Wisconsin Department of Natural Resources 2024 Air Monitoring Network Plan

June 2023

Signature Page

By the signature below, the Wisconsin Department of Natural Resources, Air Monitoring section certifies that the information contained in this network document for 2024 is complete and accurate at the time of submittal to US EPA Region 5. However, due to circumstances that may arise during the year, some network information may change. A notification of change and a request for approval will be submitted to US EPA Region 5 at that time.

Signature_____ Date_____

Chief, Air Monitoring Section

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Public Notification and Comment Period

The annual monitoring network plan details the operation and locations of ambient air monitors operated by the Wisconsin Department of Natural Resources (DNR) Air Monitoring Section. Pursuant to federal requirements (40 C.F.R. 58.10(a)(1)), the DNR will provide a 30-day public comment period for review of this ambient air quality monitoring network plan. Written comments on this monitoring network plan document may be submitted no later than June 11, 2023 electronically via email to Katie.Praedel@Wisconsin.gov or mailed, contact is information is as follows:

Ms. Katie Praedel,
c/o Air Monitoring Section, Air Management Program,
P.O. Box 7921,
Madison, WI 53707

Email: Katie.Praedel@Wisconsin.gov

Written comments will have the same weight and effect as oral comments presented at the meeting. A copy of the proposed revision to the Monitoring Plan is available for public inspection on the following web address: http://dnr.wi.gov/topic/AirQuality/Monitor.html or by mail (at no charge) from Ms. Katie Praedel at the address noted above.

Disclaimer

The network design proposed in this document represents a balance between the desired number of monitors and monitoring frequency; and expected funding levels. The network configuration considers monitoring history, population distribution, federal monitoring requirements under the Clean Air Act (CAA), 40 Code of Federal Regulations (CFR) Part 58 and expected funding levels.

Recommended changes to this network will be implemented during the May 2023 through December 2024 time period, contingent upon adequate funding levels.

Network operations may change during the years without public notice based on unexpected circumstances. Examples of unexpected circumstances include catastrophic equipment failure, construction or demolition activities, loss of site access, or monitor obstructions.

Table 1: Summary of Network Changes Implemented from the 2023 Annual Network Plan

May 1, 2021 – December 31, 2022

Monitoring Site	AQS Site ID	Site	Ozone	$PM_{2.5}$	PM_{10}	$PM_{10-2.5}$	SO_2	NO_2	CO	Meteorological	Metals (PM_{10})	NOy	PAH	VOC / Carbonyl	Hg	AmoN	MDN	NTN	CSN
Brule River	N/A																T2	T2	
Chiwaukee Prairie Stateline	55-059-0019											T							
Green Bay East	55-009-0005						T								T				
Harrington Beach	55-089-009									T3									
Horicon	55-027-0001										T		T		T	T			
Madison East	55-025-0041						T												A
Milwaukee UWM UPark	55-079-0068		M1																
Perkinstown	55-119-8001																		T

A = Addition
M = Modification
T = Termination

1=Change year-round monitor to seasonal
2=Transfer of ownership
3=Barometric Pressure

Acronyms, Abbreviations, and Definitions

Terms	Definition
AirMoN	Atmospheric Integrated Research Monitoring Network
AIRNow	Air quality forecasting website run by EPA
Air Toxics	Suite of parameters that includes VOCs, carbonyls, PAHs and metals
AMoN	Ammonia Monitoring Network
AQI	Air Quality Index
AQS	Air Quality System; EPA's repository of ambient air quality data
BioWatch	Biological agents network operated by the Department of Homeland Security
CAA	Clean Air Act
CAS	Chemical Abstracts Service
CASTNET	Clean Air Status and Trends Network
CBSA	Core Base Statistical Area
CFR	Code of Federal Regulations
CO	Carbon monoxide
Criteria Pollutants	The six pollutants regulated by the 1970 Clean Air Act (particulate matter, ozone, nitrogen dioxide, sulfur dioxide, carbon monoxide, and lead)
CSN	Chemical Speciation Network
DNR	Wisconsin Department of Natural Resources
EOM	Enhanced ozone monitoring
EPA	United States Environmental Protection Agency
ERG	Eastern Research Group, Inc. laboratory
FCPC	Forest County Potawatomi Community
FEM	Federal Equivalent Method
FRM	Federal Reference Method
GC/MS	Gas Chromatography/Mass Spectrometry
HAP	Hazardous Air Pollutant
Hg	Mercury
ICP-MS	Inductively coupled plasma mass spectrometry
LADCO	Lake Michigan Air Directors Consortium
LC	Local Conditions
MDN	Mercury Deposition Network
$\mu g/m^3$	Microgram per cubic meter, unit of measurement
MOA	Memorandum of Agreement
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standard
NADP	National Atmospheric Deposition Program
NATTS	National Air Toxics Trends Stations
NCore	National Core Monitoring Network
NH_3	Ammonia
NO	Nitric oxide
NO_2	Nitrogen dioxide
NO_X	Oxides of nitrogen
NO_Y	Reactive oxides of nitrogen
NPAP	National Performance Audit Program
NTN	National Trends Network

Terms	Definition
O_3	Ozone
PAH	Polycyclic Aromatic Hydrocarbon
PAMS	Photochemical Assessment Monitoring Stations
Pb	Lead
PEP	Performance Evaluation Program
PFAS	Perfluoroalkyl and polyfluoroalkyl substances
$PM_{2.5}$	Particulate matter which has an aerodynamic diameter less than 2.5 microns (fine particulate matter)
PM_{10}	Particulate matter which has an aerodynamic diameter less than 10 microns
$PM_{10-2.5}$	Particulate matter which has an aerodynamic diameter between 2.5 and 10 (coarse particulate matter)
ppb	Parts Per Billion
ppm	Parts Per Million
PQAO	Primary Quality Assurance Organization
PUF	Polyurethane foam
QAPP	Quality Assurance Project Plans
QA/QC	Quality Assurance/Quality Control
QMP	Quality Management Plan
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Stations
SO_2	Sulfur dioxide
SPM	Special Purpose Monitoring
STN	Speciation Trends Network
STP	Standard temperature and pressure
T640	$PM_{2.5}$ FEM using light scatter spectroscopy
T640X	$PM_{2.5}/PM_{10}$ FEM using light scatter spectroscopy
TIP	Tribal Implementation Plan
TO-11A	EPA method for analyzing carbonyls using high performance liquid chromatography
TO-13	EPA method for analyzing PAHs using GC/MS
TO-15A	EPA method for analyzing VOCs using GC/MS
tpy	Tons Per Year
TSP	Total Suspended Particulate matter
TTP	Through the Probe
UATM	Urban Air Toxics Monitoring
UATS	Urban Air Toxics Strategy
USFS	United State Forest Service
VOC	Volatile Organic Compound
WSLH	Wisconsin State Lab of Hygiene
XAD	A resin using in PAH sampling

Introduction

The Wisconsin Air Monitoring Network Plan is an annual report required under the 40 CFR 58 § 58.10(a)(1). Effective July 1, 2007, state and local agencies are required to submit an annual network plan of State and Local Air Monitoring Stations (SLAMS), National Core Monitoring Network (NCore), Speciation Trends Network (STN) sites, Chemical Speciation Network (CSN) sites, Special Purpose Monitoring (SPM) sites and Photochemical Assessment Monitoring Stations (PAMS) sites, if they exist. The plan must include a statement of the purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of 40 CFR Part 58 Appendices A, C, D, and E. In addition, the plan is due annually by July 1 and must be made available to the public for at least 30 days prior to its submission to EPA. Any modifications outlined in the plan are subject to approval of the EPA Regional Administrator, who shall approve or disapprove the plan within 120 days of submission.

The goals of this plan are to demonstrate that the DNR air monitoring network meets current federal monitoring requirements, to detail any changes proposed for the 18 months following publication, to provide specific information on each of the DNR's existing and proposed monitoring sites, and to provide the opportunity for the public to comment on air monitoring activities conducted by the DNR. The plan also includes information on known industrial monitoring activities and information on air toxics monitoring in the state.

The DNR's air quality monitoring data are used to determine compliance with National Ambient Air Quality Standards (NAAQS). In 1970, the CAA established NAAQS for six pollutants known to cause harm to human health and the environment. The CAA requires the DNR to monitor these pollutants, called criteria pollutants, and report the data to the EPA. The criteria pollutants are particulate matter, lead (Pb), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and carbon monoxide (CO). The DNR monitors criteria pollutants to meet federal requirements.

Network Overview

The DNR along with its tribal partners in the DNR Primary Quality Assurance Organization (PQAO) operate 37 fixed ambient air monitoring sites throughout Wisconsin. One or more criteria pollutants are measured at all of these sites. Sites are categorized into three networks with 33 SLAMS, two SPM sites and two tribal sites. Monitoring sites often serve a purpose beyond the criteria pollutants network. Table 2 and Figure 1 show the sites operated by DNR and DNR’s PQAO partners and the networks in which they are included. Table 3 shows the parameters that are monitored at each site. Table 4 shows the methods and equipment used in the DNR monitoring network. Network changes implemented since the publishing of 2023 Annual Network Plan are summarized in Table 1. Proposed network changes for the May 1, 2023 through December 31, 2024 time period are found in summary format on page 43. The BioWatch network includes operation of a network of samplers in a defined area and industrial monitoring is conducted to satisfy state permit conditions; BioWatch and industrial networks are not included in these references.

Table 2: Site Information – Wisconsin Sites Active in May 2023

Site name	AQS Site ID	County	Address	City	Latitude	Longitude	Year Established
Appleton AAL	55-087-0009	Outagamie	4579 N. Meade Street AAL Building	Appleton	44.30738	-88.39509	1995
Bad River Tribal School – Odanah	55-003-0010	Ashland	53751 Pine Street	Odanah	46.60234	-90.65615	2002
Bayside	55-079-0085	Milwaukee	601 E. Ellsworth Ln	Bayside	43.18100	-87.90100	1984
Beloit - Converse	55-105-0030	Rock	1501 Ritsher St	Beloit	42.51831	-89.06360	2013
Chiwaukee Prairie Stateline[3]	55-059-0019	Kenosha	11838 First Ct	Pleasant Prairie	42.50472	-87.80930	1987
Columbus	55-021-0015	Columbia	N 1045 Wendt Rd	Columbus	43.31551	-89.10889	1988
Devils Lake Park[5]	55-111-0007	Sauk	East 12886 Tower Rd	NA	43.43510	-89.67979	1995
Eau Claire - DOT Sign Shop	55-035-0014	Eau Claire	5509 Highway 53 South	Eau Claire	44.76249	-91.41445	2011
Elkhorn	55-127-0006	Walworth	3900 County Road NN	Elkhorn	42.66218	-88.48703	2019
Fond Du Lac	55-039-0006	Fond Du Lac	N3996 Kelly Rd	Fond Du Lac	43.68740	-88.42205	1994
Grafton	55-089-0008	Ozaukee	1866 N. Port Washington Rd.	Grafton	43.34317	-87.92087	1991
Green Bay East High[4]	55-009-0005	Brown	1415 East Walnut	Green Bay	44.50729	-87.99344	1971
Green Bay UW	55-009-0026	Brown	UW Green Bay Grounds, E Circle Drive Drive	Green Bay	44.53098	-87.90799	1994
Harrington Beach Park	55-089-0009	Ozaukee	485 Hwy D	Belgium	43.49830	-87.81020	1994
Horicon Wildlife Area[1,4]	55-027-0001	Dodge	1210 N. Palmatory St	Horicon	43.46611	-88.62111	1982
Jefferson – Laatsch	55-055-0009	Jefferson	N4440 Laatsch Ln	Jefferson	43.00340	-88.82830	2013
Kaukauna	55-087-0015	Outagamie	601 Plank Rd	Kaukauna	44.28930	-88.25219	2017
Kenosha - Water Tower[3]	55-059-0025	Kenosha	4504 64th Ave	Kenosha	42.59560	-87.88576	2013
Kewaunee	55-061-0002	Kewaunee	1630 Milwaukee St.	Kewaunee	44.44312	-87.50525	1994
La Crosse - DOT Building	55-063-0012	La Crosse	3550 Mormon Coulee Rd	La Crosse	43.77750	-91.22690	2005
Lake DuBay	55-073-0012	Marathon	1804 Bergen Rd	Bergen	44.70735	-89.77192	1991
Madison University Ave Well #6	55-025-0047	Dane	2757 University Ave	Madison	43.07378	-89.43595	1992
Madison – East[4]	55-025-0041	Dane	2302 Hoard St	Madison	43.10101	-89.35768	1999
Manitowoc Wdlnd Dunes[3]	55-071-0007	Manitowoc	2315 Goodwin Rd	Two Rivers	44.13862	-87.61612	1994
Milwaukee - College Ave. NR[6]	55-079-0056	Milwaukee	1550 W. College Ave	Milwaukee	42.93257	-87.93434	2013
Milwaukee Sixteenth St. Health Center[2,3,4]	55-079-0010	Milwaukee	1337 S. 16th St	Milwaukee	43.01724	-87.93369	1997
Milwaukee UWM UPark[3]	55-079-0068	Milwaukee	4372 N. Humboldt Blvd	Milwaukee	43.09456	-87.90144	2021
Newport Park[3]	55-029-0004	Door	475 Newport Park Rd.	NA	45.23840	-86.99400	1989
Perkinstown	55-119-8001	Taylor	W10746 Cty Rd. M	Taylor	45.20660	-90.59720	1988
Potawatomi	55-041-0007	Forest	Fire Tower Rd	NA	45.56498	-88.80859	2002
Potosi	55-043-0009	Grant	128 Hwy 61, Potosi Township	Potosi	42.69302	-90.69813	1999

Site name	AQS Site ID	County	Address	City	Latitude	Longitude	Year Established
Racine – Payne & Dolan	55-101-0020	Racine	4500 Charles St	Racine	42.77719	-87.79675	2015
Rhinelander Tower	55-085-0996	Oneida	434 High St	Rhinelander	45.64510	-89.41848	1981
Sheboygan – Haven[3]	55-117-0009	Sheboygan	N7563 Hwy 42	Sheboygan	43.81560	-87.79223	2014
Sheboygan Kohler Andre	55-117-0006	Sheboygan	1520 Beach Park Rd	Sheboygan	43.66737	-87.71631	1997
Trout Lake[5]	55-125-0001	Vilas	Trout Lake Nursery, 10810 County Hwy M	Boulder Junction	46.05200	-89.65405	1973
Waukesha - Cleveland Ave.	55-133-0027	Waukesha	1310 Cleveland Ave	Waukesha	43.02012	-88.21505	1989

Monitoring networks

[1] NCore
[2] UATM
[3] EOM
[4] CSN
[5] NADP – operated by DNR
[6] Near Road

Figure 1: 2023 Air Monitoring Sites in Wisconsin

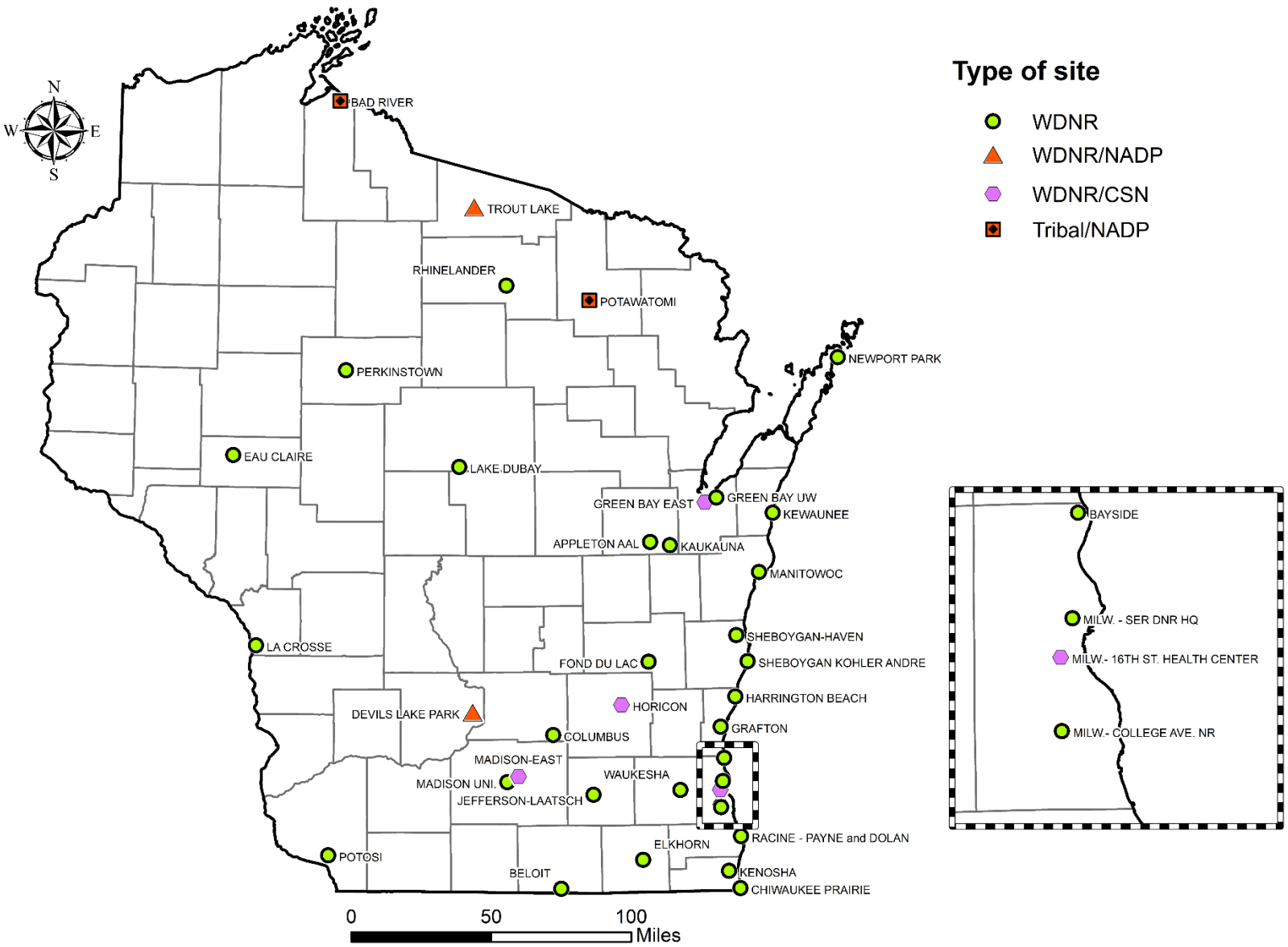


Table 3: 2023 Site Parameters

Site Name	AQS Site ID	County	O_3	$PM_{2.5}$	PM_{10}	$PM_{10-2.5}$	SO_2	NO_2	CO	Meteorological	NO_y	Metals (PM_{10})	VOC-Carbonyl	PAH	Hg (GEM)	CSN	AMoN (DNR)	MDN (DNR)	NTN (DNR)	Aethalometer
Appleton AAL	55-087-0009	Outagamie	S	Cc																
Bad River Tribal School - Odanah	55-003-0010	Ashland	Y	C						Y, RF							Y			
Bayside	55-079-0085	Milwaukee	S																	
Beloit-Converse	55-105-0030	Rock	S																	
Chiwaukee Prairie Stateline	55-059-0019	Kenosha	S	C				S	HS, S	Y, RF			S							
Columbus	55-021-0015	Columbia	S																	
Devils Lake Park	55-111-0007	Sauk	S	C	C	C				Y								Y	Y	
Eau Claire - DOT Sign Shop	55-035-0014	Eau Claire	S	C	C	C				Y										
Elkhorn	55-127-0006	Walworth	S																	
Fond Du Lac	55-039-0006	Fond Du Lac	S																	
Grafton	55-089-0008	Ozaukee	S							S, RF										
Green Bay East High	55-009-0005	Brown		C												Y				
Green Bay UW	55-009-0026	Brown	S																	
Harrington Beach Park	55-089-0009	Ozaukee	S	C						Y										Y
Horicon Wildlife Area	55-027-0001	Dodge	Y	C, F	C, Fc	C	HS		HS	Y, RF	HS		Y			Y				
Jefferson - Laatsch	55-055-0009	Jefferson	S																	
Kaukauna	55-087-0015	Outagamie					Y			Y										
Kenosha - Water Tower	55-059-0025	Kenosha	S							S										
Kewaunee	55-061-0002	Kewaunee	S																	
La Crosse - DOT Building	55-063-0012	La Crosse	S	C																
Lake DuBay	55-073-0012	Marathon	S																	

Site Name	AQS Site ID	County	O_3	$PM_{2.5}$	PM_{10}	$PM_{10-2.5}$	SO_2	NO_2	CO	Meteorological	NO_y	Metals (PM_{10})	VOC-Carbonyl	PAH	Hg (GEM)	CSN	AMoN (DNR)	MDN (DNR)	NTN (DNR)	Aethalometer
Madison University Ave Well #6	55-025-0047	Dane		C	C	C														
Madison - East	55-025-0041	Dane	S	C, F						Y, RF						Y				
Manitowoc Wdlnd Dunes	55-071-0007	Manitowoc	S							S										
Milwaukee - College Ave. NR	55-079-0056	Milwaukee		C	C	C		Y	HS	Y										Y
Milwaukee Sixteenth St. Health Center	55-079-0010	Milwaukee	S	C, F	Fc							Fc	Y		Y	Y				
Milwaukee UWM UPark	55-079-0068	Milwaukee	S				Y	Y		Y										
Newport Park	55-029-0004	Door	S							S										
Perkinstown	55-119-8001	Taylor		C																
Potawatomi	55-041-0007	Forest	Y	C			Y			Y								Y	Y	
Potosi	55-043-0009	Grant		C																
Racine - Payne and Dolan	55-101-0020	Racine	S																	
Rhinelander Tower	55-085-0996	Oneida					Y			Y										
Sheboygan - Haven	55-117-0009	Sheboygan	S							S										
Sheboygan Kohler Andre	55-117-0006	Sheboygan	S							S										
Trout Lake	55-125-0001	Vilas	S	C														Y	Y	
Waukesha - Cleveland Ave.	55-133-0027	Waukesha	S	C, F	C	C				Y										

C – Continuous
F – Federal Reference Method
c – With a collocated monitor of same type
HS – High Sensitivity
RF – Precipitation for National Weather Service
S – Seasonal monitoring
Y – Year-round monitoring

Table 4: Methods and Equipment

Monitoring Parameter	Methods and Equipment	Analyzing Agency
Acid Deposition	Wet-only precipitation collection, Chromatography analysis	NADP
Ammonia	Flow Injection Analysis Colorimetry – Radiello passive samplers	NADP
Black Carbon	Optical attenuation-Magee AE33 Aethalometer	DNR
Carbonyls	High Performance Liquid Chromatography – DNR Canister-Cartridge	WSLH
CO	Gas Filter Correlation – Teledyne API Model T300U	DNR
Mercury (Elemental)	Cold Vapor Atomic Fluorescence Spectrometry – Tekran 2537	DNR
Mercury Deposition	Wet-only precipitation collection, Inductively Coupled Argon Plasma analysis	NADP
Metals	Inductively Coupled Plasma Mass Spectroscopy – Tisch 6070V Hi-Vol sampler for PM_{10} with quartz filters	WSLH
Meteorological Data	Various meteorological sensors	DNR
NO/NOx	Cavity Attenuated Phase Shift Spectroscopy - Teledyne Model N500U	DNR
NO/NO_y trace level	Chemiluminescence – Teledyne API Model T200U	DNR
NO_2	Cavity Attenuated Phase Shift Spectroscopy - Teledyne Model N500 and T500U	DNR
O_3	Ultraviolet Absorption – Teledyne API Models T400	DNR
PAHs	Gas Chromatography/ Mass Spectrometry – Thermo Model PS-1	WSLH
PM_{10} – FEM	Scattered Light Spectroscopy – Teledyne T640X	DNR
PM_{10} – FRM	Gravimetric – Tisch 6070V Hi-Vol sampler for PM_{10} with quartz fiber	WSLH
$PM_{10-2.5}$ – FEM	Scattered Light Spectroscopy – Teledyne T640X	DNR
$PM_{2.5}$ - FEM	Scattered Light Spectroscopy – Teledyne T640 or T640X	DNR
$PM_{2.5}$ - FRM	Gravimetric – Thermo Partisol-Plus Models 2025i or MetOne E-SEQ PM2.5 Sequential Air Samplers	WSLH
$PM_{2.5}$ Speciation - CSN	Gravimetric, GC/MS, Ion Chromatography – MetOne Instruments SASS Speciation Sampler; URG3000N Carbon Samplers	EPA
SO_2	Pulsed Fluorescence – Teledyne API Models T100	DNR
SO_2 trace level	Pulsed Fluorescence – Teledyne API Model T100U	DNR
TSP	Gravimetric – Tisch TE-5070 Hi-Vol samplers	WSLH
VOCs	Gas Chromatography and Mass Spectrometry – DNR Canister-Cartridge	ERG

Minimum Monitoring Requirements

The EPA establishes the minimum number of monitoring sites required to meet national ambient monitoring objectives. The minimum monitoring requirements are codified in Appendix D of 40 CFR Part 58. Minimum monitoring requirements are specific to each individual criteria pollutant (e.g., ozone, PM2.5) or objective based (e.g., NCore, Toxics). Minimum monitoring requirements rely on population, measured concentrations and air pollution emissions data. Wisconsin currently meets all minimum air monitoring requirements. Appendices A and B provide a detailed discussion of these requirements and any applicable waivers.

