

**EXHIBIT M:  
AMBIENT AIR MONITORING PROCEDURES for  
DETERMINATION OF COMPLIANCE**

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**1. General**

This exhibit shall apply to all emission facilities that are required to perform ambient air monitoring in order to demonstrate compliance of State and Federal ambient air quality standards or permit conditions, unless otherwise stated by special conditions of the permit.

**2. Network design for criteria and non-criteria pollutants**

All air monitoring networks intending to demonstrate attainment with State and Federal ambient air quality standards must comply with the requirements in the Code of Federal Regulations Title 40 Part 58.14.

Location, number of monitors, parameters, and duration of the study shall be determined through the permit process.

**3. Probe and Siting Criteria**

Probe siting and placement for criteria pollutants must comply with specifications described in the Code of Federal Regulations Title 40 Part 58 Appendix E. Each monitoring site must have a site and monitor information form completed prior to submission of data (see attached appendix A).

Probe siting for non-criteria pollutants must meet requirements prescribed in the approved method for the target parameter.

**4. Monitoring Methods**

All criteria pollutants must be measured by U.S. Environmental Protection Agency (EPA) reference or equivalent methods, approved in accordance to Title 40 Part 58 Appendix C of the Federal Code of Regulations.

A list of "Designated Reference and Equivalent Methods" and "Acceptable Methods for Non criteria Pollutants" may be obtained on the EPA's [Ambient Air Monitoring Technology Information Center \(AMTIC\) website](#).

The MPCA must be informed of any method change performed during the monitoring project. The method change must be reported within 45 working days from the end the reporting quarter in which the change took place.

Non criteria pollutants must be measured by methods approved by the U.S. EPA. If no method exists, MPCA will suggest candidate methods recommended by the U.S. EPA or other methodology.

**5. Monitoring Plan / Quality Assurance Project Plan**

Permittee or operator must submit a monitoring plan that incorporates a quality assurance plan to the MPCA's Environmental Analysis and Outcomes Division at least 30 days prior to the start date of the air monitoring project. The Agency shall review the monitoring quality assurance plan to ensure

compliance with EPA requirements of monitoring networks and determine whether adequate quality control measures are utilized to ensure acceptable levels of quality data.

#### **A) Elements of Monitoring plan / Quality Assurance Project Plan**

The primary guidance for developing a quality assurance plan is specified in EPA *Requirements for QA Project Plans (QA/R-5)* and the Code of Federal Regulations 40 Part 58 Appendix A.

In general, the following elements must be addressed in a monitoring plan:

1. General description of all monitors and monitoring locations.
2. Description of calibration methods and reference standards.
3. Sampling schedule for manual methods.
4. Summary of standard operating procedures.
5. Description of routine quality control checks, including frequency.
6. Control limits for zero, span, and other control checks including audits
7. Performance audit procedures and reference standard traceability.
8. Plan of corrective actions when monitors fail to meet control/audit limits.
9. Description of recording and validating data.
10. Format of data submission.

#### **B) Audits**

In addition to the quality assurance program developed by the permittee, the MPCA will conduct performance and systems audits on all criteria pollutant monitors. A similar audit format will be designed for non-criteria pollutants dependent upon pollutant parameters. Frequency of scheduled MPCA audits will be determined by the permit process.

### **6. Data Submittal**

All permittees required to submit data to the agency must do so no later than 45 working days past the end of each calendar quarter. All data should be submitted electronically to the Ambient Air Quality Data Manager and the Compliance Tracking Coordinator.

Monitoring site information, monitoring data and quality control results must be compliant with submission requirements of the MPCA “Ambient Air Quality Data Submission Standard” (Appendix A of this document).

Any Questions concerning this standard should be directed to the Ambient Air Quality Data Manager. Currently the Ambient Air Quality Data Manager is Kellie Gavin and can be reached at (651) 757-2379 or [kellie.gavin@pca.state.mn.us](mailto:kellie.gavin@pca.state.mn.us).

#### **A) PM<sub>2.5</sub>**

The permittee shall include the following data assessment information as per CFR Title 40 Part. 58 App. A. section 5.2, for each sampling quarter:

1. Precision probability limits and percentage differences from section 4.3.1 of CFR 40 Part 58 App. A.

2. Flow Rate Verification results and percentage differences from section 3.2 of CFR 40 Part 58 App. A.
3. All data used to calculate the reported estimates of precision and accuracy including reference standard certifications, collocated sampler and audit results must be made available to the MPCA upon request.

#### **B) Non criteria Pollutants**

Data collected for non-criteria pollutants must be accompanied by any pertinent quality control information obtained during the reporting quarter. This would include the following information, where applicable:

1. Sampling train flow rate checks.
2. Field blank data.
3. Analytical blank data.
4. Spiked sample percent recoveries.
5. Calibration check standard results.
6. Internal audit results.
7. Sample Duplicate results

Any documentation deemed necessary to assess reported data including, laboratory and field logbooks, mass spectra data, strip charts, and calibration data must be made available to the MPCA upon request.

