Emission source characterizations and parameters (Key SO pathway inputs)

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

Describe changes and/or indicate section item number(s):

Section E. Paved roads fugitive dust

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

Describe changes and/or indicate section item number(s):

Section F. Receptors (RE pathway)

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

Describe changes and/or indicate section item number(s):

Section G. Meteorological data (ME pathway)

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

Describe changes and/or indicate section item number(s):

Section H. SIL analysis and results

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

Describe changes and/or indicate section item number(s):

Section I. Background values

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

Describe changes and/or indicate section item number(s):

Section J. Nearby sources

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

Describe changes and/or indicate section item number(s):

Section K. Anticipated outputs (OU pathway)

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

Describe changes and/or indicate section item number(s):

Section 3. Paved Roads Fugitive Dust (Optional)

Facilities that have indicated in AQDMP-01 form the exclusion of paved roads in the air dispersion modeling should provide the results of that modeling in Table 1. (See the AQDMP-01 form for details.)

Table 1: Paved Road Dust modeling results

	Averaging Period	NAAQS ($\mu g/m^3$)	Total Modeled NAAQS Concentration (includes Background and Nearby Sources) (ug/m^3)	% of NAAQS	PSD Class II Increments ($\mu g/m^3$)	Modeled Class II Increment Impact Concentrations ($\mu g/m^3$)	% of Class II Increments
PM_{10}	24-hour	150		0.00%	30		0.00%
	Annual	50		0.00%	17		0.00%
$PM_{2.5}$	24-hour	35		0.00%	9		0.00%
	Annual	15		0.00%	4		0.00%

Section 4. Modeling Results

Table 2: Pollutants and averaging periods (Indicate with an "X" all pollutant and averaging period(s) modeled.)

Pollutant	Averaging Period	Standard		Increment
		NAAQS	MAAQS	
CO	1-hr			
	8-hr			
Lead	Rolling 3 mo. Avg			
	Quarterly Avg			
NO_2	1-hr			
	Annual			
SO_2	1-hr			
	3-hr			
	24-hr			
	Annual			
PM_{10}	24-hr			
	Annual			
$PM_{2.5}$	24-hr			
	Annual			

Table 3: NAAQS/MAAQS modeling results (Enter modeling results along with the percent of standard.)

Pollutant	Averaging period	NAAQS standard (ug/m^3)	MAAQS standard (ug/m^3)	Total modeled concentration (includes background and nearby sources) (ug/m^3)	Percent of standard (%)	
					NAAQS	MAAQS
CO	1-hr	40,000	35,000			
	8-hr	10,000	10,000			
Lead	Rolling 3 mo. Avg	0.15	***			
	Quarterly Avg	1.5	1.5			
NO_2	1-hr	188	***			
	Annual	100	100			
SO_2	1-hr	196	1300			
	3-hr	***	1300/*915			
	24-hr	365	365			
	Annual	80	60			
PM_{10}	24-hr	150	150			
	Annual	***	50			
$PM_{2.5}$	24-hr	35	65			
	Annual	15	15			

**SO2 3-hr for Northern Minnesota is 915 ug/m3.*

Table 4: Increment modeling results (Provide the increment modeling results along with the percent of standard.)

Pollutant	Averaging Period	Class II Increment (ug/m^3)	Total Modeled Concentration (includes other increment sources) (ug/m^3)	Percent of Standard (%)
NO_2	1-hr	***		
	Annual	25		
SO_2	1-hr	***		
	3-hr	512		
	24-hr	91		
	Annual	20		
PM_{10}	24-hr	30		
	Annual	17		
$PM_{2.5}$	24-hr	9		
	Annual	4		

Section 5. Discussion

Enter any discussion comments:

Section 6. Modeling Results Figures/Maps

Insert a figure or map showing the facility emission sources, receptors, and the location of the modeled maximum concentration(s) for each applicable pollutant, corresponding averaging periods, and operating scenarios. Figures or maps should correspond to Section 3 NAAQS and Increment results.

[Paste here]

Acronyms

$\mu g/m^3$	Micrograms per cubic meter
AERMAP	AERMOD Terrain Preprocessor
AERMET	AERMOD Meteorological Preprocessor
AERMOD	AMS/EPA Regulatory Model
AQ	Air Quality
AQDMP-01	Air Quality Dispersion Modeling Protocol form
AQDMPS-01	Air Quality Dispersion Modeling Protocol Spreadsheet
BPIP-PRIME	Building Profile Input Program for PRIME
CO	Carbon Monoxide
EPA	U.S. Environmental Protection Agency
FAC	3-letter facility ID
MAAQS	Minnesota State Ambient Air Quality Standard
MPCA	Minnesota Pollution Control Agency
NAAQS	National Ambient Air Quality Standard
NO_2	Nitrogen Dioxide
OU	Operable Unit
Pb	Lead
PM_{10}	Particulate Matter less than 10 um in size
$PM_{2.5}$	Particulate Matter less than 2.5 um in size
PRIME	Plume Rise Model Enhancements
PSD	Prevention of Significant Deterioration Program
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
SIP	State Implementation Plan
SMS	Standardized Mobile Source
UG/M3	Micrograms per cubic meter ($\mu g/m^3$)
UTM	Universal Transverse Mercator