Monitoring Objectives

Since it is not possible to monitor everywhere in the state, monitoring sites are established according to federal rule to maximize spatial coverage. The concept of spatial scales is used to clarify the link between monitoring objectives and the physical location of the monitor. When designing an air monitoring network one or more of the following six objectives should be determined:

1. Highest concentrations expected to occur in the area covered by the network
2. Representative concentrations in areas of high population density
3. Impact of specific sources on ambient pollutant concentrations
4. General background concentration levels
5. Extent of regional transport among populated areas and in support of secondary standards
6. Welfare-related impacts in the more rural and remote areas

Site Selection

The selection of air monitoring sites is usually based on at least one of these basic monitoring objectives:

- Determine representative concentrations and exposure in areas of high population density
- Determine the highest concentrations of pollutants in an area based on topography and/or wind patterns
- Judge compliance with and/or progress made towards meeting the NAAQS
- Track pollution trends
- Determine the highest concentrations of pollutants within the state based on the known atmospheric chemistry of specific pollutants and wind patterns
- Determine the extent of regional pollutant transport to and from populated areas
- Determine how much various sources impact ambient pollution levels
- Validate control strategies designed to prevent or alleviate air pollution
- Provide a database for research and evaluation of air pollution effects
- Determine general background concentration levels

The exact location of a site is often dependent on the logistics of the area chosen for monitoring, such as considerations of federal siting criteria, access, security and power availability.

Network Scales

The EPA developed a system which specifies an exclusive area or spatial scale that an air monitor represents. The goal in establishing air monitoring sites is to correctly match the spatial scale that is most appropriate for the monitoring objective of the site (Table 5). The representative measurement scales are:

- Microscale (10-100 m) – Defines the concentrations in air volumes associated with area dimensions ranging from several meters up to about 100 meters. Measurements on the micro scale typically include concentrations in street canyons, intersections and areas next to major emission sources.
- Middle Scale (100-1,000 m) – Defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 to 1,000 meters.
- Neighborhood Scale (0.5-4 km) – Defines concentrations within some extended area of the city that has relatively uniform land use with dimensions in the half kilometer to four kilometers range. Generally, these stations represent areas with moderate to high population densities.
- Urban Scale (4-50 km) – Defines the overall, citywide conditions with dimensions on the order of four to 50 kilometers. This scale represents conditions over an entire metropolitan area and is useful in assessing city-wide trends in air quality.
- Regional Scale – Usually a rural area of reasonably homogeneous geography without large sources and extends from tens to hundreds of kilometers.
- National and global scales—These measurement scales represent concentrations characterizing the nation and the globe as a whole.

Table 5: Monitoring Objectives and Associated Network Scales

Monitoring Objective	Appropriate Siting Scales
Highest Concentration	Micro, Middle, Neighborhood (sometimes Urban or regional for secondarily formed pollutants)
Population Exposure	Neighborhood, Urban
Source Impact	Micro, Middle, Neighborhood
General/Background & Regional Transport	Urban, Regional (sometimes Neighborhood)
Welfare-Related Impacts	Urban, Regional

Regional Network Assessment

In addition to the air monitoring network plan, the EPA requires states to complete a network assessment every five years. Under the direction of the Lake Michigan Air Directors Consortium (LADCO), DNR collaborated with other states in the region for network assessments in 2010, 2015 and 2020. The assessment provides a detailed evaluation of the regional air monitoring network. It contains a network history, a re-evaluation of the types of pollutants monitored and an evaluation of the network's objectives and costs. Also, it includes spatial analysis of ambient air monitoring data and a reconsideration of monitor placement based on changes in land use and population. The assessment recommendations provided from LADCO are based on findings from all five states in Region 5. The DNR reviews the assessments to determine which recommendation are applicable to Wisconsin's network.

For the 2020 Network Assessments, DNR collaborated with other EPA Region 5 states. The results of the 2020 Regional Network Assessment can be found on LADCO's website at https://www.ladco.org/reports/monitoring-reports/.

Recommendations of the 2020 Network Assessment

- Criteria pollutant monitoring networks continue to be adequate to meet EPA's minimum monitoring criteria.
- Disinvestment or relocation of existing fine particulate matter ($PM_{2.5}$) which has an aerodynamic diameter less than 2.5 microns and ozone monitoring sites is very difficult due to stringent EPA criteria for shutdown.
- In 2016 EPA removed the Phase 3 population requirement for near road NO_2 monitoring. It is recommended to expand NO_2 monitors to rural and upwind sites in order to capture areas outside the urban sites.
- Since 2015 the population-based lead concentrations levels have been very low resulting in the shutdown of 15 monitors through the region.
- Regionally coordinated field studies would be helpful to better understand the impacts of ozone precursors on ozone concentrations along the lakeshore. Studies could provide data that may be used to update and improve the regulatory meteorological and photochemical models that are used to estimate future ozone values.
- Increased expectation from the public for data has added challenges for agencies that are compounded by the aging and limited support of EPA's AQS databases.

Quality Assurance/Quality Control (QA/QC) Program

The purpose of the QA/QC program is to assure the quality of data obtained from the DNR air monitoring sites. The DNR meets or exceeds the QA requirements defined in 40 CFR 58 and all applicable appendices.

The QA/QC program includes but is not limited to the following activities:

- Instrument performance audits
- Monitor siting evaluations
- Zero, precision and span checks
- Bias and comparability determinations
- Flow rate verifications
- Leak checks
- Data validation
- Data certification

For independent quality assurance activities, the DNR participates in EPA's National Performance Audit Program (NPAP) which includes Through the Probe (TTP) audits and the $PM_{2.5}$ Performance Evaluation Program (PEP) program. Additional inter-laboratory comparisons of performance test and exchange samples are performed periodically for air toxics monitoring.

As the PQAO for two partner organizations in Wisconsin, DNR operates under an EPA approved Quality Management Plan (QMP) and uses Quality Assurance Project Plans (QAPPs) for each statewide monitoring network. The primary purpose of the QAPPs is to provide an overview of the project,

describe the need for the measurements and define QA/QC activities used in the project. All other ambient air monitoring initiatives including state, tribal and industrial projects must have a DNR approved monitoring plan for each specific project.

Annually, the DNR audits each monitoring site to ensure that all applicable EPA siting requirements are fully met. This also includes a safety inspection to assure a safe work environment for staff and that sites are being properly maintained.

Data Processing and Reporting

With the exception of the Special Studies, CSN, mercury (Hg), NADP and BioWatch data, ambient air quality data are stored in a centralized server housed at the Wisconsin Department of Administration.

Continuous pollutant monitoring data are retrieved hourly and posted to DNR's Air Quality website (https://airquality.wi.gov/) and sent to EPA's AirNow web site (https://gispub.epa.gov/airnow/). Continuous data are submitted to EPA's Air Quality System (AQS) after data have been evaluated for quality assurance.

Discrete data (toxics and some particulate matter) collected over 24 hours are submitted to AQS after data have been evaluated for quality assurance.

The federal contract laboratory for CSN is responsible for reporting the results directly to AQS. However, DNR is responsible reviewing the data.

Mercury data not collected as part of NADP are submitted to AQS after data have been processed and evaluated for quality assurance.

BioWatch and NADP data are processed and reviewed by separate national programs and housed within their internal systems.

Criteria Pollutants Network

The DNR monitors criteria pollutants established by the 1970 CAA to show compliance with the NAAQS. The criteria pollutants network serves many additional purposes including public reporting of air quality, determining pollution trends, monitoring specific emissions sources, investigating background conditions and evaluating computer models. The criteria pollutants include particulates ($PM_{2.5}$ and PM_{10}), Pb, O_3, NO_2, SO_2 and CO. The DNR works with adjacent states to meet the criteria pollutant requirements. These cooperative efforts are described in the Memorandums of Agreement (MOAs) found in Appendix C.

The EPA has developed primary and secondary NAAQS for each of the criteria pollutants. Primary standards are set to protect public health, while secondary standards are set to protect the environment and public welfare (i.e., visibility, crops, animals, vegetation, and buildings).

The CAA requires the EPA to review the scientific basis of these standards every five years to ensure

they are protective of public health and the environment. Table 6, found on the EPA website at https://www.epa.gov/criteria-air-pollutants/naaqs-table, describes the NAAQS (as of April 2023).

Table 6: National Ambient Air Quality Standards (NAAQS)

Pollutant		Primary / Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		Primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		Primary and Secondary	Rolling 3 month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		Primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Primary and Secondary	1 year	53 ppb(2)	Annual mean
Ozone (O_3)		Primary and Secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Matter (PM)	$PM_{2.5}$	Primary	1 year	12.0 µg/m^3	Annual mean, averaged over 3 years
		Secondary	1 year	15.0 µg/m^3	Annual mean, averaged over 3 years
		Primary and Secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	Primary and Secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		Primary	1 hour	75 ppb(4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.

(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2)any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Criteria monitor types include:

- SLAMS – largely determined by monitoring requirements for NAAQS comparisons and the needs of monitoring organizations to meet respective tribal implementation plan (TIP) or state implementation plan (SIP) requirements
- SPMs – provide for special studies needed by the monitoring organizations to support TIPs/SIPs and other air program activities; these monitors are not counted towards the monitoring organizations minimum requirements but may be used for regulatory purposes if operated for more than two years
- Tribal – monitors that are operated by tribal partners working within DNR's PQAO
- Industrial – monitors operated by DNR or industrial partners that are in place due to an industry specific federal monitoring requirement

Particulate Matter

Particulate matter is not a single pollutant but rather a mixture of solid particles and liquid droplets distributed among numerous gases that interact with solid and liquid phases. The DNR monitors three different particle fractions including $PM_{2.5}$, particulate matter with an aerodynamic diameter less than 2.5 microns; $PM_{10-2.5}$ a coarse particulate matter with an aerodynamic diameter between 2.5 to 10 microns; PM_{10}, particulate matter with an aerodynamic diameter less than 10 microns. $PM_{2.5}$ and PM_{10} are compared to the NAAQS which EPA can regulate. Total suspended particulate matter (TSP), another size fraction of PM is no longer a regulated pollutant, but the sampling method may be used to collect lead samples. Since Wisconsin is no longer required to operate any lead monitoring sites, the TSP method is currently not used.

On January 15, 2013, EPA finalized the health-based NAAQS for particle pollution. The annual NAAQS for $PM_{2.5}$ was lowered from 15 µg/m^3 to 12 µg/m^3. The $PM_{2.5}$ 24-hour standard was retained at 35 µg/m^3. The PM_{10} 24-hour standard was also retained at 150 µg/m^3. There are currently no air quality standards for $PM_{10-2.5}$. On January 27, 2023, EPA proposed to lower the annual NAAQS for annual $PM_{2.5}$ from 12 ug/m^3 to within the range of 9-10 ug/m^3. EPA also proposed to retain the $PM_{2.5}$ 24-hour standard of 35 µg/m^3 and the PM_{10} standard of 150 µg/m^3.

$PM_{2.5}$ Networks

There are currently 18 $PM_{2.5}$ sites in Wisconsin including two tribal sites (Figure 2). Two types of regulatory $PM_{2.5}$ monitors operate in Wisconsin: filter based Federal Reference Method (FRM) samplers and continuous based Federal Equivalent Method (FEM) analyzers.

The FRM monitors collect a 24-hour mass sample of $PM_{2.5}$ on Teflon filters. The DNR uses FRM monitors to meet collocation requirements for continuous methods in Wisconsin. They sample either once every three days or once every six days. Table 7 summarizes the current sampling frequencies for the FRM monitors. The $PM_{2.5}$ FRM data is for quality assurance purposes. The data can substitute for primary monitors and is comparable to the NAAQS. The DNR submits FRM data to AQS.

The continuous based FEM $PM_{2.5}$ analyzers are Teledyne T640/T640X monitors that collect and report hourly $PM_{2.5}$ concentrations. Hourly $PM_{2.5}$ data are used to demonstrate compliance with the $PM_{2.5}$ NAAQS, calculate the air quality index (AQI) and allow for the protection of public health through forecasts and Air Quality Advisories. Continuous data are reported to the DNR's Air Quality website

(https://airquality.wi.gov/), EPA's AIRNow website (https://gispub.epa.gov/airnow/) and eventually to AQS.

The $PM_{2.5}$ network includes 18 sites where continuous FEMs operate as primary samplers. The DNR, in conjunction with EPA, transitioned to a primary FEM network in January 2019. Four sites continue to operate collocated FRMs for quality assurance purposes (Figure 2).

The $PM_{2.5}$ FEM continuous network has several advantages over the FRM network. Continuous FEMs sample on a daily basis while FRMs are intermittent samplers that typically run every three or six days. Continuous monitoring also allows for real time evaluation of data to assist in the identification of air quality episodes. Finally, continuous $PM_{2.5}$ monitoring provides hourly data that assists in understanding how concentrations vary throughout the day.

Currently, a monitoring site meets the annual $PM_{2.5}$ NAAQS if the three-year average of the annual average $PM_{2.5}$ concentration is less than or equal to 12.0 µg/m^3. Figure 3 shows the average of the 2020 through 2022 annual average $PM_{2.5}$ concentrations at Wisconsin sites and compares them to the standard. Wisconsin averages ranged from 5.3 µg/m^3 at Trout Lake to 9.4 µg/m^3 at Milwaukee 16th Street. Therefore, all sites were below the annual standard.

A site meets the 24-hour $PM_{2.5}$ NAAQS if the 98th percentile of the 24-hour $PM_{2.5}$ concentrations in a year, averaged over three years, is less than or equal to 35 µg/m^3. Figure 4 shows the average of 2020 through 2022, 98th percentile of the daily $PM_{2.5}$ averages at Wisconsin sites and compares them to the standard. Wisconsin averages ranged from 16 µg/m^3 at Trout Lake and Bad River to 24 µg/m^3 at Milwaukee 16th Street. Therefore, all sites are below the 24-hour standard.

Table 7: $PM_{2.5}$ FRM Monitors Sampling Frequencies

Monitoring Site	AQS Site ID	Sampling Frequency
Horicon Wildlife Area	55-027-0001	1 in 3
Madison East	55-025-0041	1 in 6
Milwaukee Sixteenth St. Health Center	55-079-0010	1 in 3
Waukesha - Cleveland Ave.	55-133-0027	1 in 6