#### **7. Data Validation**

The requirement for data recovery is 75 percent of all data possible from each sampling quarter for automated and manual methods. Minimum recovery for the meteorological parameters of wind speed and wind direction is 80 percent from each sampling quarter.

Data that is determined to be invalid must be deleted from the reported data base. The reasons for invalidation of data must be reported to the MPCA. There should not be any correlation between missing data periods and expected highest concentrations.

## **Appendix A: Ambient Air Quality Data Submission Standard**

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The Environmental Analysis and Outcomes Division (EAOD) of the Minnesota Pollution Control Agency collects ambient air quality data in order to assess the quality of the air in the state, and to determine compliance with both the National Ambient Air Quality Standards (NAAQS) and Minnesota Ambient Air Quality Standards (MNAAQS). The ambient air quality data is collected from a network of air monitoring stations maintained by the EAOD and from networks required of some regulated industries.

### **Section I.**

#### **The Minnesota Air Quality Data Handling System**

The Minnesota Air Quality Laboratory Information Management System (LIMS) is a computerized data handling system that accepts, stores, and reports information relating to ambient air quality data. The purpose of the LIMS is to compile and organize air monitoring data from all air monitoring networks within the state into a useful format acceptable to the U.S. EPA. To facilitate this, all information submitted to LIMS must be in a standardized format. Special input formats and a system of codes developed by the EPA for their Air Quality System (AQS) database or by the MPCA for specific needs have been adopted to ensure standardization and ease of data submission on the part of any contributing organization. In addition, a number of edit checks have been instituted to screen data being submitted to the system.

This document specifies the media, file types, data coding formats, and procedures for submitting information related to ambient air quality data to the MPCA. Section II addresses sampling site information, section III addresses air quality data, section IV addresses precision and accuracy data, and section V gives some general information.

There are three distinct classes of information that are accommodated in LIMS: site information, ambient air quality data, and precision and accuracy information. These are described below:

1. *Site information:* detailed descriptive information about the location and environment of the sampling site and the parameters monitored. This includes the state, county, and city where the site is located, the geographic coordinates of the site, and its elevation above local terrain and mean sea level. It also includes a description of the site location, the dominating influence on the sampler within approximately a 1-mile radius of the sampling site, and more.
2. *Ambient air quality data:* The information that must be supplied to LIMS in order to completely characterize the measurement. This includes the location of the sampling site, the parameters measured, the method of collection and analysis, the duration of the sample, the date and time of the sample, the result of the measurement, and more.
3. *Precision and Accuracy data:* The information that must be supplied to LIMS in order to determine the precision and accuracy of collection and analysis methods employed in obtaining ambient air quality data. This includes raw data from bi-monthly precision checks and from quarterly audits.

Site information is submitted only once for each location, although it must be updated whenever the site environment changes. Air quality data are supplied continuously to the EAOD by its own network of monitors and periodically by the networks of some regulated industries. Precision and accuracy data are submitted each calendar quarter.

## **Section II.**

### **Sampling Site and Monitor Information**

Before any air quality data from a monitor can be submitted to LIMS, site and monitor information must be supplied to the EAOD Ambient Air Quality Data Manager. After the data manager has received the necessary site and monitor information, an identity will be assigned to the monitor. This monitor identity must be used to submit the air quality data from the monitor.

Forms are provided on page 9-12 for submitting site and monitor information. Whenever the site or monitor information changes, the data manager must be notified of the changes.

#### **A. Site Information**

The information required to establish a new site is listed in Table 1; this information must be sent to the data manager whenever a new site is established. The information listed in Table 2 is optional; this information is requested to help prevent the misinterpretation of any ambient air quality data that is obtained by a monitor.

The date of the last air quality sample collected by a monitor must be provided when a monitor is removed from a site. This date must be sent to the EAOD Ambient Air Quality Data Manager whenever a site is terminated. All monitors which ever existed at the site must have a date sampling ended before or on the date the site is terminated.

#### **B. Monitor Information**

The information required to add a monitor to a site is listed in Table 3; this information must be sent to the EAOD ambient air quality data manager whenever a monitor is added to a site. In addition, the information listed in Table 4 is required when a 24-hour sampler is added to the site. The information listed in Table 5 is optional; this information is requested to help prevent the misinterpretation of any ambient air quality data that is obtained by a monitor.

The date of the last air quality sample collected by a monitor must be provided when a monitor is removed from a site. This date must be sent to the data manager whenever a monitor is removed.