Figure 2: 2023 $PM_{2.5}$ Monitoring Sites in Wisconsin

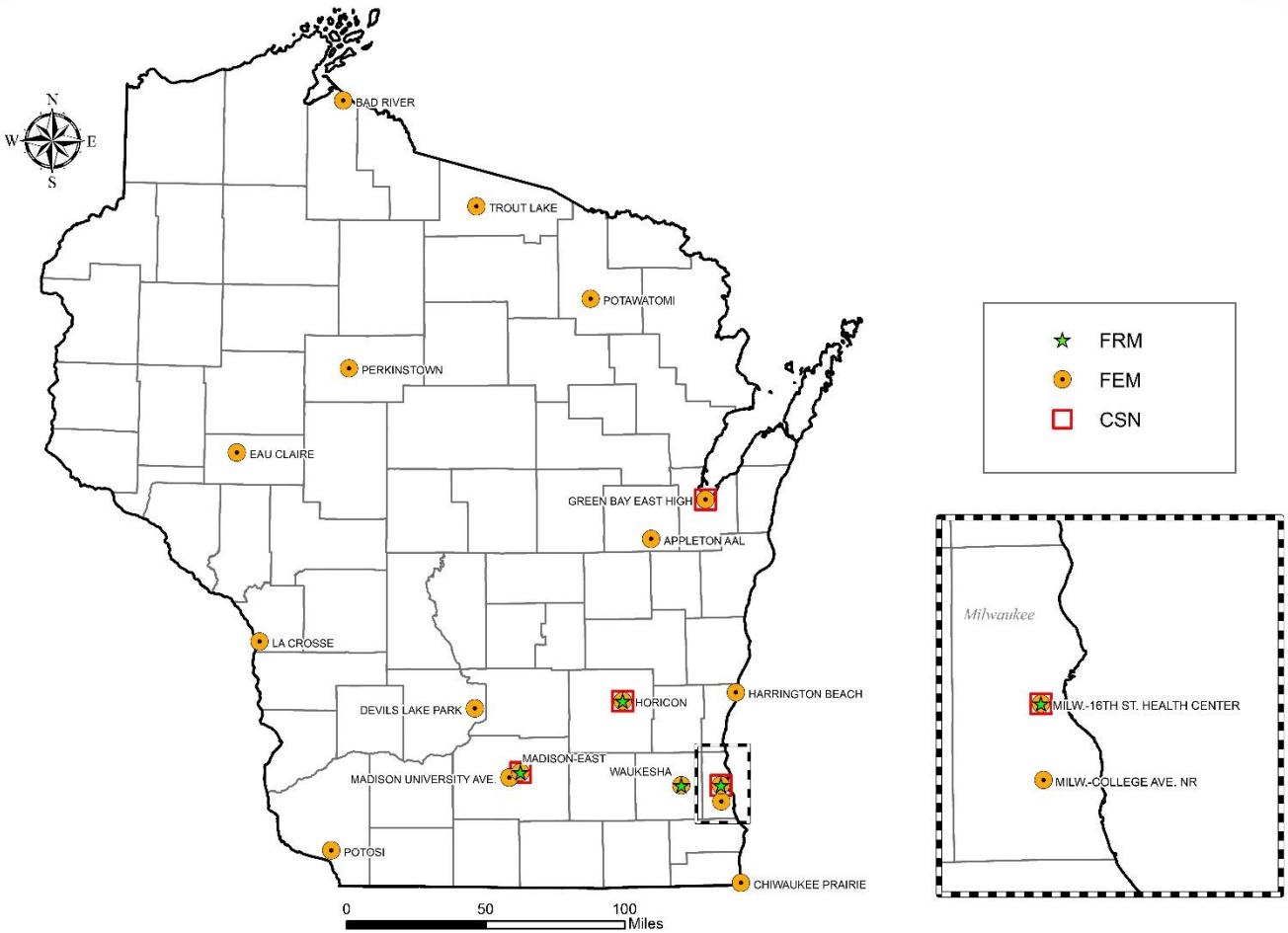


Figure 3: Annual $PM_{2.5}$ 2020-2022 Design Values Compared to the NAAQS

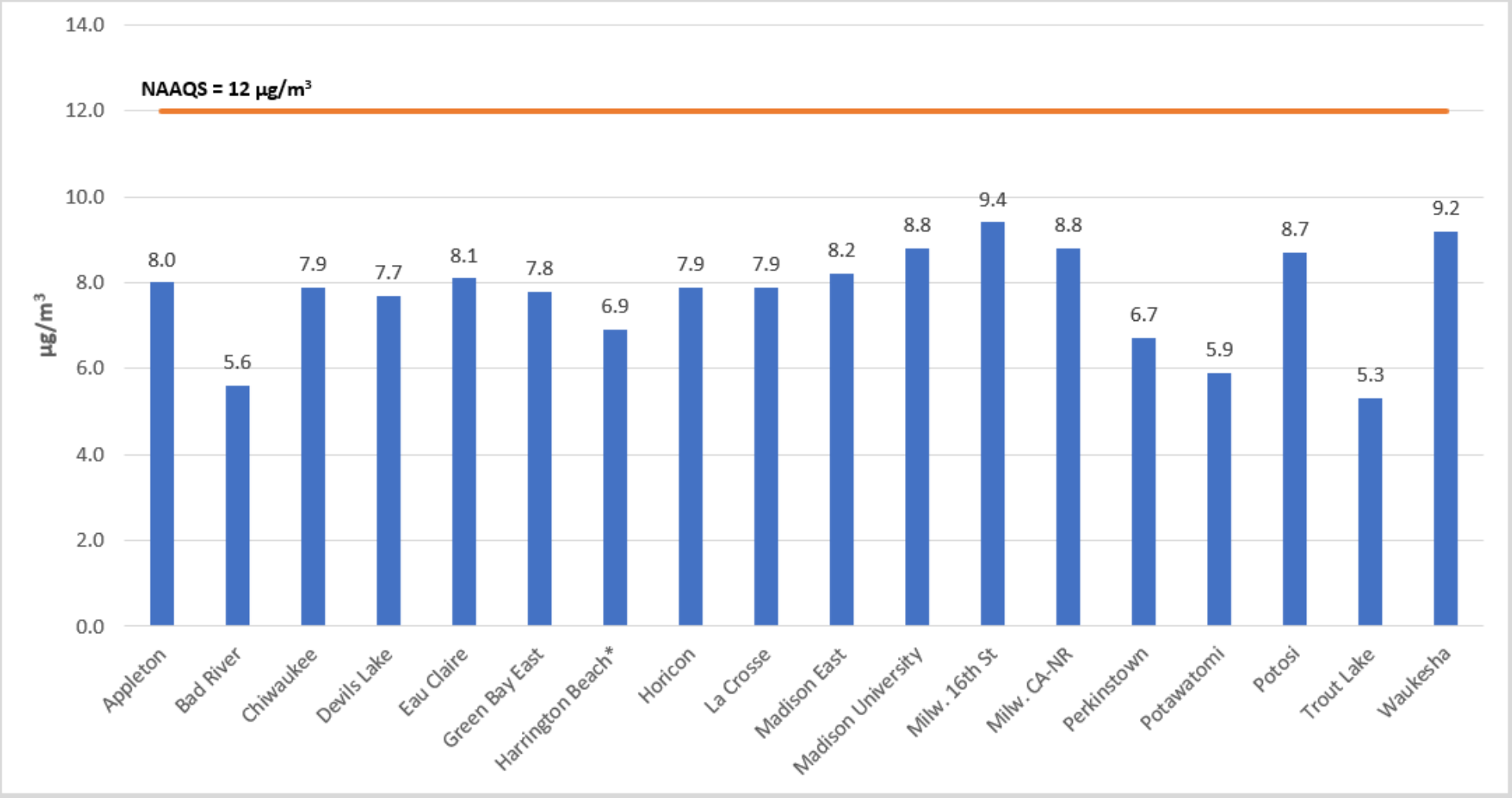
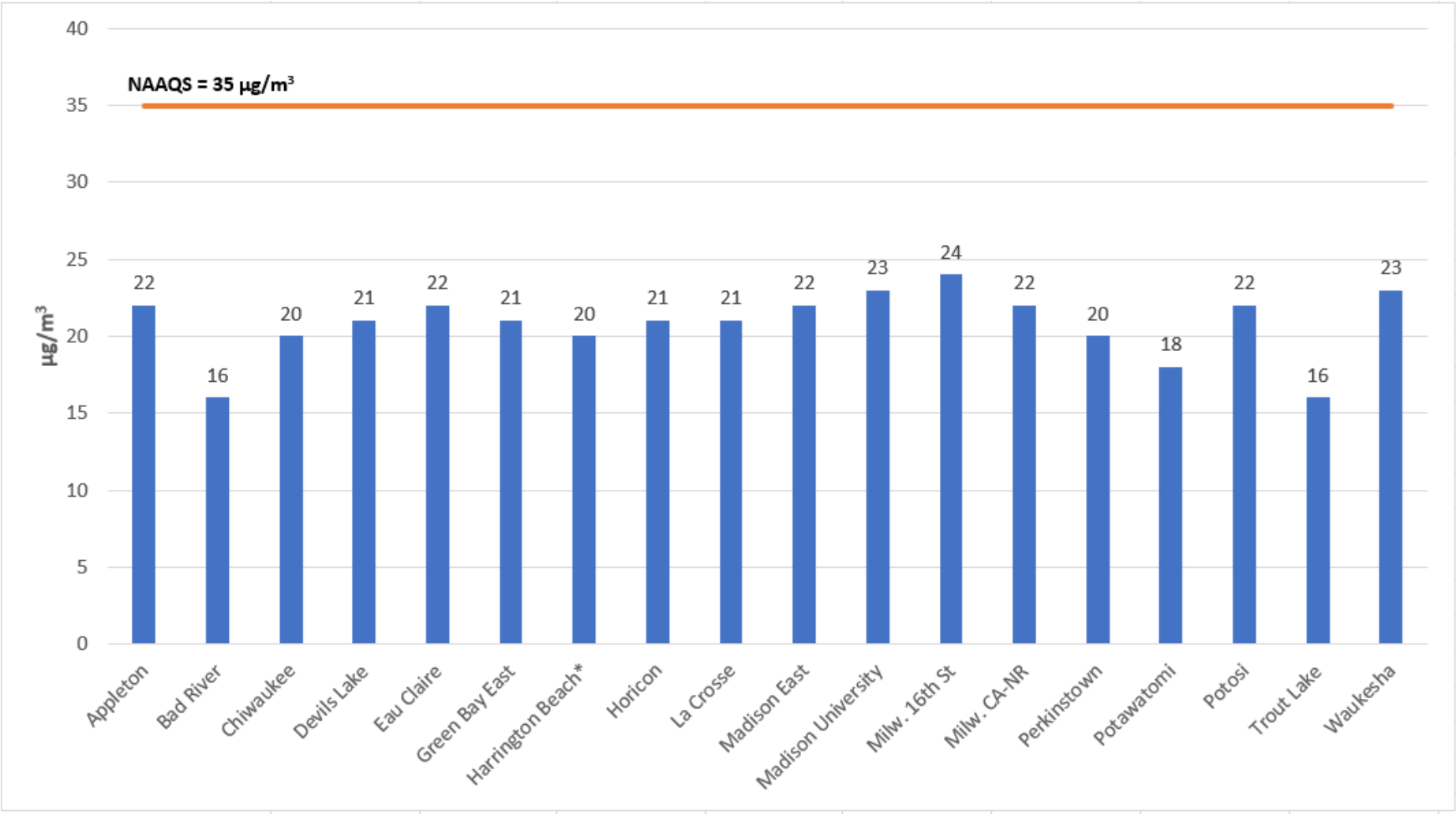


Figure 4: 24-hour $PM_{2.5}$ 2020-2022 Design Values Compared to the NAAQS



*Harrington Beach 2022 data incomplete

$PM_{10\text{-}2.5}$ Network

The national monitoring requirements defined in Appendix D of 40 CFR Part 58 contain a requirement for $PM_{10\text{-}2.5}$ mass monitoring at NCore multipollutant monitoring sites. The DNR monitors for $PM_{10\text{-}2.5}$ at the Horicon NCore site as well as five additional sites (Devils Lake, Eau Claire, Madison University, Milwaukee College Avenue – Near Road and Waukesha) for a total of six sites.

PM_{10} Network

The DNR currently operates PM_{10} FRM monitors at two monitoring sites: Horicon and Milwaukee Sixteenth St. Health Center. The PM_{10} samples are collected over a 24-hour period once every six days.

The DNR also operates continuous PM_{10} FEM monitors that measure hourly PM_{10} concentrations at six sites: Devils Lake, Eau Claire, Horicon Wildlife Area, Madison University, Milwaukee College Avenue – Near Road and Waukesha. At these sites, a monitor measures PM_{10} and calculates concentrations in both local conditions (LC) and at standard temperature and pressure (STP). The LC measurements are appropriate for calculating coarse particulate concentrations but are not appropriate for comparison with the NAAQS. The STP measured values are comparable to the NAAQS.

Figure 5 shows Wisconsin's PM_{10} monitoring sites for 2023.

Wisconsin currently meets applicable NAAQS for PM_{10} at sites with three years of complete data. A monitoring site meets the 24-hour PM_{10} NAAQS when concentrations do not exceed 150 $\mu g/m^3$ more than once per year on average over three years.

To illustrate the daily PM_{10} measurements, Figure 6 shows the 2020-2022 highest daily PM_{10} concentrations at Wisconsin sites. The Wisconsin values ranged from 46 $\mu g/m^3$ at Milwaukee Sixteenth St. Health Center to 89 $\mu g/m^3$ at Milwaukee CA-NR.

Figure 5: 2023 PM_{10} Monitoring Sites in Wisconsin

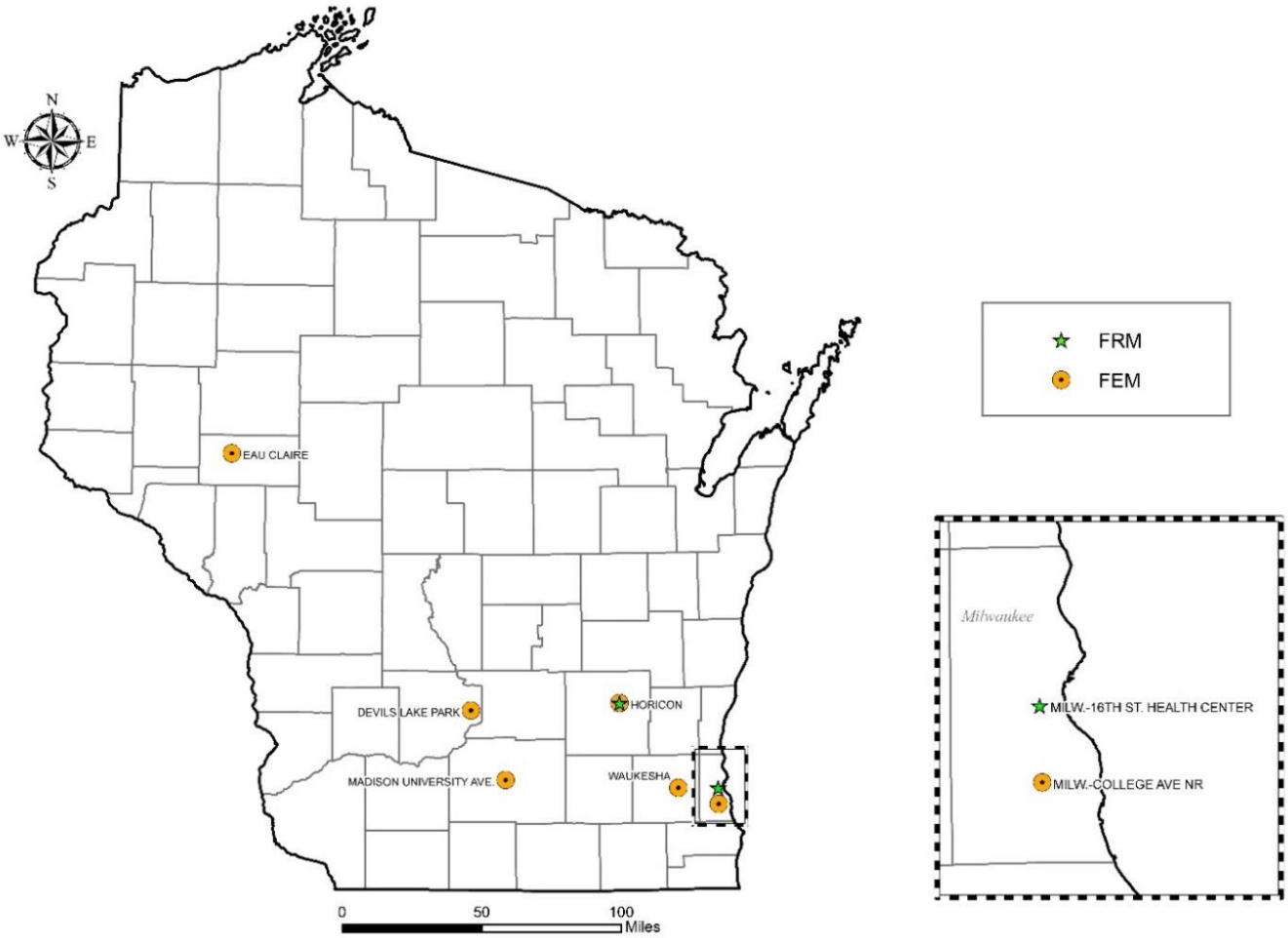
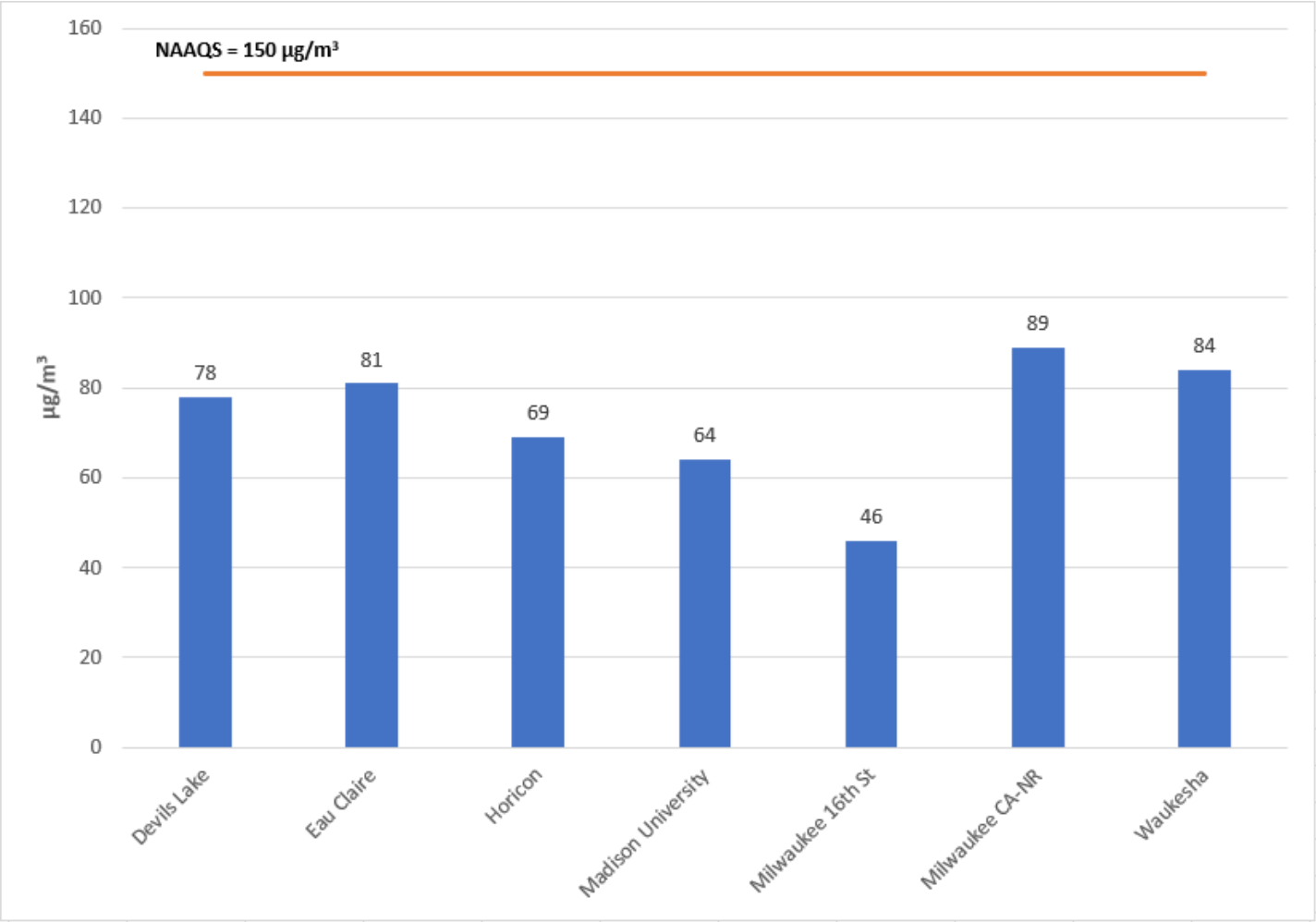


Figure 6: Max 24-hour PM_{10} Concentrations Compared to the NAAQS Based on 2020-2022



Lead (Pb)

Lead is a metal found naturally in the environment as well as in manufactured products. The 2008 Pb NAAQS of 0.15 µg/m^3 for a 3-month period identified one site of interest. The Kohler facility in Sheboygan County monitored from 2010 to 2018 before receiving EPA approval to discontinue monitoring (see waiver in Appendix B). The Wisconsin Air Emission Inventory is reviewed annually to determine if there are facilities with lead emissions that may require monitoring. Table 8 lists current lead monitor emissions from 2017-2021.

Table 8: 2017-2021 Lead Emissions (tons per year)

Facility	FID	County	2017	2018	2019	2020	2021
Ahlstrom-Munskjo NA Specialty Solutions	744008100	Oneida				0.25	0.34
Ardagh Glass Inc	252005930	Racine	0.40	0.35	0.26	0.26	0.27
Kohler Metals Processing Complex	460032870	Sheboygan	0.51	0.32	0.43	0.41	0.46
Milwaukee Valve Company	157061520	Sauk	0.27	0.26	0.26	0.21	0.22
Murphy Concrete and Construction (MCC)	998201820	Winnebago	0.20				
Murphy Concrete and Construction (MCC)	998201820	Winnebago				0.23	0.24
ND Paper Inc - Biron Division	772009480	Wood				0.41	0.026
Rock Road Companies Inc – Monroe Plant	399031820	Rock				0.34	0.39
Scott Construction Inc – Jackson Quarry	157007620	Sauk					0.20
Stark Pavement Corp	399092980	Milwaukee				0.34	0.40
Waupaca Foundry Inc	438041450	Marinette					0.24
Wisconsin Rapids Mill	772010030	Wood				0.24	

Based on the 2021 Wisconsin Air Emission Inventory, no DNR regulated facilities had lead emissions greater than 0.5 TPY, the threshold that may initiate a monitoring requirement. Wisconsin sources that reported lead emissions close to the threshold (>90% (0.45 TPY)) were reminded of the threshold.

Ozone (O_3)

Ozone is an odorless, colorless gas composed of three atoms of oxygen (O_3). Ground-level ozone is not emitted directly into the air but is created through a reaction of oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight.

On October 26, 2015, EPA published its final rule establishing a new 8-hour NAAQS for ozone that set a level of 70 parts per billion (ppb). This rule took effect on December 28, 2015. The rule also included changes to ozone monitoring requirements such as:

- Streamlining and modernizing the PAMS network requirements.
- Changing the length of the ozone monitoring season in Wisconsin.

Because ozone formation typically requires high temperatures and sunny conditions, EPA requires Wisconsin to monitor ozone seasonally with a few exceptions.

- Through 2016, the Wisconsin ozone season spanned April 15 – October 15 excluding Kenosha county sites (Chiwaukee and Kenosha Water Tower) whose season ran from April 1 – October 31.
- In 2017, with the implementation of the 2015 ozone standard, the ozone monitoring season was extended to March 1 through October 15 except for the two Kenosha county sites which monitor for an additional two weeks until October 31.
- In 2018, the EPA granted DNR a waiver to modify the ozone season to April 1- October 15. Approval was based on the three most recent years of March data and over 20 years of historical data from monitors that operate year-round. This waiver excludes Kenosha county sites which will continue to operate March 1 – October 31 to align with the requirements for the Chicago Core Base Statistical Area (CBSA).
- Three sites measure ozone year-round: Bad River Tribal School – Odanah (55-003-0010), Horicon Wildlife Area (NCore) (55-027-0001) and Potawatomi (55-041-0007).

The DNR monitors ozone on a continuous basis at 30 monitoring sites (Figure 7) including two tribal sites. An additional Clean Air Status and Trends Network (CASTNET) monitor located in Perkinstown is operated by the EPA. Since the DNR does not have any role in this monitor, it is not included in the SLAMS or AQI monitoring networks.

The data collected from these 30 monitors are used to determine compliance with the NAAQS and are reported as part of the AQI.

A monitoring site meets the primary ozone NAAQS if the three-year average of the 4th highest daily maximum 8-hour concentration is less than or equal to 70 ppb. Figure 8 shows the 2020 through 2022, design values at Wisconsin sites compared to the standard. Eleven sites had values above the level of the 8-hour standard. The majority of these sites are located near the shore of Lake Michigan.

Figure 7: 2023 Ozone Monitoring Sites in Wisconsin

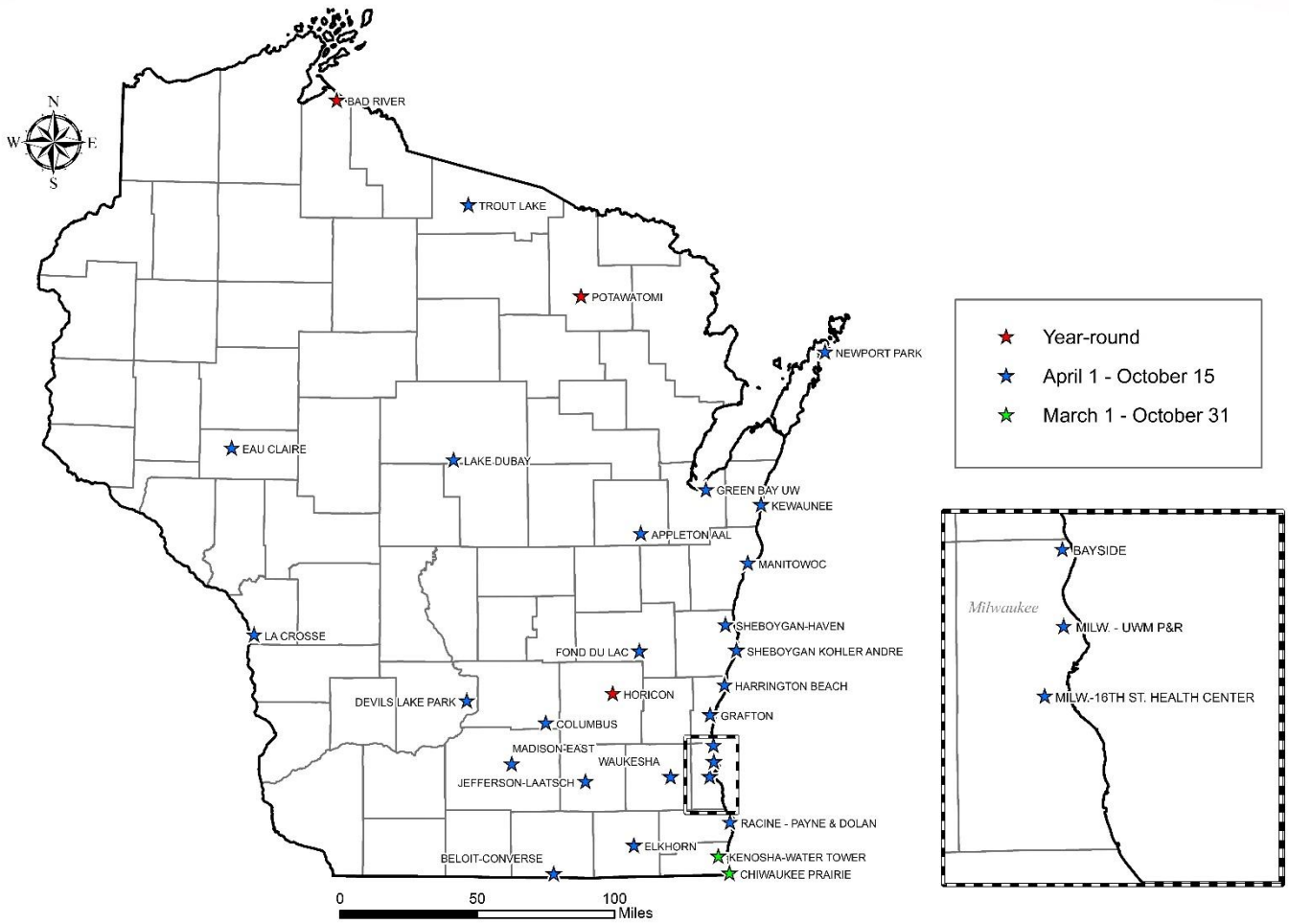
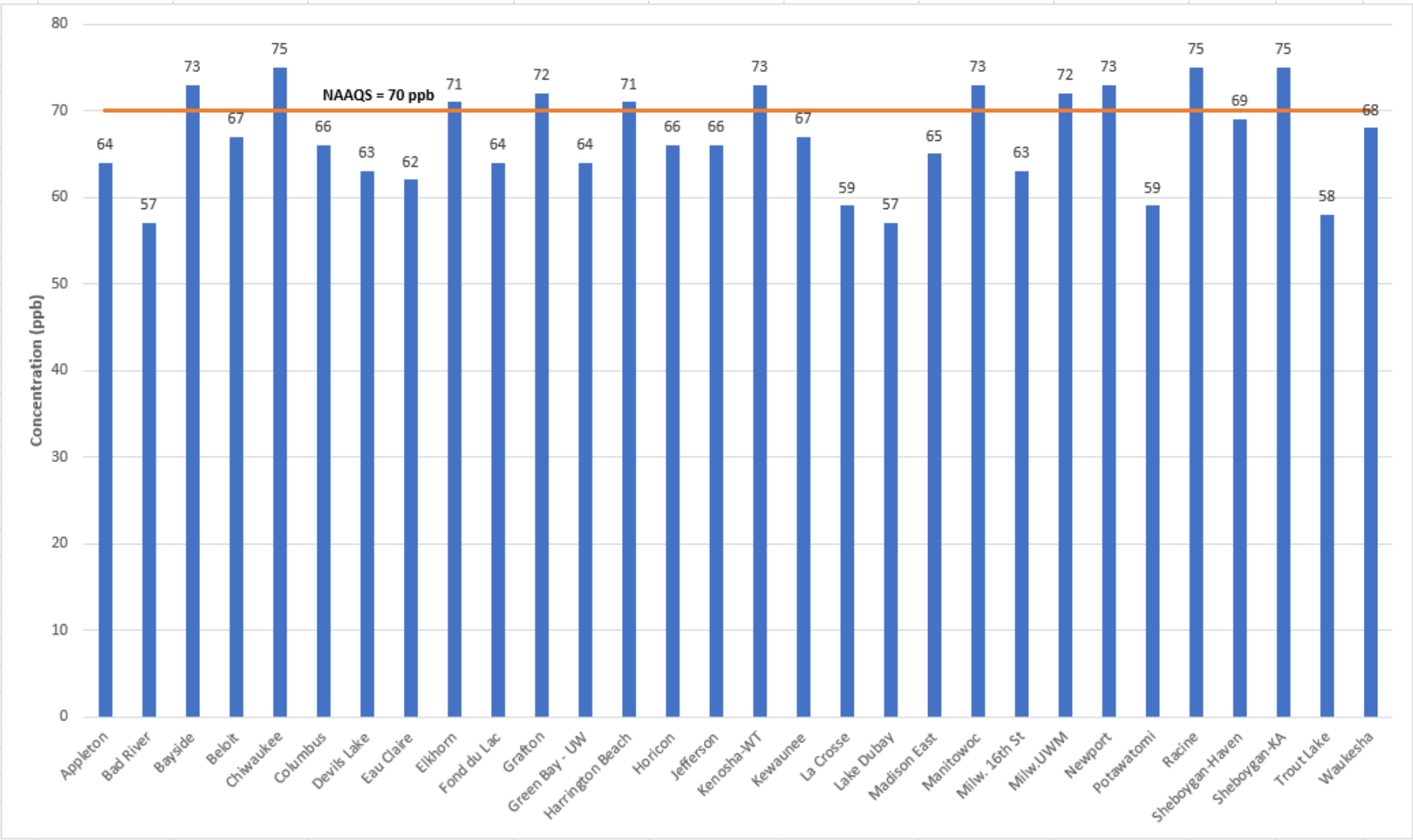


Figure 8: 8-hour Ozone 2020 – 2022 Design Values Compared to the NAAQS



Nitrogen Dioxide (NO_2)

Oxides of nitrogen (NO_x) is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. The two primary components are nitric oxide (NO) and nitrogen dioxide (NO_2). The regulated pollutant is NO_2.

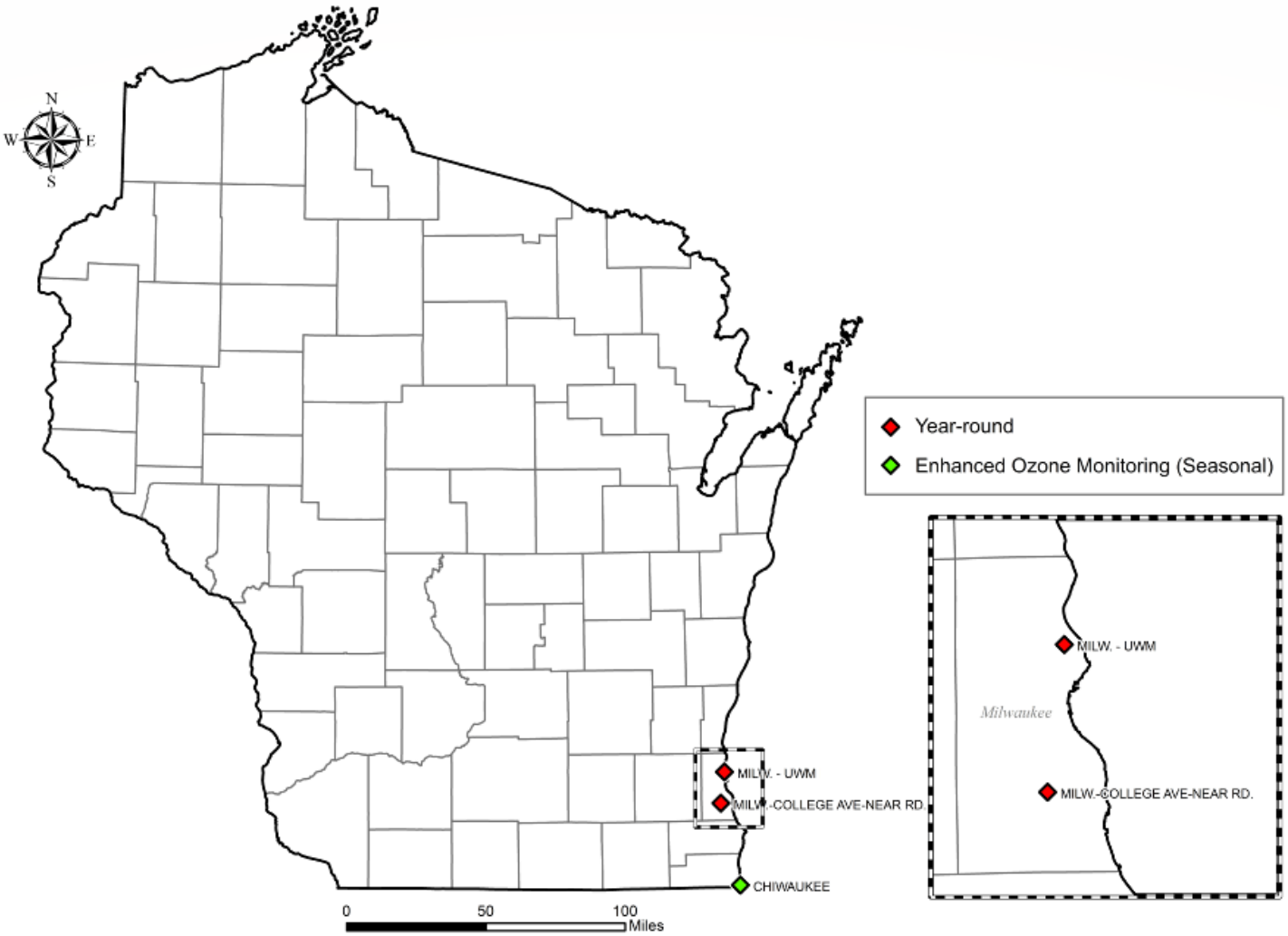
On January 22, 2010, EPA finalized the health-based NAAQS for NO_2 at 100 ppb over a 1-hour averaging period and established new ambient air monitoring and reporting requirements. As part of the standard review process, EPA retained the existing annual NO_2 NAAQS. These standards were most recently retained in a review concluded on April 3, 2012.

The DNR NO_2 criteria network consists of a population-oriented NO_2 monitor located in Milwaukee County at Milwaukee UWM UPark (55-079-0068) and a near road monitor at the Milwaukee – College Ave. NR site (55-079-0056); both sites operate year-round and fulfill Wisconsin's NO_2 monitoring requirement. A seasonal NO_2 monitor is located at Chiwaukee Prairie site (55-059-0019) as part of the Enhanced Ozone Monitoring (EOM) plan. Figure 9 shows the monitoring locations for NO_2 in Wisconsin in 2023. The DNR also monitors NO_Y at Horicon to meet NCORE requirements.

If the annual NO_2 average is less than or equal to 53 ppb, a monitoring site meets the annual NAAQS for NO_2. The Milwaukee UWM UPark (55-079-0068) and the Milwaukee – College Ave. NR site (55-079-0056) monitor for NO_2 year-round and are comparable with the NAAQS. The 2022 annual averages for the two sites are 5.2 ppb and 12.1 ppb. Therefore, Wisconsin currently meets the annual NAAQS NO_2.

To meet the hourly standard, the three-year average of the annual 98th percentile daily maximum 1-hour NO_2 concentration must not exceed 100 ppb. The Milwaukee SER site (55-079-0026) was moved to Milwaukee UWM UPark site in early 2021 making the three-year period incomplete. The Milwaukee UWM UPark site (55-079-0068) and Milwaukee – College Ave. NR site (55-079-0056) monitor for NO_2 year-round and are comparable with the NAAQS. The 2020-2022 averages of the annual 98th percentile daily maximum 1-hour NO_2 concentrations for the two sites are 31 ppb and 41 ppb. Therefore, all Wisconsin sites currently meet the 1-hour NAAQS for NO_2.

Figure 9: 2023 NO_2 Monitoring Sites in Wisconsin



Sulfur Dioxide (SO_2)

Sulfur dioxide (SO_2) belongs to the family of sulfur oxide gases. SO_2 reacts with other chemicals in the air to form sulfate particles. SO_2 is monitored on a continuous basis and reported in hourly and 5-minute increments. Hourly data are used to determine compliance with the NAAQS.

The DNR monitors SO_2 at five sites shown in Figure 10. Trace level SO_2 monitoring at the Horicon NCore site helps researchers understand the role of SO_2 at levels far below the NAAQS. Standard monitoring at background sites such as Potawatomi (rural) and Milwaukee (urban) allow DNR to understand Wisconsin background concentrations relative to NAAQS. Source oriented monitors (Kaukauna and Rhinelander) help regulators and facility managers work together to understand middle-scale impacts.

On June 2, 2010, the EPA finalized revisions to the primary SO_2 NAAQS. EPA established a new 1-hour standard which is met if the three-year average of the annual 99th percentile daily maximum 1-hour SO_2 concentration is less than or equal to 75 ppb. In addition to creating the new 1-hour standard, the EPA revoked the existing 24-hour and annual standards. These standards were most recently retained without revision on March 18, 2019. Figure 11 describes the 2020-2022 average 99th percentile 1-hour SO_2 concentration and compares them to the 1-hour standard. Wisconsin averages ranged from 1 ppb in Potawatomi to 74 ppb in Kaukauna.

EPA made initial area designations for the 2010 1-hour SO_2 NAAQS in stages. Part of Oneida County was designated as nonattainment of the NAAQS in 2013 based on data from the Rhinelander monitor. The EPA finalized approval of a redesignation request for this area to attainment on January 12, 2022.

In December 2017, EPA designated all remaining areas of Wisconsin as attainment/unclassifiable for the NAAQS, with the exception of Outagamie County. In December 2020 EPA made an initial area designation for Outagamie County of nonattainment for this NAAQS based on 2017-2019 data. This designation was updated to attainment/unclassifiable in April 2021 based on 2018-2020 data.

Wisconsin is currently meeting the 2010 SO_2 NAAQS statewide. Wisconsin is required to provide an annual assessment of SO_2 emissions for any areas that were designated in this round based on modeling of actual source emissions; this assessment is included as Appendix G.

Figure 10: 2023 SO_2 Monitoring Sites in Wisconsin

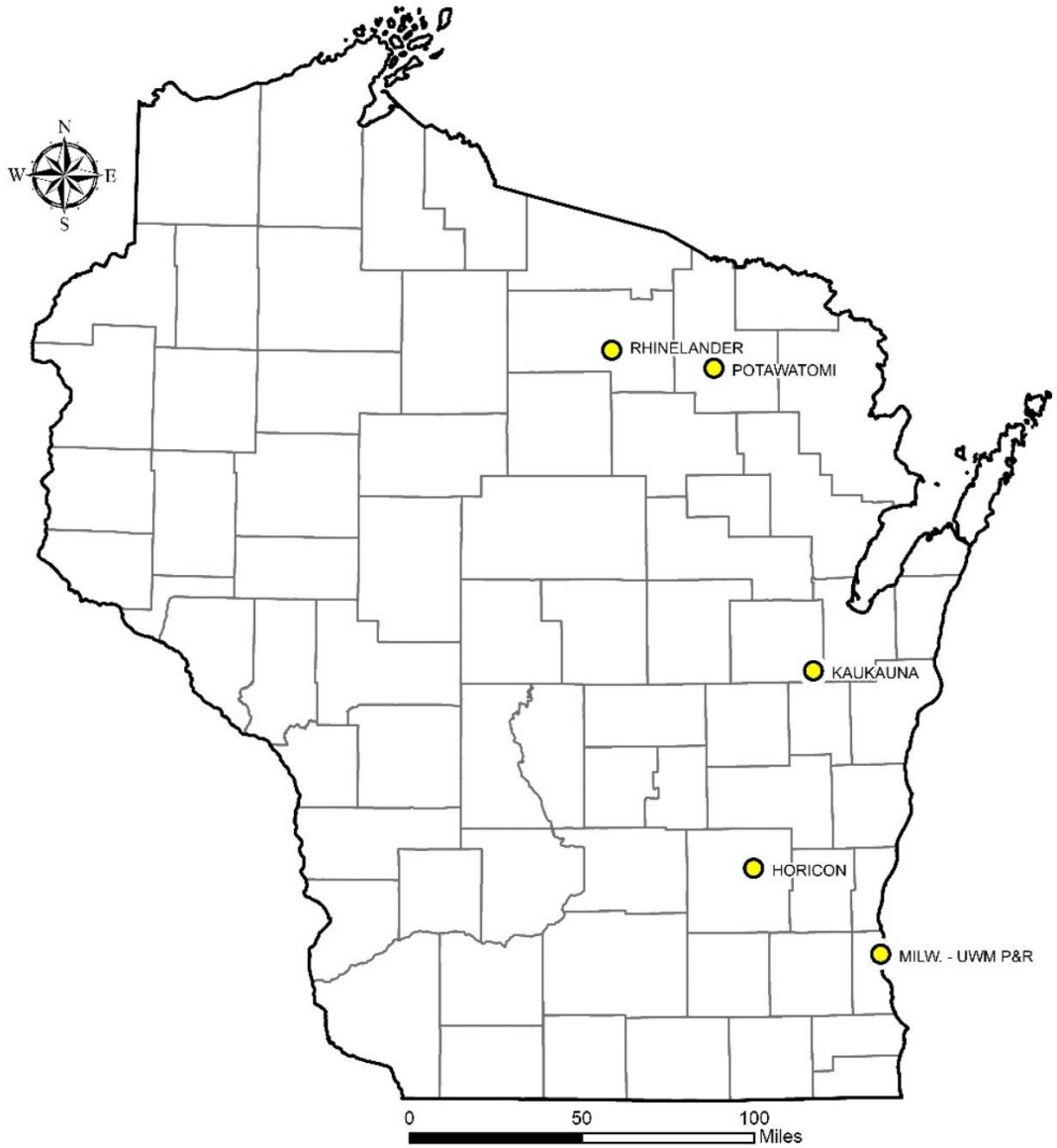
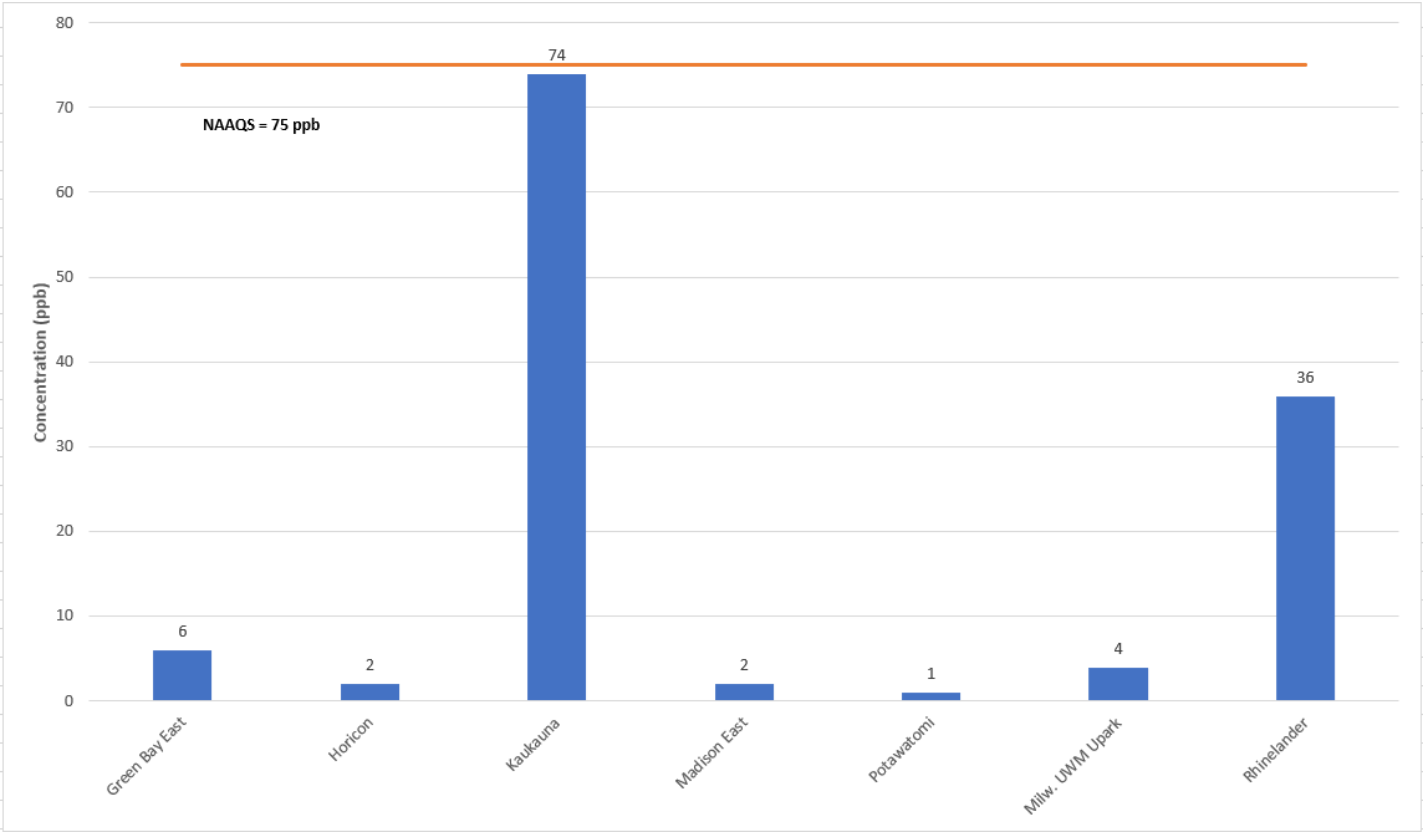


Figure 11: 1-hour SO_2 2020-2022 Design Values Compared to the NAAQS



Carbon Monoxide (CO)

Carbon monoxide is a colorless and odorless toxic gas formed when carbon in fuels is not completely burned. Carbon monoxide is also oxidized to form carbon dioxide (CO_2) which contributes the formation of ground-level ozone.

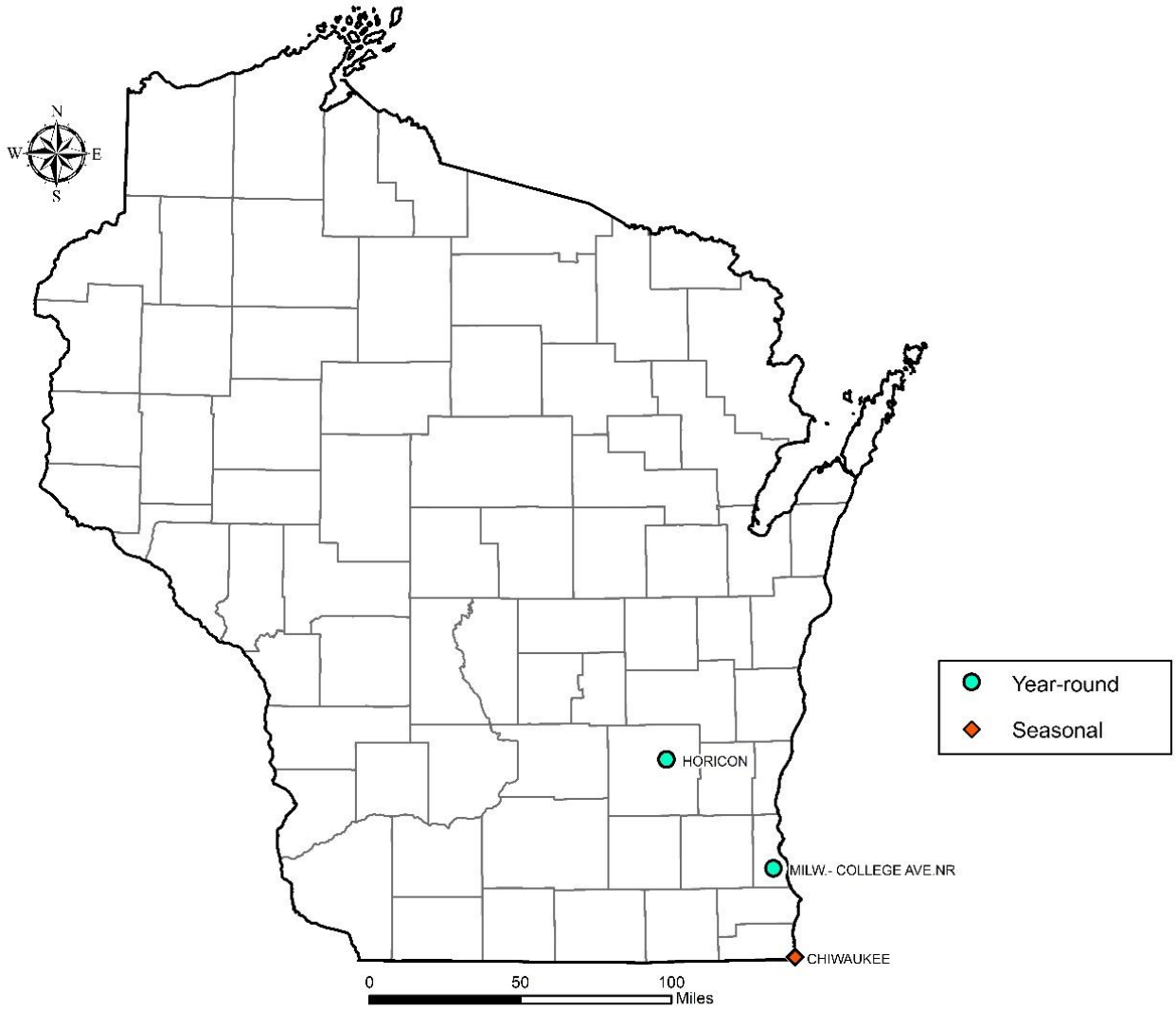
On August 31, 2011, EPA finalized a rule to retain the existing NAAQS for CO and revise the monitoring requirements for CO. The rule required CO monitors to be sited near highly trafficked roads in certain urban areas having a population of 1 million or more. EPA required collocation of these CO monitors with NO_2 near-road monitors. For Wisconsin, this resulted in the requirement to add one CO monitor at the near-road monitoring site in Milwaukee on January 1, 2014.