### **Section III.**

#### **Air Quality Data**

The technical specifications for acceptable submission of air quality data are as follows:

1. Dataset file type: Pipe delimited text file
2. Medium: Text file submitted electronically is preferred.
3. Data coding format: Air Quality System (AQS) formatted transactions. A transaction is a pipe delimited text file. The structure of AQS formatted transactions can be found in the Input Transaction Formats document on the [AQS Manuals and Guides website](#).

### **Section IV.**

#### **General**

All submitted data must adhere to this standard unless the Environmental Analysis and Outcomes Division of the MPCA approves an alternative. Failure to comply with this standard will result in the rejection of the submitted data and possible violation of any agreements requiring the submission of ambient monitoring data.

## Information Requirements

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The following tables define the required fields of the attached forms:

**Table 1. Required site information**

Site name and/or site identification number	Name and/or identification number used by the supporting agency.
Date site established	Date on which a monitoring site began collecting air quality data.
Supporting agency	Name of agency, company, or organization that is responsible for the operation of the monitoring site.
Site address	Street number, street name, city, and zip code of the monitoring site.
State	Name of state where the site is located.
County	Name of county where the site is located.
City	Name of city where the site is located or none.
Location data	Either longitude and latitude or Universal Transverse Mercator (UTM) System coordinates. Include method used to determine coordinates and an estimate of the accuracy of the location data.
Elevation MSL	Elevation in meters above Mean Sea Level of the site
Land use	Identifies the prevalent land use within 1.4 mile of the site (residential, commercial, industrial, agricultural, forest, desert, mobile, or blighted area)
Location setting	Type of environment in which the site is located (urban, suburban or rural)
Meteorological data	Is met data collected for this site?
	If so, is it collected at this location or at a different location?
	If it is collected at a different location: what is the location, how far is it from this site, and in what direction?

**Table 2. Optional site information**

Street information	Street/highway name of any streets/highways close enough to have a significant impact on the site, up to 3 streets may be listed
	Type: Arterial, Expressway, Freeway, Major Street or Highway, Through Street or Highway, Local Street or Highway
	Distance from monitor to street in meters
	Direction from site to street
	The annual average daily traffic (ADT)
Compass sector	True (as opposed to magnetic) direction of the site from the central business district or monitored source.
Distance to city	Distance in kilometers of the site from the center of the downtown central business district in which the site is located, or the monitored source.
Description	Textual description of the location of the site.
Comments	Any other useful information.

**Table 3. Required monitor information**

Parameter	Name of parameter monitored by this monitor (e.g. carbon monoxide, lead, pm-10, hydrogen sulfide, etc.)
POC	Parameter Occurrence Code: 1 for primary monitor, 2 for collocated monitors.
Date sampling began	Date on which air quality samples were first collected by the monitor.
Collection lab	Name of laboratory responsible for collection of air quality measurement samples.
Analyzing lab	Name of laboratory responsible for analysis of air quality measurement samples.
Analyzer manufacturer and model and/or AQS method code	The 3 digit code assigned to a particular analysis and collection method by the EPA; usually associated with an analyzer make and model type.
Project class	Designates the type of sampling (population-oriented, source-oriented, background, special studies, duplicate sampling, complaint investigation etc.).
Dominant source	Indicates the primary source of the pollutant being monitored (point, area, mobile)
Measurement scale	Denotes the geographic scope of the measurements of air quality data made by this monitor. (see CFR 40 pt. 58, App. D for a discussion of measurement scales for each criteria pollutant)
Monitoring objective	Primary reason for measuring air quality data at this monitor (maximum concentration, population-exposure, background, source-oriented; see CFR 40 pt. 58, App. D for more discussion of monitoring objective in relation to measurement scale).
Probe height	Height of sampling probe from ground in meters

**Table 4. Required information for 24-hour samples**

Sampling frequency	Frequency of 24-hour samples (daily, every other day, every sixth day, etc.)
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**Table 5. Optional monitor information**

Unrestricted air flow	Is the probe air flow restricted?
Obstructions	Direction and distance of any obstructions from probe.
Obstruction type	Type of each obstruction listed: buildings, trees/brush, ridges, cliffs, structure other than building, etc.
Comments	Any other useful information.