The DNR monitors CO at two sites in Wisconsin on a continuous basis, data are reported in hourly increments to determine compliance with the NAAQS as well as report to the AQI. Trace level CO analyzers help research partners understand the role of CO at levels far below the NAAQS. The DNR seasonally monitors CO for purposes other than demonstrating compliance with the NAAQS at Chiwaukee. Details are outlined in the EOM network section. See Figure 12.

Currently, Wisconsin meets applicable NAAQS for CO. A monitoring site meets the 8-hour CO NAAQS when the level of 9 parts per million (ppm) is not exceeded more than once per year. The Horicon Wildlife Area (55-027-0001) and the Milwaukee – College Ave. NR (55-079-0056) sites monitor for CO. The 2022 Max 8-hr averages for the two sites are 0.5 ppm and 0.7 ppm.

The 1-hour CO NAAQS is met when the level of 35 ppm is not exceeded more than once per year. The Horicon Wildlife Area (55-027-0001) and the Milwaukee – College Ave. NR (55-079-0056) sites monitor for CO. The 2022 max 1-hr averages for the two sites are 0.96 ppm and 1.1 ppm.

Figure 12: 2023 CO Monitoring Sites in Wisconsin



Non-Criteria Pollutant Networks

National Core Monitoring Network (NCore)

The NCore multi-pollutant sites are part of an overall strategy to integrate multiple monitoring networks and measurements. Each state (i.e. the fifty states, District of Columbia, Puerto Rico, and the Virgin Islands) and some local government entities are required to operate at least one NCore site. Monitors at NCore multi-pollutant sites measure particulates ($PM_{2.5}$, speciated $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$), O_3, SO_2, CO, NOy and basic meteorology.

The NCore objective is to locate sites in broadly representative urban (about 63 sites) and rural (about 17 sites) locations throughout the country to help characterize regional and urban patterns of air pollution. In many cases, monitoring organizations collocate these sites with CSN sites measuring speciated $PM_{2.5}$ components and PAMS sites already measuring ozone precursors. By combining these monitoring programs at a single location, EPA and its partners maximize the multi-pollutant information available. This greatly enhances the foundation for future health studies, NAAQS revisions, validation of air quality models, assessment of emission reduction programs, and studies of ecosystem impacts of air pollution.

Wisconsin's NCore site (Horicon Wildlife Area) is located in Dodge County representing a rural area. High sensitivity NO_y, CO and SO_2 began operating at Mayville located in Dodge County in 2005 and 2006 and moved to Horicon in 2010.

Near-Road Air Quality Monitoring

In 2010, the EPA introduced a new air monitoring network to measure air pollution levels near heavily trafficked roadways. Near-road air monitoring sites are required to be located within 50 meters of the busiest roadways across the country. Near-road monitoring sites are required to measure hourly levels of NO_2, CO and $PM_{2.5}$. On December 30, 2016, EPA finalized "The Revision to Near-Road Ambient Nitrogen Dioxide (NO_2) Monitoring Requirements" which eliminated Phase 3 of this requirement. Phase 3 would have required a second monitoring station in Madison.

In Wisconsin, DNR installed one near-road monitoring site as required. It began operating along the Chicago/Kenosha/Milwaukee corridor near I-94 in Milwaukee on January 1, 2014. Various parameters are being measured at the near-road site (Table 9) to further study PM size fractions in a near-road environment.

Table 9: Near-Road Parameters

Site Name	AQS Site ID	City	CO	NO_2	$PM_{2.5}$ FEM	Other Parameters
Milwaukee - College Ave. NR	55-079-0056	Milwaukee	x	x	x	PM_{10}, $PM_{10-2.5}$, Black Carbon, Meteorological

Air Toxics

Air toxics include, but are not limited to, the 188 Hazardous Air Pollutants (HAPs) specified in the 1990 CAA Amendments and updates (see https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications for a list of HAPs). In 1999, EPA finalized the Urban Air Toxics Strategy (UATS). The UATS states that emissions data are needed to quantify the sources of air toxics impacts and aid in the development of control strategies, while ambient monitoring data are needed to understand the behavior and concentration of air toxics in the atmosphere after they are emitted. Part of this strategy included the development of the NATTS program. The NATTS program measures core air toxics pollutants including VOCs, carbonyls, metals and polycyclic aromatic hydrocarbons (PAHs).

The DNR monitored metals, VOCs, carbonyls and PAHs at Horicon Wildlife Area (55-027-0001) which operated as a rural NATTS site on a one in six day schedule. Due to funding constraints, sampling of PAH's and metals continued through December 2022 and are currently on hold. Sampling of VOCs and carbonyls will continue through 2023 (analysis will be funded by EPA from June 30 – Dec 31st), after which sampling for all NATTS parameters will be put on hold at Horicon. Without adequate funding, DNR cannot support NATTS at Horicon. EPA continues to evaluate the national strategy for NATTS and has committed to continuing to work with DNR to prioritize NATTS funding for Wisconsin in 2024.

Metals, VOCs and carbonyls are also monitored at Milwaukee Sixteenth St. Health Center (55-079-0010) which operates as an Urban Air Toxics (UAT) site on a one in six day schedule. The toxics monitoring sites appear in Figure 13. Analysis of VOC and carbonyl samples collected at the Horicon site by DNR are contracted by EPA's current national contract lab (Eastern Research Group, Inc laboratory). Analysis for the UAT samples collected by DNR are contracted to the Eastern Research Group, Inc laboratory for analysis of VOCs and the Wisconsin State Laboratory of Hygiene (WSLH) for all other analyses.

Metals

Metals are extracted from PM_{10} filters and analyzed using inductively coupled plasma mass spectrometry (ICP-MS) following an EPA method. Table 10 lists the six metals analyzed by WSLH and reported by the DNR. The DNR monitors metals at one site in Wisconsin while the other is on hold. See Figure 13.

Table 10: 2023 Metals Monitored in Wisconsin

Parameter	EPA Parameter Codes
Arsenic (As)	82103
Beryllium (Be)	82105
Cadmium (Cd)	82110
Lead (Pb)	82128
Manganese (Mn)	82132
Nickel (Ni)	82136

VOCs

VOCs for air toxics compounds are collected as whole air samples in evacuated stainless-steel canisters using EPA compendium method TO-15A and analyzed using gas chromatography and mass

spectrometry. Table 11 lists the 59 VOCs analyzed by ERG and reported to AQS by DNR for NATTS and UATM. The DNR monitored VOCs at two sites in Wisconsin. See Figure 13.

Table 11: 2023 VOCs Monitored in Wisconsin

Parameter	CAS #	EPA Parameter Code
1,1,1-Trichloroethane	71-55-6	43814
1,1,2,2-Tetrachloroethane	79-34-5	43818
1,1,2-Trichloroethane	79-00-5	43820
1,1-Dichloroethane	75-34-3	43813
1,1-Dichloroethene	75-35-4	43826
1,2,4-Trichlorobenzene	120-82-1	45810
1,2,4-Trimethylbenzene	95-63-6	45208
1,2-Dibromoethane	106-93-4	43843
1,2-Dichloroethane	107-06-2	43815
1,2-Dichloropropane	78-87-5	43829
1,3,5-Trimethylbenzene	108-67-8	45207
1,3-Butadiene	106-99-0	43218
Acetonitrile	75-05-8	43702
Acetylene	74-86-2	43206
Acrolein	107-02-8	43505
Acrylonitrile	107-13-1	43704
Benzene	71-43-2	45201
Bromochloromethane	74-97-5	43836
Bromodichloromethane	75-27-4	43828
Bromoform	75-25-2	43806
Bromomethane	74-83-9	43819
Carbon Disulfide	75-15-0	42153
Carbon Tetrachloride	56-23-5	43804
Chlorobenzene	108-90-7	45801
Chloroethane	75-00-3	43812
Chloroform	67-66-3	43803
Chloromethane	74-87-3	43801
Chloroprene	126-99-8	43835
cis-1,2-Dichloroethylene	156-59-2	43839
cis-1,3-Dichloropropene	10061-01-5	43831
Dibromochloromethane	124-48-1	43832
Dichlorodifluoromethane	75-71-8	43823

Parameter	CAS #	EPA Parameter Code
Dichloromethane	75-09-2	43802
Dichlorotetrafluoroethane	76-14-2	43208
Ethyl Acrylate	140-88-5	43438
Ethyl tert-Butyl Ether	637-92-3	43396
Ethylbenzene	100-41-4	45203
Ethylene oxide	75-21-8	43601
Hexachloro-1,3-butadiene	87-68-3	43844
m-Dichlorobenzene	541-73-1	45806
Methyl Isobutyl Ketone	108-10-1	43560
Methyl Methacrylate	80-62-6	43441
Methyl tert-Butyl Ether	1634-04-4	43372
m,p-Xylene	108-38-3, 106-42-3	45109
n-Octane	111-65-9	43233
o-Dichlorobenzene	95-50-1	45805
o-Xylene	95-47-6	45204
p-Dichlorobenzene	106-46-7	45807
Propylene	115-07-1	43205
Styrene	100-42-5	45220
tert-Amyl Methyl Ether	994-05-8	43373
Tetrachloroethylene	127-18-4	43817
Toluene	108-88-3	45202
trans-1,2-Dichloroethylene	156-60-5	43838
trans-1,3-Dichloropropene	10061-02-6	43830
Trichloroethylene	79-01-6	43824
Trichlorofluoromethane	75-69-4	43811
Trichlorotrifluoroethane	76-13-1	43821
Vinyl chloride	75-01-4	43860

Due to an EPA requirement to monitor for ethylene oxide (CAS # 75-21-8, EPA Parameter code 43601), NATTS samples from Horicon began special analysis for this compound starting in early 2020. Ethylene oxide analysis at Milwaukee Sixteenth St. Health Center site started in 2021.

Carbonyls

Carbonyls are collected on sorbent tubes using EPA Compendium method TO-11A and are analyzed using high performance liquid chromatography. Table 12 lists Carbonyls analyzed by WSLH/ERG then reported by DNR. The DNR monitored carbonyls at two sites in Wisconsin. See Figure 13.

Table 12: 2023 Carbonyls Monitored in Wisconsin

Parameter	CAS #	EPA Parameter Code
Acetaldehyde	75-07-0	43503
Acetone	67-64-1	43551
Benzaldehyde	100-52-7	45501
Formaldehyde	50-00-0	43502
Hexaldehyde	66-25-1	43517
Isovaleraldehyde	590-86-3	43513
Methyl ethyl ketone	78-93-3	43552
Propionaldehyde	123-38-6	43504
Valeraldhyde	110-62-3	43518

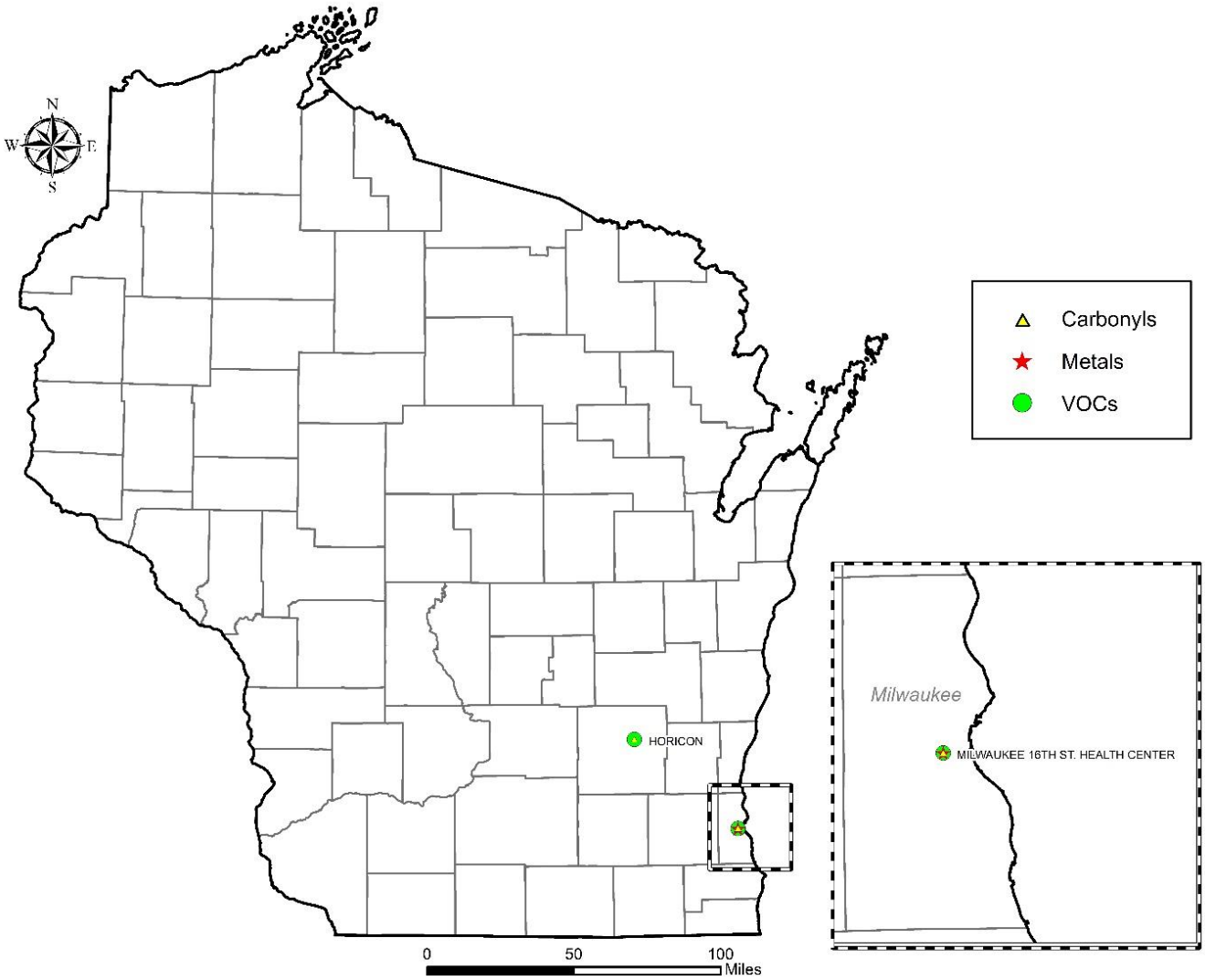
PAHs

PAHs are collected on polyurethane foam (PUF) plug/XAD resin media using EPA compendium method TO-13 and analyzed using gas chromatography and mass spectroscopy. Table 13 lists the 21 PAHs analyzed by WSLH and reported by DNR. The DNR monitored PAHs at one site in Wisconsin; sampling is currently on hold. See Figure 13.

Table 13: 2023 PAHs Monitored in Wisconsin

Parameter	CAS #	EPA Parameter Code
1-Methylnaphthalene	99-12-0	16938
2-Methylnaphthalene	91-57-6	16915
2,7-Dimethylnaphthalene	582-16-1	17140
Acenaphthene	83-32-9	17147
Acenaphthylene	208-96-8	17148
Anthracene	120-12-7	17151
Benzo(a)anthracene	56-55-3	17215
Benzo(a)pyrene	50-32-8	17242
Benzo(b)fluoranthene	205-99-2	17220
Benzo(e)pyrene	50-32-8	17224
Benzo(ghi)perylene	191-24-2	17237
Benzo(k)fluoranthene	207-08-9	17223
Chrysene	218-01-9	17208
Dibenzo(ah)anthracene	53-70-3	17231
Fluoranthene	206-44-0	17201
Fluorene	86-73-7	17149
Indeno(1,2,3-cd)pyrene	193-39-5	17243
Naphthalene	91-20-3	17141
Phenanthrene	85-01-8	17150
Pyrene	129-00-0	17204
Retene	483-65-8	17158

Figure 13: 2023 Air Toxics Monitoring Sites in Wisconsin



Enhanced Ozone Monitoring (EOM) and Photochemical Assessment Monitoring Stations (PAMS)

The chief objective of enhanced ozone monitoring is to provide an air quality database that assists air pollution control agencies in evaluating, tracking the progress of and refining control strategies for attaining the ozone NAAQS. The data helps ensure the implementation of the most effective regulatory controls. An EOM plan is required by federal regulations for ozone nonattainment areas classified as moderate (or above).

On October 26, 2015, EPA published its final 2015 Ozone NAAQS rule. This rule included new PAMS directives that removed the requirement and funding for a PAMS site in Milwaukee. However, this rule also required states with moderate to above 8-hour ozone nonattainment areas to implement an EOM plan describing enhanced ozone and ozone precursor monitoring activities. The DNR's enhanced ozone monitoring plan is outlined in Appendix E.

Chemical Speciation Network (CSN)

The CSN network is an EPA effort to gather data on the chemical composition of $PM_{2.5}$ and to provide a long-term record of the concentration levels of selected ions, metals, carbon species, and organic compounds found in $PM_{2.5}$. The current EPA network consists of approximately 50 STN sites and 100 supplemental sites. CSN data can be useful for assessing trends and developing mitigation strategies to reduce emissions and ambient concentrations.

Currently, there are four CSN sites in Wisconsin: Green Bay East High, Horicon Wildlife Area, Madison East and Milwaukee Sixteenth St. Health Center. In October 2022, CSN monitoring was relocated from a background site at Perkinstown to an urban site at the Madison East site. Madison East also has $PM_{2.5}$ FRM sampler operating on a 1 in 6-day schedule. The Milwaukee Sixteenth St. Health Center site is an STN site which requires a collocated $PM_{2.5}$ FRM sampler operating on a 1 in 3-day schedule. The other sites are considered supplemental sites and do not require collocated samplers for the purpose of CSN. Figure 1 shows the locations of these sites.

National Atmospheric Deposition Program (NADP)

The NADP is a cooperative effort between federal, state, tribal and local governmental agencies, educational institutions, private companies and non-governmental agencies that measures atmospheric pollutants (i.e. acids, nutrients, and base cations) deposited to land and surface water in wet and dry form. NADP consists of five networks: National Trends Network (NTN), Mercury Deposition Network (MDN), Atmospheric Integrated Monitoring Network (AIRMoN), Atmospheric Mercury Network (AMNet) and Ammonia Monitoring Network (AMoN). Data are made available on the NADP website: http://nadp.slh.wisc.edu/. Wisconsin has NTN, MDN and AMoN sites.

In addition to routine NADP analysis, DNR and the WSLH have a Memorandum of Understanding for the collection and analysis of a subset of the NTN samples from established sites for perfluoroalkyl and polyfluoroalkyl substances (PFAS). This study is intended to support PFAS ambient air deposition monitoring and laboratory method development as well as establish deposition background concentrations to potentially inform fate and transport in Wisconsin. Wisconsin's field collection involvement with PFAS concluded in May, 2023.

National Trends Network (NTN)

The purpose of the NTN network is to collect data on the chemistry of precipitation for monitoring of geographical and long-term trends. Seven NTN sites operate in Wisconsin. The DNR operates two NTN sites at Trout Lake and Devils Lake Park. Additionally, five sites operate independent of DNR. The U.S. Forest Service (USFS) operates sites at Spooner and Ashland. EPA operates a site at Perkinstown. Forest County Potawatomi Community (FCPC) operates a site at Potawatomi and WSLH operates a site in Madison. These sites are highlighted in Figure 14.

Site operators follow standard procedures to ensure NTN data comparability and representativeness. Site operators collect and send samples weekly to the designated NTN laboratory, which is WSLH. The WSLH reviews field and laboratory data and delivers all data and information to the NADP office, which applies a final set of checks and resolves remaining discrepancies. The NTN website can be found at http://nadp.slh.wisc.edu/NTN/.

Mercury Deposition Network (MDN)

The MDN measures atmospheric mercury deposition to land and surface water in the form of precipitation. All MDN sites follow standard procedures and have uniform precipitation chemistry collectors and gauges. The objective of the MDN is to provide a nationally consistent survey of mercury in precipitation so that atmospheric loading to surface water can be quantified and long-term changes can be detected. Five MDN sites are in Wisconsin. Two sites are operated by the DNR at Trout Lake and Devils Lake Park. The other three sites are operated by FCPC, WSLH and USFS. See Figure 14.

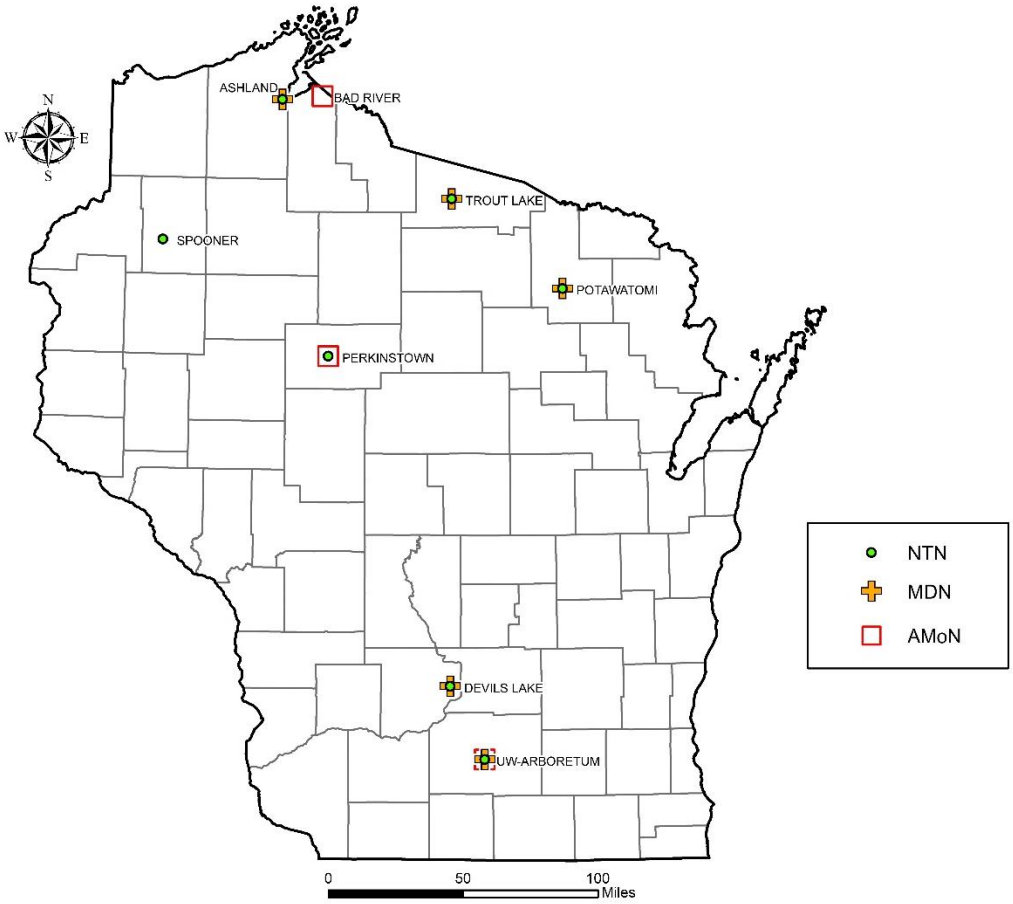
Site operators collect and send samples to the designated MDN laboratory which is WSLH. The WSLH reviews field and laboratory data and delivers all data and information to the NADP Program Office for final checks and resolution of remaining discrepancies. The MDN website can be found at http://nadp.slh.wisc.edu/MDN/.

Ammonia Monitoring Network (AMoN)

The AMoN measures ammonia (NH_3) gas concentrations across the United States. There are three AMoN sites located in Wisconsin. The Perkinstown site is operated by EPA. Bad River is operated by the Bad River tribe and WSLH operates a site in Madison. See Figure 14.

Site operators collect and send samples bi-weekly to the designated AMoN laboratory which is WSLH. The WSLH reviews field and laboratory data and delivers all data and information to the NADP office, which applies a final set of checks and resolves remaining discrepancies. The AMoN website can be found at http://nadp.slh.wisc.edu/AMoN/.

Figure 14: 2023 NADP Sites in Wisconsin



Industrial Monitoring for State Permit Conditions

In Wisconsin, air pollution control permits are required to legally operate certain industrial facilities, to begin construction on new facilities or to modify certain facilities. Air pollution control permits contain state and federal requirements to minimize the adverse impacts of air emissions from these facilities. Some federal programs specify performance standards for certain types of facilities or processes within a facility. Others address the impact of newly constructed facilities or modifications to existing facilities on ambient air quality.

Facilities that are required by state regulations to monitor ambient air quality receive assistance from the DNR through monitoring plan review, siting evaluations, instrument performance audits and data review. These facilities are responsible for operating sampling equipment, sample analysis and additional QA/QC activities. Table 14 lists the current industrial monitoring sites.

Table 14: Industrial Monitoring Sites in Wisconsin

Facility*	AQS Site ID	County	Pollutants
MetalTek International Wisconsin Centrifugal	55-133-0039	Waukesha	TSP
Smart Sands – Blair	55-121-1004	Trempealeau	PM_{10}
Smart Sands – Hixton	55-053-1002	Jefferson	PM_{10}
Smart Sands – Oakdale	55-081-1001	Monroe	PM_{10}
Wisconsin Proppants - Hixton	55-053-1003	Jefferson	PM_{10}

* Industrial monitoring sites may start up or shut down in 2023-2024 as warranted by permits issued/updated and variances granted.

BioWatch

BioWatch, operated through the Department of Homeland Security, is an early warning system designed to detect the release of biological agents in the air through a comprehensive protocol of monitoring and laboratory analysis. The program was designed to demonstrate the effectiveness of new technology in protecting public health. Given the nature of the program, few details are available publicly.

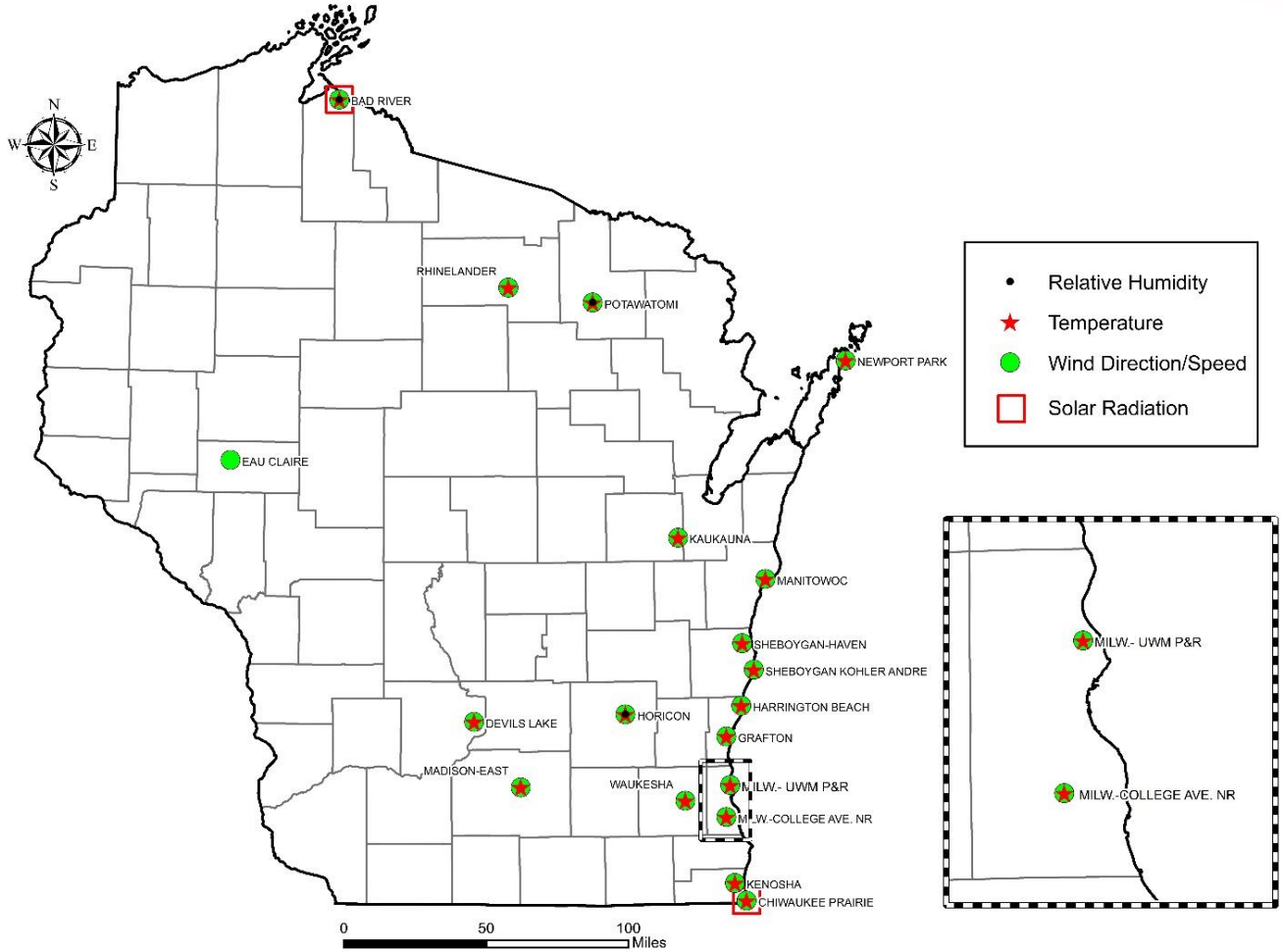
The goals of BioWatch are to:

- Provide early warning of a biological attack by expeditiously identifying the bio-agent, thereby, minimizing casualties in the affected area.
- Assist in establishing forensic evidence on the source, nature and extent of a biological attack to aid law enforcement agents in identifying the perpetrators.

Meteorological Data

Air pollution concentrations are strongly influenced by atmospheric conditions. Meteorological data can be an important tool for understanding and interpreting concentration data. The DNR collects hourly wind speed and wind direction data at 19 sites and temperature data at 18 sites, including two tribal sites. Barometric pressure, relative humidity and solar radiation data are collected at a few sites. See Figure 15 for details.

Figure 15: 2023 Meteorological Sites in Wisconsin



Network Changes

Changes to the DNR Air Monitoring Network are intended to improve the effectiveness of monitoring efforts, ensure compliance with the EPA National Ambient Air Monitoring Strategy and leverage resources to ensure the strategy can be facilitated in Wisconsin. Some changes are planned well in advance and are detailed in the Network Plan each year. This section of the document contains all changes that are planned for May 1, 2023 through December 31, 2024. In Appendix F, the planned and actual changes from the 2023 network plan are detailed.

Some changes cannot be anticipated and are due to unforeseen circumstances including severe weather, legislation, administrative directives, land-use and ownership changes, loss of funding, enforcement actions or complaints. If resources are available and state law is satisfied, DNR will attempt to revive the impacted site. If the site must be moved, DNR will attempt to find a nearby location satisfying all siting criteria that can replace the problematic site.

Proposed Network Changes (May 1, 2023 – December 31, 2024)

Table 15 lists the proposed network changes from May 1, 2023 to December 31, 2024 by parameter network. Details of the proposed changes are presented below.

- Implement EOM Plan per Appendix E
- Contingent on siting and funding:
    - Relocate Perkinstown $PM_{2.5}$ continuous monitor to DNR Lake DuBay site
    - Shutdown Eau Claire $PM_{2.5}$ and PM_{10} Monitors, Trout Lake and LaCrosse $PM_{2.5}$ monitors
- Contingent on funding, the Horicon rural NATTS site may or may not be operational in 2023-2024
    - The DNR monitored metals, VOCs, carbonyls and PAHs at Horicon Wildlife Area (55-027-0001) on a one in six day schedule since 2009.
        - Due to funding constraints, sampling of PAH's and metals continued through December 2022 and are currently on hold. Sampling of VOCs and carbonyls will continue through 2023 (analysis will be funded by EPA from June 30 – Dec 31st), after which sampling for all NATTS parameters will be put on hold at Horicon.
        - Without adequate funding, DNR cannot support NATTS at Horicon. EPA continues to evaluate the national strategy for NATTS and has committed to continuing to work with DNR to prioritize NATTS funding for Wisconsin in 2024.
- DNR may designate $PM_{2.5}$ Federal Reference Method (FRM) data as the primary method and potentially decline submittal and certification of continuous Federal Equivalent Method (FEM) data where FRM/FEM collocations exist.
    - Regulatory $PM_{2.5}$ data includes Federal Reference Method (FRM) and Federal Equivalent Method (FEM) data, both are utilized by air agencies to assess actions needed to attain the NAAQS. The PM2.5 FEM/FRM comparability issues continue to drive the CV UB values to the warning level across the network. The EPA has utilized a process through their reference and equivalency program that allows vendors to update methods in order to improve data alignment with collocated FRMs. In the case of T640/FRM comparability issues, the existing process should be utilized and expedited to ensure FEM comparability and to improve regulatory equipment as technology advances and data becomes more accurate.
    - In lieu of improved data alignment, where air agencies are relying on FEM and FRM data, EPA should offer flexibility in utilizing the FRM data when making regulatory determinations.
- Shutdown and start-up of industrial monitors as needed
- Startup of special purpose monitors and sensors as outlined in American Rescue Plan Community Scale Monitoring grant proposal

Table 15: Proposed Network Changes

May 1, 2023 – December 31, 2024

Monitoring Site	AQS Site ID	Site	Ozone	$PM_{2.5}$	PM_{10}	$PM_{10-2.5}$	SO_2	NO_2	CO	NOy	Meteorological	Metals (PM_{10})	PAH	VOC / Carbonyl	Hg	AmoN	MDN	NTN	CSN
Eau Claire	55-035-0014			T	T	T													
Horicon	55-027-0001										T1			T					
LaCrosse	55-063-0012			T															
Lake Dubay	55-063-0012			A															
Milwaukee UWM UPark	55-079-0068										T1								
Perkinstown	55-119-8001	T		T															
Trout Lake	55-125-0001			T															
Waukesha	55-133-0027										T1								

A = Addition
M = Modification
T = Termination

1 = Barometric Pressure

Appendix A:
Minimum Monitoring Requirements and 2024 Monitor Classifications

Summary

The EPA establishes the minimum number of monitoring sites required to meet national ambient monitoring objectives. The minimum monitoring requirements are codified in Appendix D of 40 CFR Part 58. Minimum requirements are specific to each individual pollutant (e.g., ozone, $PM_{2.5}$) or objective based (e.g., NCore, PAMS) monitoring network. Minimum monitoring requirements typically rely on population and/or air pollution emissions data. Wisconsin currently meets all minimum air monitoring requirements. This appendix provides a detailed description of these requirements, as well as tables that describe each monitor's scale, objective, method, and collocation where required. There are no Prevention of Significant Deterioration (PSD) monitors in Wisconsin.

Federal Regulation

40 CFR § 58.10(a)(1) Beginning July 1, 2007, the state, or where applicable local agency shall submit to the Regional Administrator an annual monitoring network plan which shall provide for the documentation of the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations that can include FRM, FEM, and ARM monitors that are part of SLAMS, NCore, CSN, PAMS, and SPM stations. The plan shall include a statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D, and E of this part, where applicable. The Regional Administrator may require additional information in support of this statement. The annual monitoring network plan must be made available for public inspection and comment for at least 30 days prior to submission to the EPA and the submitted plan shall include and address, as appropriate, any received comments

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Table 28: Methods of DNR and Industrial Sulfur Dioxide Monitors 22

$PM_{2.5}$

Fine Particle ($PM_{2.5}$) Monitoring Requirements

The minimum monitoring requirements for $PM_{2.5}$ are established in Appendix D of 40 CFR Part 58 and are summarized in Tables 1 and 2. In addition to these population-based requirements, $PM_{2.5}$ monitoring is required at NCore and near-road air monitoring sites. Wisconsin currently meets all $PM_{2.5}$ monitoring requirements (see Table 2). Design values (DVs) used in Table 3 are the certified valid 2022 DVs calculated using the AQS AMP480 report generated on April 17, 2023. Scales and objectives of DNR and tribal $PM_{2.5}$ monitors are summarized in Table 4. Scales and objectives of monitors have been updated using current information. In Table 5; sampling frequencies, durations, methods and collocations of DNR and Tribal $PM_{2.5}$ monitors are summarized.

Currently, DNR's primary monitors consist of twelve T640 scattered light spectroscopy Federal Equivalent Method (FEM) analyzers with a method code of 236 and six T640X scattered light spectroscopy FEM analyzers with a method code of 238. The DNR meets the collocation requirements by operating three filter based FRM samplers including two Thermo 2025i FRM sampler with a method code of 145, two Met One ESEQ with a method code of 545 and one FEM T640 with a method code of 236. DNR also operates one Met One ESEQ FRM sampler to meet NCore requirements that does not meet collocation siting. Based on Table 3, the collocation requirements and monitors satisfying them are listed below:

- Three method 236 collocations (25% collocation)
  - 55-025-0041-88101-3 collocated with 55-025-0041-88101-1 (FEM-FRM)
  - 55-079-0010-88101-3 collocated with 55-079-0010-88101-2 (FEM-FRM)
  - 55-087-0009-88101-3 collocated with 55-087-0009-88101-4 (FEM-FEM)
- One method 238 collocation (16.7% collocation)
  - 55-133-0027-88101-3 collocated with 55-0133-027-88101-2 (FEM-FRM)

Table 1: PM2.5 Minimum Monitoring Requirements

MSA Population [1,2]	Most recent 3-year design value ≥ 85% of any PM2.5 NAAQS[3]	Most recent 3-year design value ≤ 85% of any PM2.5 NAAQS[3,4]
> 1,000,000	3	2
500,000 – 1,000,000	2	1
50,000 - < 500,000	1	0

1 = Minimum monitoring requirement applies to the Metropolitan statistical area (MSA).
2 = Population based on latest available census figures.
3 = The $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS) levels and forms are defined in 40 CFR part 50.
4 = These minimum monitoring requirements apply in the absence of a design value.
5 = Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

Table 2: PM2.5 Collocation Requirements Demonstrated Using the Collocation Procedure with a PQAO Having One Type of Primary and Multiple Primary FEMs[1-4]

# Primary FEMS of a unique method designation	# Collocated	# Collocated with a FRM	# Collocated with the same method designation
1 - 9	1	1	0
10 - 16	2	1	1
17 - 23	3	2	1
24 - 29	4	2	1
30 - 36	5	3	2
37 - 43	6	3	3

1 = A primary monitor designated as an EPA FRM shall be collocated with a quality control monitor having the same EPA FRM method designation.
2 = For each primary monitor designated as an EPA FEM used by the PQAO, 50 percent of the monitors designated for collocation, or the first if only one collocation is necessary, shall be collocated with a FRM quality control monitor and 50 percent of the monitors shall be collocated with a monitor having the same method designation as the FEM primary monitor.
3 = If an odd number of collocated monitors is required, the additional monitor shall be a FRM quality control monitor.
4 = A site can only count for the collocation of the method designation of the primary monitor at that site.

Table 3: Wisconsin $PM_{2.5}$ Monitoring Requirements

Metropolitan Statistical Area	2021 Population Estimate	Maximum 2022 Annual DV as % of Standard (12 µg/m³)	Maximum 2022 Daily DV as % of Standard (35 µg/m³)	Minimum Requirement	2022 Sites with FRM or FEM monitor
Chicago-Naperville-Elgin, IL-IN-WI[1]	9,509,934	88	74	3	26
Minneapolis-St.Paul-Bloomington, MN-WI[2]	3,690,512	66	63	2	8
Milwaukee-Waukesha-West Allis, WI[3]	1,566,487	78	69	2	4
Madison, WI[4]	683,183	73	66	1	2
Green Bay, WI[5]	329,490	65	60	0	1
Duluth, MN-WI[6]	290,780	43	54	0	4
Appleton, WI[7]	244,084	67	63	0	1
Racine, WI[8]	196,896	-	-	0	0
Eau Claire, WI[10]	173,317	68	63	0	1
Oshkosh-Neenah, WI[9]	171,623	-	-	0	0
Janesville-Beloit, WI[11]	164,381	-	-	0	0
Wausau, WI[12]	166,189	-	-	0	0
La Crosse-Onalaska, WI-MN[13]	139,211	66	60	0	1
Sheboygan, WI[14]	117,747	-	-	0	0
Fond du Lac, WI[15]	104,362	-	-	0	0
NCore (Horicon)	Not a population based requirement			1	1
Near-road phase 2 (Milwaukee)	Not a population based requirement			1	1

*= Most recent design value year

1 = Counties include: Cook (IL), DeKalb (IL), DuPage (IL), Grundy (IL), Jasper (IN), Kane (IL), Kendall (IL), Kenosha (WI), Lake (IL), Lake (IN), McHenry (IL), Newton (IN), Porter (IN) and Will (IL)

2 = Counties include: Anoka (MN), Carver (MN), Chisago (MN), Dakota (MN), Hennepin (MN), Isanti (MN), Le Sueur (MN), Mille Lacs (MN), Ramsey (MN), Scott (MN), Sherburne (MN), Washington (MN), Wright (MN), Pierce (WI), St. Croix (WI)

3 = Counties include: Milwaukee (WI), Ozaukee (WI), Washington (WI) and Waukesha (WI)

4 = Counties include: Columbia (WI), Dane (WI), Green (WI), Iowa (WI)

5 = Counties include: Brown (WI), Kewaunee (WI), Oconto (WI)

6 = Counties include: Carlton (MN), Lake (MN), St. Louis (MN), Douglas (WI)

7 = Counties include: Calumet (WI), Outagamie (WI)

8 = Counties include: Racine (WI)

9 = Counties include: Winnebago (WI)

10 = Counties include: Chippewa (WI), Eau Claire (WI)

11 = Counties include: Rock (WI)

12 = Counties include: Lincoln (WI), Marathon (WI)

13 = Counties include: Houston (MN), La Crosse (WI)

14 = Counties include: Sheboygan (WI)

15 = Counties include: Fond du Lac (WI)

Table 4: Scales and Objectives of $PM_{2.5}$ Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
APPLETON – AAL	55-087-0009-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Highest Concentration
APPLETON – AAL	55-087-0009-88101-4	SLAMS	PM2.5 - Local Conditions	Urban	Quality Assurance
BAD RIVER TRIBAL SCHOOL – ODANAH	55-003-0010-88101-3	Tribal	PM2.5 - Local Conditions	Regional	General/Background
CHIWAUKEE PRAIRIE STATELINE	55-059-0019-88101-3	SLAMS	PM2.5 - Local Conditions	Regional	Regional Transport
DEVILS LAKE PARK	55-111-0007-88101-7	SLAMS	PM2.5 - Local Conditions	Regional	General/Background
EAU CLAIRE – DOT SIGN SHOP	55-035-0014-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Population Exposure
GREEN BAY EAST HIGH	55-009-0005-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Highest Concentration
HARRINGTON BEACH PARK	55-089-0009-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Regional Transport
HORICON WILDLIFE AREA	55-027-0001-88101-1	SLAMS	PM2.5 - Local Conditions	Regional	General / Background
HORICON WILDLIFE AREA	55-027-0001-88101-3	SLAMS	PM2.5 - Local Conditions	Regional	General / Background
LACROSSE – DOT BUILDING	55-063-0012-88101-3	SLAMS	PM2.5 - Local Conditions	Regional	Highest Concentration
MADISON - UNIVERSITY AVE WELL #6	55-025-0047-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Highest Concentration
MADISON EAST	55-025-0041-88101-1	SLAMS	PM2.5 - Local Conditions	Urban	Quality Assurance
MADISON EAST	55-025-0041-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Population Exposure
MILWAUKEE – COLLEGE AVE. NR	55-079-0056-88101-3	SLAMS	PM2.5 - Local Conditions	Neighborhood	Population Exposure
MILWAUKEE – SIXTEENTH ST. HEALTH CENTER	55-079-0010-88101-2	SLAMS	PM2.5 - Local Conditions	Urban	Quality Assurance
MILWAUKEE – SIXTEENTH ST. HEALTH CENTER	55-079-0010-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Highest Concentration
PERKINSTOWN	55-119-8001-88101-3	SLAMS	PM2.5 - Local Conditions	Regional	General/Background
POTAWATOMI	55-041-0007-88101-3	Tribal	PM2.5 - Local Conditions	Regional	General/Background
POTOSI	55-043-0009-88101-3	SLAMS	PM2.5 - Local Conditions	Regional	Regional Transport
TROUT LAKE	55-125-0001-88101-3	SLAMS	PM2.5 - Local Conditions	Regional	General/Background
WAUKESHA – CLEVELAND AVE	55-133-0027-88101-2	SLAMS	PM2.5 - Local Conditions	Neighborhood	Quality Assurance
WAUKESHA – CLEVELAND AVE	55-133-0027-88101-3	SLAMS	PM2.5 - Local Conditions	Neighborhood	Highest Concentration

Table 5: Sampling Frequencies, Durations, Methods and Collocations of $PM_{2.5}$ monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description	Sample Duration	Collection Frequency	Collocation Primary Monitor Indicator	Distance from Primary Monitor
APPLETON – AAL	55-087-0009-88101-3	SLAMS	236	Light Spectroscopy	1 hour	Every Day	P	n/a
APPLETON – AAL	55-087-0009-88101-4	SLAMS	236	Light Spectroscopy	1 hour	Every Day	C	1.8
BAD RIVER TRIBAL SCHOOL – ODANAH	55-003-0010-88101-3	TRIBAL	236	Light Spectroscopy	1 hour	Every Day	P	n/a
CHIWAUKEE PRAIRIE STATELINE	55-059-0019-88101-3	SLAMS	236	Light Spectroscopy	1 hour	Every Day	P	n/a
DEVILS LAKE PARK	55-111-0007-88101-7	SLAMS	238	Light Spectroscopy	1 hour	Every Day	P	n/a
EAU CLAIRE – DOT SIGN SHOP	55-035-0014-88101-3	SLAMS	238	Light Spectroscopy	1 hour	Every Day	P	n/a
GREEN BAY EAST HIGH	55-009-0005-88101-3	SLAMS	236	Light Spectroscopy	1 hour	Every Day	P	n/a
HARRINGTON BEACH PARK	55-089-0009-88101-3	SLAMS	236	Light Spectroscopy	1 hour	Every Day	P	n/a
HORICON WILDLIFE AREA	55-027-0001-88101-1	SLAMS	545	Gravimetric	24 hours	Every 3rd Day	n/a	n/a
HORICON WILDLIFE AREA	55-027-0001-88101-3	SLAMS	238	Light Spectroscopy	1 hour	Every Day	P	n/a
LACROSSE – DOT BUILDING	55-063-0012-88101-3	SLAMS	236	Light Spectroscopy	1 hour	Every Day	P	n/a
MADISON – UNIVERSITY AVE WELL #6	55-025-0047-88101-3	SLAMS	238	Light Spectroscopy	1 hour	Every Day	P	n/a
MADISON EAST	55-025-0041-88101-1	SLAMS	145	Gravimetric	24 hours	Every 6th Day	C	1.0
MADISON EAST	55-025-0041-88101-3	SLAMS	236	Light Spectroscopy	1 hour	Every Day	P	n/a
MILWAUKEE – COLLEGE AVE. NR	55-079-0056-88101-3	SLAMS	238	Light Spectroscopy	1 hour	Every Day	P	n/a
MILWAUKEE – SIXTEENTH ST. HEALTH CENTER	55-079-0010-88101-2	SLAMS	145	Gravimetric	24 hours	Every 3rd Day	C	3.2
MILWAUKEE – SIXTEENTH ST. HEALTH CENTER	55-079-0010-88101-3	SLAMS	236	Light Spectroscopy	1 hour	Every Day	P	n/a
PERKINSTOWN	55-119-8001-88101-3	SLAMS	236	Light Spectroscopy	1 hour	Every Day	P	n/a
POTAWATOMI	55-041-0007-88101-3	Tribal	236	Light Spectroscopy	1 hour	Every Day	P	n/a
POTOSI	55-043-0009-88101-3	SLAMS	236	Light Spectroscopy	1 hour	Every Day	P	n/a
TROUT LAKE	55-125-0001-88101-3	SLAMS	236	Light Spectroscopy	1 hour	Every Day	P	n/a
WAUKESHA – CLEVELAND AVE	55-133-0027-88101-2	SLAMS	545	Gravimetric	24 hours	Every 6th Day	C	3.5
WAUKESHA – CLEVELAND AVE	55-133-0027-88101-3	SLAMS	238	Light Spectroscopy	1 hour	Every Day	P	n/a

PM_{10}

PM_{10} Monitoring Requirements

The minimum monitoring requirements for PM_{10} are established in Appendix D of 40 CFR Part 58 and are summarized in Table 6. In addition to these population-based requirements, PM_{10} monitoring is required at NCore sites. Currently, Wisconsin meets all PM_{10} monitoring requirements (see Table 6). PM_{10} values used in Table 7 were downloaded from AQS on April 17, 2023 Scales and objectives of DNR and tribal PM_{10} monitors; and industrial monitors are summarized in Tables 8 and 9. Scales and objectives of monitors have been updated using current information. Finally, in Tables 10 and 11; sampling frequencies, durations, methods and collocations of DNR, tribal and industrial PM_{10} monitors are summarized.