**Ambient Air Monitoring Site Information Form**

Site ID #: \_\_\_\_\_

New \_\_\_\_\_ Change \_\_\_\_\_

Date established: \_\_\_\_\_

Date terminated: \_\_\_\_\_

**Supporting agency:** \_\_\_\_\_

Street address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip code: \_\_\_\_\_

**Site name:** \_\_\_\_\_

Site address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip code: \_\_\_\_\_ County: \_\_\_\_\_

**Geographical coordinates: fill in either UTM coordinates OR Latitude / Longitude**

UTM Coordinates:

Zone: \_\_\_\_\_ North: \_\_\_\_\_ East: \_\_\_\_\_

Longitude and Latitude:

Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

**Geographical coordinate measurement information:**

Method of determination: \_\_\_\_\_

Estimate of accuracy: \_\_\_\_\_ Datum: \_\_\_\_\_

**Elevation** (mean sea level)

Elevation: \_\_\_\_\_ Estimate of accuracy: \_\_\_\_\_

Method of determination: \_\_\_\_\_

**Land Use** (check one)

Residential \_\_\_\_\_ Commercial \_\_\_\_\_ Industrial \_\_\_\_\_ Agricultural \_\_\_\_\_

Forest \_\_\_\_\_ Desert \_\_\_\_\_ Mobile \_\_\_\_\_ Blighted areas \_\_\_\_\_

**Location Setting** (check one)

Rural \_\_\_\_\_ Suburban \_\_\_\_\_ Urban &amp; City center \_\_\_\_\_

## Ambient Air Monitoring Site Information Form

### Meteorological Data

Is meteorological data collected for this site? Yes \_\_\_ No \_\_\_

If yes, is it collected at this site or at another site? This site \_\_\_ Another site \_\_\_

If met data is collected at a different site, fill in the following:

Meteorological site ID or name: \_\_\_\_\_

Distance from site to meteorological site: \_\_\_\_\_ km

Direction from site to meteorological site: \_\_\_\_\_

### Street Information

	Name	Type	Direction to Site	Traffic Count*	Year
1.					
2.					
3.					
4.					

\*Annual Daily Average

Type: 1) Arterial 2) Expressway 3) Freeway 4) Major Street 5) Thru Street 6) Local Street

**Compass Sector:** \_\_\_\_\_

**Distance to City (km):** \_\_\_\_\_

**Site Description:**

**Comments**

**Ambient Air Monitoring Monitor Information Form**

New \_\_\_\_ Change \_\_\_\_

For office use: AQS monitor Id: \_\_\_\_\_

Site ID: \_\_\_\_\_ Date sampling began : \_\_\_\_\_

Parameter: \_\_\_\_\_ Sampling ended : \_\_\_\_\_

**Collection laboratory:** \_\_\_\_\_

Site address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip code: \_\_\_\_\_

**Analysis laboratory:** \_\_\_\_\_

Site address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip code: \_\_\_\_\_

**Analyzer manufacturer:** \_\_\_\_\_

Analyzer model: \_\_\_\_\_

Collection and analysis method code: \_\_\_\_\_

Serial #: \_\_\_\_\_ MPCA Asset #: \_\_\_\_\_

**Project Classification (check one):**

<input type="checkbox"/> Population-oriented	<input type="checkbox"/> Source Oriented	<input type="checkbox"/> Background Surveillance
<input type="checkbox"/> Complain Invest	<input type="checkbox"/> Special Studies	<input type="checkbox"/> Episode Monitoring
<input type="checkbox"/> Exposure Studies	<input type="checkbox"/> Duplicate Sampling	<input type="checkbox"/> Continuous Monitoring

**Dominant Source (check one):**
 Point                       Area                       Mobile
**Measurement Scale (check one):**
 Micro Scale     Middle Scale     Neighborhood     Urban Scale     Regional
**Monitoring Objective (check one):**
 Highest Concentration     Population Exposure     General Background     Source Impact
**Monitor Type (check one):**
 Unknown     SLAMS     Other     Industrial     Index

## Ambient Air Monitoring Monitor Information Form

**Probe Location** (check one):

Roof Top   
  Side of Building   
  Support at Ground Level  
 Pole   
  Other   
  Top of Tower (met equipment)

**Probe height (m):** \_\_\_\_\_      **Unrestricted Air Flow?** (circle one)    **Y**   or   **N**

**24-hour samplers only:**

Req. Sampling Frequency	Date effective
_____	____/____/____
_____	____/____/____
_____	____/____/____

For “stratified random”, “random”, or “seasonal” sampling frequency fill in the number of samples per month:

Jan.\_\_\_\_    Feb.\_\_\_\_    Mar.\_\_\_\_    Apr.\_\_\_\_    May.\_\_\_\_    Jun.\_\_\_\_  
 Jul.\_\_\_\_    Aug.\_\_\_\_    Sep.\_\_\_\_    Oct.\_\_\_\_    Nov.\_\_\_\_    Dec.\_\_\_\_

**Obstructions:**

#	Type	Direction	Distance	Height
1	_____	_____	_____	_____
2	_____	_____	_____	_____
3	_____	_____	_____	_____

Types: 1.building, 2.trees/brush, 3.ridges, 4.cliffs, 5..structure other than building.  
 Distance and height in meters. Direction in 8-point compass.

**Comments:**