Currently, DNR's primary monitors consist of six T640X scattered ligh spectroscopy FEMs with a method code of 238 and one gravimetric FRM sampler with a method code of 141. Collocation requirements for PM_{10} only apply to FRM monitors. At least 15% of the primary FRM monitors must be collocated. The collocated FRMs at Milwaukee 16th St. Health Care Center (55-079-0010) meet this requirement.

- One method 141 collocation (100% collocation)
    - 55-079-0010-81102-1 collocated with 55-079-0010-81102-2 (FRM-FRM)

Table 6: PM_{10} Minimum Monitoring Requirements (number of stations per MSA)[1]

Population Category	High Concentration[2]	Medium Concentration[3]	Low Concentration[4,5]
>1 million	6-10	4-8	2-4
500,000 – 1 million	4-8	2-4	1-2
250,000 – 500,000	3-4	1-2	0-1
100,000 – 250,000	1-2	0-1	0

1 = Selection of urban areas and actual numbers of stations per area within the ranges shown in this table will be jointly determined by EPA and the State Agency.
2 = High concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding the PM_{10} NAAQS by 20 percent or more.
3 = Medium concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding 80 percent of the PM_{10} NAAQS.
4 = Low concentration areas are those for which ambient PM_{10} data show ambient concentrations less than 80 percent of the PM_{10} NAAQS.
5 = These minimum monitoring requirements apply in the absence of a design value.

Table 7: Wisconsin PM_{10} Monitoring Requirements

Metropolitan Statistical Area	2021 Population Estimate	2020-2022 Days greater than 80% of the NAAQS (120 µg/m^3)[16]	Minimum Requirement	2022 Sites
Chicago-Naperville-Elgin, IL-IN-WI[1]	9,509,934	8	4-8	8
Minneapolis-St.Paul-Bloomington, MN-WI[2]	3,690,512	2	4-8	6
Milwaukee-Waukesha-West Allis, WI[3]	1,566,487	0	2-4	3
Madison, WI[4]	683,183	0	0-1	1
Green Bay, WI[5]	329,490	-	0-1	0
Duluth, MN-WI[6]	290,780	0	1-2	2
Appleton, WI[7]	244,084	-	0	0
Racine, WI[8]	196,896	-	0	0
Eau Claire, WI[10]	173,317	-	0	1
Oshkosh-Neenah, WI[9]	171,623	-	0	0
Janesville-Beloit, WI[11]	164,381	-	0	0
Wausau, WI[12]	166,189	-	0	0
La Crosse-Onalaska, WI-MN[13]	139,211	-	0	0
Sheboygan, WI[14]	117,747	-	0	0
Fond du Lac, WI[15]	104,362	-	0	0
NCore (Horicon)	Not a population based requirement		1	1

1 = Counties include: Cook (IL), DeKalb (IL), DuPage (IL), Grundy (IL), Jasper (IN), Kane (IL), Kendall (IL), Kenosha (WI), Lake (IL), Lake (IN), McHenry (IL), Newton (IN), Porter (IN) and Will (IL)
2 = Counties include: Anoka (MN), Carver (MN), Chisago (MN), Dakota (MN), Hennepin (MN), Isanti (MN), Le Sueur (MN), Mille Lacs (MN), Ramsey (MN), Scott (MN), Sherburne (MN), Washington (MN), Wright (MN), Pierce (WI), St. Croix (WI)
3 = Counties include: Milwaukee (WI), Ozaukee (WI), Washington (WI) and Waukesha (WI)
4 = Counties include: Columbia (WI), Dane (WI), Green (WI), Iowa (WI)
5 = Counties include: Brown (WI), Kewaunee (WI), Oconto (WI)
6 = Counties include: Carlton (MN), Lake (MN), St. Louis (MN), Douglas (WI)
7 = Counties include: Calumet (WI), Outagamie (WI)
8 = Counties include: Racine (WI)
9 = Counties include: Winnebago (WI)
10 = Counties include: Chippewa (WI), Eau Claire (WI)
11 = Counties include: Rock (WI)
12 = Counties include: Lincoln (WI), Marathon (WI)
13 = Counties include: Houston (MN), La Crosse (WI)
14 = Counties include: Sheboygan (WI)
15 = Counties include: Fond du Lac (WI)
16 = This count excludes PM_{10} monitoring results from an industrial area of North Minneapolis (27-053-0909 and 27-053-0910)

Table 8: Scales and Objectives of DNR PM_{10} Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
DEVILS LAKE PARK	55-111-0007-81101-3	SLAMS	PM10 Total 0-10 µm STP	Regional Scale	General/Background
EAU CLAIRE DOT	55-035-0014-81101-3	SLAMS	PM10 Total 0-10 µm STP	Urban Scale	Population Exposure
HORICON WILDLIFE AREA	55-027-0001-81102-1	SLAMS	PM10 Total 0-10 µm STP	Regional Scale	General/Background
HORICON WILDLIFE AREA	55-027-0001-81102-2	SLAMS	PM10 Total 0-10 µm STP	Regional Scale	Quality Assurance
HORICON WILDLIFE AREA	55-027-0001-81102-3	SLAMS	PM10 Total 0-10 µm STP	Regional Scale	General/Background
MADISON - UNIVERSITY AVE WELL #6	55-025-0047-81102-3	SLAMS	PM10 Total 0-10 µm STP	Neighborhood	Population Exposure
MILWAUKEE - COLLEGE AVE. NR	55-079-0056-81102-3	SLAMS	PM10 Total 0-10 µm STP	Neighborhood	Population Exposure
MILWAUKEE - SIXTEENTH ST. HEALTH CENTER	55-079-0010-81102-1	SLAMS	PM10 Total 0-10 µm STP	Neighborhood	Population Exposure
MILWAUKEE - SIXTEENTH ST. HEALTH CENTER	55-079-0010-81102-2	SLAMS	PM10 Total 0-10 µm STP	Neighborhood	Quality Assurance
WAUKESHA - CLEVELAND AVE	55-133-0027-81102-3	SLAMS	PM10 Total 0-10 µm STP	Middle Scale	Highest Concentration

Table 9: Scales and Objectives of Industrial PM_{10} Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
Smart Sands – Blair	55-121-1004-81102-1	Industrial	PM10 Total 0-10 µm STP	Middle Scale	Source Oriented
Smart Sands – Hixton	55-053-1002-81102-1	Industrial	PM10 Total 0-10 µm STP	Middle Scale	Source Oriented
Smart Sands – Oakdale	55-081-1001-81102-1	Industrial	PM10 Total 0-10 µm STP	Middle Scale	Source Oriented
Wisconsin Proppants – Alma #1[1]	55-053-1004-81102-1	Industrial	PM10 Total 0-10 µm STP	Middle Scale	Source Oriented
Wisconsin Proppants – Alma #2[1]	55-019-1001-81102-1	Industrial	PM10 Total 0-10 µm STP	Middle Scale	Source Oriented
Wisconsin Proppants – Hixton	55-053-1003-81102-1	Industrial	PM10 Total 0-10 µm STP	Middle Scale	Source Oriented

1 = Monitoring sites currently inactive due to no production at the facility, will start up if/when facility becomes active

Table 10: Sampling Frequencies, Durations, Methods and Collocations of DNR PM_{10} Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description	Sample Duration	Collection Frequency	Collocation Primary Monitor Indicator	Distance from Primary Monitor
DEVILS LAKE PARK	55-111-0007-81102-3	SLAMS	239	Light Spectroscopy	1 hour	Every Day	P	n/a
EAU CLAIRE DOT	55-035-0014-81102-3	SLAMS	239	Light Spectroscopy	1 hour	Every Day	P	n/a
HORICON WILDLIFE AREA	55-027-0001-81102-1	SLAMS	141	Gravimetric	24 hours	Every 6th Day	P	n/a
HORICON WILDLIFE AREA	55-027-0001-81102-2	SLAMS	141	Gravimetric	24 hours	6 per year	C	3.0
HORICON WILDLIFE AREA	55-027-0001-81102-3	SLAMS	239	Light Spectroscopy	1 hour	Every Day	n/a	n/a
MADISON - UNIVERSITY AVE WELL #6	55-025-0047-81102-3	SLAMS	239	Light Spectroscopy	1 hour	Every Day	P	n/a
MILWAUKEE - COLLEGE AVE. NR	55-079-0056-81102-3	SLAMS	239	Light Spectroscopy	1 hour	Every Day	P	n/a
MILWAUKEE - SIXTEENTH ST. HEALTH CENTER	55-079-0010-81102-1	SLAMS	141	Gravimetric	24 hours	Every 6th Day	P	n/a
MILWAUKEE - SIXTEENTH ST. HEALTH CENTER	55-079-0010-81102-2	SLAMS	141	Gravimetric	24 hours	Every 6th Day	C	2.1
WAUKESHA - CLEVELAND AVE	55-133-0027-81102-1	SLAMS	239	Light Spectroscopy	1 hour	Every Day	P	n/a

Table 11: Sampling Frequencies, Durations, Methods and Collocations of Industrial PM_{10} Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description	Sample Duration	Collection Frequency	Collocation Primary Monitor Indicator	Distance from Primary Monitor
Smart Sands – Blair	55-121-1004-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Smart Sands – Hixton	55-053-1002-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Smart Sands – Oakdale	55-081-1001-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Wisconsin Proppants – Alma #1[1]	55-053-1004-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Wisconsin Proppants – Alma #2[1]	55-019-1001-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Wisconsin Proppants – Hixton	55-053-1003-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a

1 = Monitoring sites currently inactive due to no production at the facility, will start up if/when facility becomes active

TSP

TSP Monitoring Requirements

TSP was one of the original NAAQS; however, it was replaced in 1987 by the PM_{10} standard at the national level. In Tables 12 and 13; sampling frequencies, durations, methods and collocations of DNR, tribal and industrial PM_{10} monitors are summarized. Currently, there are no federal requirements to monitor TSP. There is one TSP industrial site located in Waukesha which is the reason for TSP's inclusion in this appendix.

Table 12: Scales and Ojectives of DNR and Industrial TSP Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
MetalTek International - Wisconsin Centrifugal Division	55-133-0039-11101-1	Industrial	Total Suspended Particulate	Middle Scale	Source Oriented

Table 13: Sampling Frequencies, Durations, Methods and Collocations of DNR TSP Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description	Sample Duration	Collection Frequency	Collocation Primary Monitor Indicator	Distance from Primary Monitor
MetalTek International - Wisconsin Centrifugal Division	55-133-0039-11101-1	Industrial	091	Gravimetric	24 hours	Every 6th Day	P	n/a

Lead

Lead Monitoring Requirements

The minimum monitoring requirements for lead are established in Appendix D of 40 CFR Part 58. The lead monitoring requirements are based on annual lead emissions. This source-oriented network requires lead monitoring for non-airport sources which emit 0.5 tons per year and for each airport which emits 1.0 or more tons per year based on either the most recent National Emission Inventory or other scientifically justifiable methods and data.

Based on the 2021 Wisconsin Air Emission Inventory, no DNR regulated facilities had lead emissions greater than 0.5 TPY, the threshold that may initiate a monitoring requirement. Wisconsin sources that reported lead emissions close to the threshold (>90% (0.45 TPY)) were reminded of the threshold.

Ozone

Ozone Monitoring Requirements

The minimum monitoring requirements for ozone are established in Section 4.1 of Appendix D of 40 CFR part 58 and are summarized in Table 15. In addition to these population-based requirements, ozone monitoring is required at NCore sites. Wisconsin currently meets all ozone monitoring requirements (see Table 14). Design values (DVs) used in Table 15 were downloaded from AQS on April 17, 2023. Scales, objectives, seasons and methods of ozone monitors are summarized in Tables 16 and 17. Scales and objectives of monitors have been updated using current information. All ozone monitors continuously collect hourly observations.

Table 14: Ozone Minimum Monitoring Requirements

MSA Population[1,2,5]	Most recent 3-year design value concentrations ≥ 85% of any O_3 NAAQS[3]	Most recent 3-year design value concentration < 85% of any O_3 NAAQS[3,4]
>10 million	4	2
4-10 million	3	1
350,000 - <4 million	2	1
50,000 - <350,000	1	0

1 = Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).
2 = Population based on latest available census figures.
3 = The ozone (O_3) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.
4 = These minimum monitoring requirements apply in the absence of a design value.
5 = Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

Table 15: Wisconsin Ozone Monitoring Requirements

Metropolitan Statistical Area	2021 Population Estimate	Maximum 2020-2022 8-Hour DV as % of Standard (70 ppb)	Minimum Requirement	2022 Sites
Chicago-Naperville-Elgin, IL-IN-WI[1]	9,509,934	107	3	21
Minneapolis-St.Paul-Bloomington, MN-WI[2]	3,690,512	90	2	7
Milwaukee-Waukesha-West Allis, WI[3]	1,566,487	104	2	6
Madison, WI[4]	683,183	94	2	2
Green Bay, WI[5]	329,490	96	1	2
Duluth, MN-WI[6]	290,780	79	0	3
Appleton, WI[7]	244,084	91	1	1
Racine, WI[8]	196,896	107	1	1
Eau Claire, WI[10]	173,317	89	1	1
Oshkosh-Neenah, WI[9]	171,623	-	0	0
Janesville-Beloit, WI[11]	164,381	96	1	1
Wausau, WI[12]	166,189	81	0	1
La Crosse-Onalaska, WI-MN[13]	139,211	84	1	1
Sheboygan, WI[14]	117,747	107	1	2
Fond du Lac, WI[15]	104,362	91	1	1
NCore (Horicon)	Not a population based requirement		1	1

1 = Counties include: Cook (IL), DeKalb (IL), DuPage (IL), Grundy (IL), Jasper (IN), Kane (IL), Kendall (IL), Kenosha (WI), Lake (IL), Lake (IN), McHenry (IL), Newton (IN), Porter (IN) and Will (IL)
2 = Counties include: Anoka (MN), Carver (MN), Chisago (MN), Dakota (MN), Hennepin (MN), Isanti (MN), Le Sueur (MN), Mille Lacs (MN), Ramsey (MN), Scott (MN), Sherburne (MN), Washington (MN), Wright (MN), Pierce (WI), St. Croix (WI)
3 = Counties include: Milwaukee (WI), Ozaukee (WI), Washington (WI) and Waukesha (WI)
4 = Counties include: Columbia (WI), Dane (WI), Green (WI), Iowa (WI)
5 = Counties include: Brown (WI), Kewaunee (WI), Oconto (WI)
6 = Counties include: Carlton (MN), Lake (MN), St. Louis (MN), Douglas (WI)
7 = Counties include: Calumet (WI), Outagamie (WI)
8 = Counties include: Racine (WI)
9 = Counties include: Winnebago (WI)
10 = Counties include: Chippewa (WI), Eau Claire (WI)
11 = Counties include: Rock (WI)
12 = Counties include: Lincoln (WI), Marathon (WI)
13 = Counties include: Houston (MN), La Crosse (WI)
14 = Counties include: Sheboygan (WI)
15 = Counties include: Fond du Lac (WI)

Table 16: Scales and Objectives of Ozone Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
APPLETON – AAL	55-087-0009-44201-1	SLAMS	Ozone	Urban	Max Ozone Concentration
BAD RIVER TRIBAL SCHOOL – ODANAH	55-003-0010-44201-1	Tribal	Ozone	Regional	General/Background
BAYSIDE	55-079-0085-44201-1	SLAMS	Ozone	Neighborhood	Population Exposure
BELOIT – CONVERSE	55-105-0030-44201-1	SLAMS	Ozone	Urban	Regional Transport and Max Ozone Concentration
CHIWAUKEE PRAIRIE STATELINE	55-059-0019-44201-1	SLAMS	Ozone	Neighborhood	Regional Transport and Max Ozone Concentration
COLUMBUS	55-021-0015-44201-1	SLAMS	Ozone	Regional	Max Ozone Concentration
DEVILS LAKE PARK	55-111-0007-44201-1	SLAMS	Ozone	Regional	General / Background
EAU CLAIRE – DOT SIGN SHOP	55-035-0014-44201-1	SLAMS	Ozone	Urban	Max Ozone Concentration
ELKHORN	55-127-0006-44201-1	SLAMS	Ozone	Regional	Regional Transport
FOND DU LAC	55-039-0006-44201-1	SLAMS	Ozone	Regional	Max Ozone Concentration
GRAFTON	55-089-0008-44201-1	SLAMS	Ozone	Neighborhood	Regional Transport and Max Ozone Concentration
GREEN BAY – UW	55-009-0026-44201-1	SLAMS	Ozone	Urban	Population Exposure
HARRINGTON BEACH PARK	55-089-0009-44201-1	SLAMS	Ozone	Urban	Max Ozone Concentration
HORICON WILDLIFE AREA	55-027-0001-44201-2	SLAMS	Ozone	Regional	General/Background
JEFFERSON – LAATSCH	55-055-0009-44201-1	SLAMS	Ozone	Regional	Regional Transport and General/Background
KENOSHA – WATER TOWER	55-059-0025-44201-1	SPM	Ozone	Neighborhood	Population Exposure
KEWAUNEE	55-061-0002-44201-1	SLAMS	Ozone	Neighborhood	Regional Transport and Max Ozone Concentration
LACROSSE – DOT BUILDING	55-063-0012-44201-1	SLAMS	Ozone	Regional	Max Ozone Concentration
LAKE DUBAY	55-073-0012-44201-1	SLAMS	Ozone	Regional	General/Background
MADISON EAST	55-025-0041-44201-1	SLAMS	Ozone	Urban	Population Exposure
MANITOWOC – WDLND DUNES	55-071-0007-44201-1	SLAMS	Ozone	Neighborhood	Regional Transport
MILWAUKEE – SIXTEENTH ST. HEALTH CENTER	55-079-0010-44201-2	SLAMS	Ozone	Neighborhood	Population Exposure
MILWAUKEE – UWM UPark	55-079-0068-44201-1	SLAMS	Ozone	Neighborhood	Population Exposure
NEWPORT PARK	55-029-0004-44201-1	SLAMS	Ozone	Neighborhood	Regional Transport
POTAWATOMI	55-041-0007-44201-1	Tribal	Ozone	Regional	General/Background
RACINE – PAYNE AND DOLAN	55-101-0020-44201-1	SLAMS	Ozone	Neighborhood	Regional Transport and Max Ozone Concentration
SHEBOYGAN – HAVEN	55-117-0009-44201-1	SPM	Ozone	Neighborhood	Population Exposure
SHEBOYGAN – KOHLER ANDRAE	55-117-0006-44201-1	SLAMS	Ozone	Neighborhood	Regional Transport and Max Ozone Concentration
TROUT LAKE	55-125-0001-44201-1	SLAMS	Ozone	Regional	General/Background
WAUKESHA – CLEVELAND AVE	55-133-0027-44201-1	SLAMS	Ozone	Urban	Population Exposure

Table 17: Methods and Season of Ozone Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description	Season
APPLETON – AAL	55-087-0009-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
BAD RIVER TRIBAL SCHOOL – ODANAH	55-003-0010-44201-1	Tribal	087	Ultra Violet Absorption	Year Round
BAYSIDE	55-079-0085-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
BELOIT – CONVERSE	55-105-0030-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
CHIWAUKEE PRAIRIE STATELINE	55-059-0019-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 31
COLUMBUS	55-021-0015-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
DEVILS LAKE PARK	55-111-0007-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
EAU CLAIRE – DOT SIGN SHOP	55-035-0014-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
ELKHORN	55-127-0006-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
FOND DU LAC	55-039-0006-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
GRAFTON	55-089-0008-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
GREEN BAY – UW	55-009-0026-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
HARRINGTON BEACH PARK	55-089-0009-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
HORICON WILDLIFE AREA	55-027-0001-44201-2	SLAMS	087	Ultra Violet Absorption	Year Round
JEFFERSON – LAATSCH	55-055-0009-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
KENOSHA – WATER TOWER	55-059-0025-44201-1	SPM	087	Ultra Violet Absorption	Mar 1 – Oct 31
KEWAUNEE	55-061-0002-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
LACROSSE – DOT BUILDING	55-063-0012-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
LAKE DUBAY	55-073-0012-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
MADISON EAST	55-025-0041-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
MANITOWOC – WDLND DUNES	55-071-0007-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
MILWAUKEE – SIXTEENTH ST. HEALTH CENTER	55-079-0010-44201-2	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
MILWAUKEE – UWM UPark	55-079-0068-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
NEWPORT PARK	55-029-0004-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
POTAWATOMI	55-041-0007-44201-1	Tribal	087	Ultra Violet Absorption	Year Round
RACINE – PAYNE AND DOLAN	55-101-0020-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
SHEBOYGAN – HAVEN	55-117-0009-44201-1	SPM	087	Ultra Violet Absorption	Apr 1 – Oct 15
SHEBOYGAN – KOHLER ANDRAE	55-117-0006-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
TROUT LAKE	55-125-0001-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15
WAUKESHA – CLEVELAND AVE	55-133-0027-44201-1	SLAMS	087	Ultra Violet Absorption	Apr 1 – Oct 15

Carbon Monoxide

Carbon Monoxide Monitoring Requirements

The minimum monitoring requirements for carbon monoxide (CO) are established in Appendix D of 40 CFR Part 58. These requirements include CO monitoring at NCore sites and at one near-road air monitoring site in CBSAs having a population of 1,000,000 or more persons. In addition to these minimum requirements, the Regional Administrator may require additional monitors in situations where data or other information suggests that CO concentrations may be approaching or exceeding the NAAQS. Wisconsin currently meets the minimum CO monitoring requirements and operated one additional CO monitor for purposes of the enhanced ozone plan. (see Table 18). All CO monitors continuously collect hourly observations. Scales, objectives and methods of CO monitors are summarized in Tables 19 and 20.

Table 18: Wisconsin Carbon Monoxide Monitoring Requirements

Core Based Statistical Area > 1 million	2021 Population Estimate	Required		2022 Monitors		
		Near-Road	NCore	Near-Road	NCore	Other
Chicago-Naperville-Elgin, IL-IN-WI[1]	9,509,934	1	1	1	1	1
Minneapolis-St.Paul-Bloomington, MN-WI[2]	3,690,512	1	1	2	1	3
Milwaukee-Waukesha-West Allis, WI[3]	1,566,487	1	0	1	0	0
DNR Rural NCore (Horicon)	Not a population based requirement	0	1	0	1	0

1 = Counties include: Cook (IL), DeKalb (IL), DuPage (IL), Grundy (IL), Jasper (IN), Kane (IL), Kendall (IL), Kenosha (WI), Lake (IL), Lake (IN), McHenry (IL), Newton (IN), Porter (IN) and Will (IL)
2 = Counties include: Anoka (MN), Carver (MN), Chisago (MN), Dakota (MN), Hennepin (MN), Isanti (MN), Le Sueur (MN), Mille Lacs (MN), Ramsey (MN), Scott (MN), Sherburne (MN), Washington (MN), Wright (MN), Pierce (WI), St. Croix (WI)
3 = Counties include: Milwaukee (WI), Ozaukee (WI), Washington (WI) and Waukesha (WI)

Table 19: Scales and Objectives of Carbon Monoxide Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
CHIWAUKEE PRAIRIE STATELINE	55-059-0019 42101-1	SPM	Carbon Monoxide	Neighborhood	Regional Transport
HORICON WILDLIFE AREA	55-027-0001-42101-1	SLAMS	Carbon Monoxide	Regional	General/Background
MILWAUKEE – COLLEGE AVE. NR	55-079-0056-42101-1	SLAMS	Carbon Monoxide	Neighborhood	Max Precursor Emissions Impact

Table 20: Methods of Carbon Monoxide Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description
CHIWAUKEE PRAIRIE STATELINE*	55-059-0019-42101-1	SPM	593	Gas Filter Correlation
HORICON WILDLIFE AREA	55-027-0001-42101-1	SLAMS	593	Gas Filter Correlation
MILWAUKEE – COLLEGE AVE. NR	55-079-0056-42101-1	SLAMS	593	Gas Filter Correlation

*Operates June-August to support enhanced ozone monitoring

Nitrogen Dioxide

Nitrogen Dioxide Monitoring Requirements

The minimum monitoring requirements for nitrogen dioxide (NO_2) are established in Appendix D of 40 CFR Part 58. There are two primary monitoring objectives for NO_2 including monitoring near roads and population based (area-wide). Table 21 summarizes the minimum monitoring requirements for NO_2. In addition to these minimum requirements, the Regional Administrator may require additional monitoring in areas where NO_2 is expected to be near the level of the NAAQS. Currently, Wisconsin meets all NO_2 monitoring requirements and operates two additional seasonal NO_2 monitors for the purpose of its enhanced ozone monitoring plan (Table 22). Scales, objectives and methods of NO_2 monitors are summarized in Tables 23 and 24. Scales and objectives of monitors have been updated using current information.

Table 21: Nitrogen Dioxide Minimum Monitoring Requirements

CBSA Population	Near-Road Monitors	Area-Wide Monitors
> 1,000,000	1	1
> 2,500,000	2	1

Table 22: Wisconsin Nitrogen Dioxide Monitoring Requirements

Core Based Statistical Area > 1 million	2021 Population Estimate	Required		2022 Monitors		
		Near-Road	Area-Wide	Near-Road	Area Wide	Other
Chicago-Naperville-Elgin, IL-IN-WI[1]	9,509,934	2	1	3	4	0
Minneapolis-St.Paul-Bloomington, MN-WI[2]	3,690,512	2	1	2	1	2
Milwaukee-Waukesha-West Allis, WI[3]	1,566,487	1	0	1	0	1
DNR Rural NCore (Horicon)	Not a population based requirement	0	1	0	1	0

1 = Counties include: Cook (IL), DeKalb (IL), DuPage (IL), Grundy (IL), Jasper (IN), Kane (IL), Kendall (IL), Kenosha (WI), Lake (IL), Lake (IN), McHenry (IL), Newton (IN), Porter (IN) and Will (IL)
2 = Counties include: Anoka (MN), Carver (MN), Chisago (MN), Dakota (MN), Hennepin (MN), Isanti (MN), Le Sueur (MN), Mille Lacs (MN), Ramsey (MN), Scott (MN), Sherburne (MN), Washington (MN), Wright (MN), Pierce (WI), St. Croix (WI)
3 = Counties include: Milwaukee (WI), Ozaukee (WI), Washington (WI) and Waukesha (WI)

Table 23: Scales and Objectives of Nitrogen Dioxide Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
CHIWAUKEE PRAIRIE STATELINE*	55-059-0019-42602-1	SPM	Nitrogen Dioxide (NO_2)	Regional	Regional Transport
HORICON WILDLIFE AREA	55-027-0001-42612-4	SLAMS	Reactive Oxides of Nitrogen (NO_Y)	Regional	General/Background
MILWAUKEE – COLLEGE AVE. NR	55-079-0056-42602-1	SLAMS	Nitrogen Dioxide (NO_2)	Microscale	Highest Concentration
MILWAUKEE – UWM UPARK	55-079-0068-42602-1	SLAMS	Nitrogen Dioxide (NO_2)	Neighborhood	Population Exposure

*Operates June-August to support enhanced ozone monitoring

Table 24: Methods of DNR Nitrogen Dioxide Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description
CHIWAUKEE PRAIRIE STATELINE	55-059-0019-42602-1	SPM	256	Cavity Attenuation Phase Shift
HORICON WILDLIFE AREA	55-027-0001-42612-4	SLAMS	699	Chemiluminescence
MILWAUKEE – COLLEGE AVE. NR	55-079-0056-42602-1	SLAMS	212	Cavity Attenuation Phase Shift
MILWAUKEE – UWM UPARK	55-079-0068-42602-1	SLAMS	256	Cavity Attenuation Phase Shift

Sulfur Dioxide

Sulfur Dioxide Monitoring Requirements

The minimum monitoring requirements for SO_2 are established in Appendix D of 40 CFR Part 58. The SO_2 monitoring requirement is based on the Population Weighted Emissions Index (PWEI) for all Core Based Statistical Areas (CBSAs). The PWEI is calculated by multiplying the population of each CBSA, using the most recent census data or estimates, and the total amount of SO_2 in tons per year emitted within the CBSA area, using an aggregate of the most recent county level emissions data available in the National Emissions Inventory (NEI) for each county in each CBSA. The resulting value is divided by one million providing a PWEI value. The units are million person-tons per year. The minimum monitoring requirements based on PWEI are summarized in Tables 25 and 26. For NCore sites, SO_2 monitoring is required independent of population-based requirements.

Table 25: Sulfur Dioxide Minimum Monitoring Requirements

PWEI	Required Sites
≥1 million	3
100,000 to < 1 million	2
5,000 to < 100,000	1

Table 26: Wisconsin Sulfur Dioxide Monitoring Requirements

Core Based Statistical Area	2021 Population Estimate	2017 NEI SO_2 (tons/year)	PWEI	Minimum Requirement	2022 Sites
Chicago-Naperville-Elgin, IL-IN-WI[1]	9,509,934	42,535	402,317	2	7
Minneapolis-St.Paul-Bloomington, MN-WI[2]	3,690,512	10,685	38,893	1	6
Milwaukee-Waukesha-West Allis, WI[3]	1,566,487	1,006	1,584	0	1
Madison, WI[4]	683,183	2,325	1,546	0	1
Green Bay, WI[5]	329,490	1,896	612	0	1
Duluth, MN-WI[6]	290,780	6,225	1,797	0	1
Appleton, WI[7] Source Based Monitor	244,084	6,118	1,456	0	1
Racine, WI[8]	196,896	179	35	0	0
Eau Claire, WI[10]	173,317	53	9	0	0
Oshkosh-Neenah, WI[9]	171,623	89	15	0	0
Janesville-Beloit, WI[11]	164,381	1	0	0	0
Wausau, WI[12]	166,189	2,201	359	0	0
La Crosse-Onalaska, WI-MN[13]	139,211	82	11	0	0
Sheboygan, WI[14]	117,747	4,517	521	0	0
Fond du Lac, WI[15]	104,362	86	9	0	0
Horicon, WI DNR Rural NCore	Not a population based requirement			1	1
Rhinelander, WI Source Based Monitor	Not a population based requirement			0	1

1 = Counties include: Cook (IL), DeKalb (IL), DuPage (IL), Grundy (IL), Jasper (IN), Kane (IL), Kendall (IL), Kenosha (WI), Lake (IL), Lake (IN), McHenry (IL), Newton (IN), Porter (IN) and Will (IL)

2 = Counties include: Anoka (MN), Carver (MN), Chisago (MN), Dakota (MN), Hennepin (MN), Isanti (MN), Le Sueur (MN),

Mille Lacs (MN), Ramsey (MN), Scott (MN), Sherburne (MN), Washington (MN), Wright (MN), Pierce (WI), St. Croix (WI)
3 = Counties include: Milwaukee (WI), Ozaukee (WI), Washington (WI) and Waukesha (WI)
4 = Counties include: Columbia (WI), Dane (WI), Green (WI), Iowa (WI)
5 = Counties include: Brown (WI), Kewaunee (WI), Oconto (WI)
6 = Counties include: Carlton (MN), Lake (MN), St. Louis (MN), Douglas (WI)
7 = Counties include: Calumet (WI), Outagamie (WI)
8 = Counties include: Racine (WI)
9 = Counties include: Winnebago (WI)
10 = Counties include: Chippewa (WI), Eau Claire (WI)
11 = Counties include: Rock (WI)
12 = Counties include: Lincoln (WI), Marathon (WI)
13 = Counties include: Houston (MN), La Crosse (WI)
14 = Counties include: Sheboygan (WI)
15 = Counties include: Fond du Lac (WI)

In addition to the minimum monitoring requirements above, on August 21, 2015, EPA published its final Data Requirements Rule (DRR) for the 2010 1-hour SO_2 NAAQS (80 Fed. Reg. 51052). On July 1, 2016, DNR notified EPA that the department would be characterizing the air quality around one DRR-listed source (The Ahlstrom-Munksjo facility (formerly Expera) in Kaukauna) using ambient monitoring. This monitor was installed and was operational by January 1, 2017. The Kaukauna site operations were administered by the facility but transferred to DNR in February 2020 per state statute.

There are two source-oriented sites (Kaukauna and Rhinelander Tower), two non-source oriented sites (Milwaukee-UWM UPark and Potawatomi) and one NCore site (Horicon Wildlife Area). Scales, objectives and methods of SO_2 monitors are summarized in Tables 27 and 28. Scales and objectives of monitors have been updated using current information.

Table 27: Scales and Objectives of DNR and Industrial Sulfur Dioxide Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
KAUKAUNA	55-087-0015-42401-1	Industrial	Sulfur Dioxide (SO_2)	Neighborhood	Highest Concentration and Source Oriented
HORICON WILDLIFE AREA	55-027-0001-42401-1	SLAMS	Sulfur Dioxide (SO_2)	National/Global	General/Background
MILWAUKEE – UWM UPARK	55-079-0068-42401-1	SLAMS	Sulfur Dioxide (SO_2)	Urban	Population Exposure
POTAWATOMI	55-041-0007-42401-1	Tribal	Sulfur Dioxide (SO_2)	Regional	General/Background
RHINELANDER TOWER	55-085-0996-42401-1	SLAMS	Sulfur Dioxide (SO_2)	Neighborhood	Highest Concentration and Source Oriented

Table 28: Methods of DNR and Industrial Sulfur Dioxide Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description
KAUKAUNA	55-087-0015-42401-1	Industrial	100	Ultraviolet Fluorescence
HORICON WILDLIFE AREA	55-027-0001-42401-1	SLAMS	600	Ultraviolet Fluorescence
MILWAUKEE – UWM UPARK	55-079-0068-42401-1	SLAMS	100	Ultraviolet Fluorescence
POTAWATOMI	55-041-0007-42401-1	Tribal	100	Ultraviolet Fluorescence
RHINELANDER TOWER	55-085-0996-42401-1	SLAMS	100	Ultraviolet Fluorescence

Appendix B:
Waivers and Approvals

Summary

EPA establishes minimum requirements for air monitoring networks. However, EPA can waive many of these requirements. For example, EPA establishes the minimum sampling frequencies for $PM_{2.5}$ monitors. Deviations from these minimums may be granted by submitting requests to the EPA Regional Administrator based on factors including the historical $PM_{2.5}$ data quality assessments, the location of current $PM_{2.5}$ design value sites and regulatory data needs. Approved deviations from the minimum sampling frequencies are formalized in waivers. This appendix contains air monitoring waivers and any associated approvals.

Federal Regulation

Specific types of waivers appear in a number of sections in 40 CFR § 58.

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Waivers and Approvals

$PM_{2.5}$ / PM_{10} Network

- Numerous changes have occurred to the DNR $PM_{2.5}$ and PM_{10} networks as they have transitioned to a primary continuous FEM network. These changes have been communicated with EPA throughout the process. The annual network plan approvals are considered sufficient to document these changes in the network which included:
    - Shut down of FRM units in favor of continuous FEMs.
    - Added/terminated/relocated collocated monitors to ensure 15% collocation per primary $PM_{2.5}$ method and 15% of manual PM_{10} sites are being met and are located at sites that measure among the highest in the state.

Kenosha - Water Tower (55-059-0025)

- EPA approved that after 24 months of operation the ozone monitor will retain a monitor type of SPM and the monitor measurements will be considered comparable to the ozone NAAQS. See Figure 1.

Sheboygan - Haven (55-117-0009)

- EPA approved that after 24 months of operation the ozone monitor will retain a monitor type of SPM and the monitor measurements will be considered comparable to the ozone NAAQS. See Figure 2.

Sheboygan County, Lead Monitoring Waiver (55-117-0009)

- EPA approved the request to discontinue lead monitoring near the Kohler facility in Sheboygan County and granted a waiver to allow the site to be shutdown. Since beginning operation in 2010, the Kohler lead site never recorded an exceedance of the standard and recorded reductions in monitored lead concentrations, emissions, design values and variability. Data collection ended December 31, 2018.

Ozone Season Waiver

- EPA approved DNR's request to alter ozone monitoring season for the majority of DNR monitoring sites based on historical monitoring data. See figure 3. All ozone monitors will operate from April 1 – October 15 with the exception of:
    - Year round sites
    - Kenosha county sites which are a part of the Chicago-Naperville-Elgin, IL-IN-WI MSA which will operate from March 1 – October 31

Lake Geneva/Elkhorn Ozone Data Combination Approval

- EPA approved DNR's request to combine ozone data from the Lake Geneva and Elkhorn sites in Walworth County. See Figure 5

Edgewater Station Annual Emissions Assessment Waiver

- EPA approved DNR's modeling analysis based on allowable emissions for the Wisconsin Power and Light Edgewater Generating Station in Sheboygan, WI (Edgewater Station). This approval waives the requirement to do an annual emissions assessment for this facility as part of Appendix G. See Figure 6.

Figure 1: Kenosha - Water Tower Ozone Monitor Approval

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

MAR 31 2015

REPLY TO THE ATTENTION OF:

Bart Sponseller
Deputy Division Administrator
Air, Waste, Remediation, and Redevelopment Division
Wisconsin Department of Natural Resources
101 South Webster Street
Madison, Wisconsin 53703

Subject: Kenosha Water Tower Special Purpose Monitor (Site ID: 55-059-0025)

Dear Mr. Sponseller:

As background, Wisconsin Department of Natural Resources (WDNR), began operating the seasonal ozone special purpose monitoring (SPM) site at Kenosha – Water Tower (Site ID: 55-059-0025) in May, 2013, in response to significant public and industry concern regarding the partial Kenosha County nonattainment area for the 2008 ozone National Ambient Air Quality Standard (NAAQS). The monitor also helps WDNR and the Lake Michigan Air Directors Consortium understand ozone formation and transport in southeastern Wisconsin and along the Lake Michigan lakeshore. For these reasons, WDNR would like to continue operating the Kenosha – Water Tower monitor for one or more additional ozone seasons as a SPM.

The Environmental Protection Agency confirms that WDNR may continue to operate the special purpose Kenosha – Water Tower ozone monitoring site (site ID: 55-059-0025) beyond 24 months. As a special purpose monitor (SPM), it will not be required to meet shutdown criteria in 40 CFR Part 58.14(c)(2). WDNR should include this monitor in the annual air monitoring network plan as an SPM, noting that WDNR may re-evaluate the need to continue this monitoring site after the conclusion of the 2015 ozone season. Although this site will continue to be considered a SPM, data collected from this monitor after 24 months of operation may be utilized for comparison to the applicable NAAQS, as described in 40 CFR Part 58.20.

If you have any additional questions about this matter, please contact Michael Compher, of my staff, at (312) 886-5745.

Sincerely,

Mary Pat Tyson
Branch Chief
Region 5 Air Toxics and Assessment Branch

Figure 2: Sheboygan - Haven Ozone Monitor Approval

From: Compher, Michael <compher.michael@epa.gov> Sent: Fri 04/28/2017 9:54 AM
To: Praedel, Katie - DNR; Nwia, Jacqueline
Cc: Hetherington, Grant D - DNR
Subject: RE: Kenosha (Water Tower) and Sheboygan (Haven) Ozone Monitors

Message | Kenosha%20Monitor.pdf (280 KB)

All - For reference, I've attached EPA's correspondence on this from 2015 clarifying the monitor type and intended use of the data. Consistent with Katie's response below, both are considered SPM and the data (after 24 months of operation) may be used for NAAQS purposes. The AQS design value report is probably filtering to exclude SPMs, or monitors with NAAQS exclusion indicators. AQS shouldn't exclude the monitors from the DV report unless there is both a NAAQS exclusion indicator applied by WDNR for the site, as well as a Regional concurrence on the NAAQS exclusion indicator in AQS.

Michael Compher
Chief, Air Monitoring and Analysis Section Region 5 Air and Radiation Division U.S. Environmental Protection Agency
Phone: 312-886-5745

Figure 3: Sheboygan County Lead Monitoring Waiver

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

MAR 2 2 2019

REPLY TO THE ATTENTION OF

Ms. Gail Good
Director, Bureau of Air Management
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, Wisconsin 53707-7921

Dear Ms. Good:

The U.S. Environmental Protection Agency received the Wisconsin Department of Natural Resources' (WDNR's) request of February 28, 2019 to discontinue ambient air monitoring for lead (Pb) at the Kohler site (55-17-0008) in Sheboygan County and to waive the Pb monitoring requirements of 40 CFR Appendix D, section 4.5(a)(ii) near the Kohler facility.

The request to discontinue a State/Local Air Monitoring Station monitor was reviewed by EPA against the system modification criteria in 40 CFR part 58.14(c). Based on air quality data collected at this monitoring station and reported to the EPA's Air Quality System, the Kohler Pb site satisfies the shut-down criteria because it has been in attainment of the Pb National Ambient Air Quality Standard (NAAQS) from 2014 through 2018, and it has less than a 10% probability of exceeding 80% of the Pb NAAQS during the next three years (2019-2021).

For WDNR to continue to meet the network requirements, this letter also waives the Pb monitoring requirements near the Kohler facility, consistent with 40 CFR Appendix D, section 4.5(a)(ii), because WDNR demonstrates that Kohler will not contribute to a maximum Pb concentrations in ambient air greater than 50 percent of the NAAQS (based on historical monitoring data, modeling, or other means). This Pb monitoring waiver must be renewed once every 5 years as part of the WDNR annual network plan required under 40 CFR Part 58.10.

If you have any questions or comments regarding this letter, please contact Michael Compher, Air Monitoring and Analysis Section Chief, at (312) 886-5745.

Sincerely,

Edward Nam
Director
Air and Radiation Division

Figure 4: Ozone Season Waiver

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

DEC 21 2018

REPLY TO THE ATTENTION OF:

Ms. Gail Good
Director, Bureau of Air Management
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, Wisconsin 53707-7921

Dear Ms. Good:

The U.S. Environmental Protection Agency has reviewed the Wisconsin Department of Natural Resources' (WDNR) request of November 19, 2018 to waive ambient ozone monitoring between March 1 and March 31 for 26 ozone monitors.

EPA approves the request for 24 of the 26 ozone monitors identified in Table 1 of the WNDR's November 19, 2018 letter. EPA is disapproving the WDNR's request to waive ozone monitoring requirements in March for the Chiwaukee Prairie (55-059-0019) and Kenosha Water Tower (55-059-0025) monitoring sites in Kenosha County. These two ozone monitoring sites should continue to monitor from March 1 through October 31 (extension to October 31 was approved on December 5, 2017) to maintain consistency with both the Illinois and Indiana ozone monitoring season, since it is part of the Chicago-Naperville-Elgin, IL-IN-WI metropolitan statistical area, and Memorandum of Agreement (signed in 2017 and contained in Appendix C of Wisconsin's Annual Network Monitoring Plan) between the three states regarding monitoring in multi-state areas.

EPA is approving the shortening of the ozone season, eliminating March for most sites, because the data demonstrates that elevated ozone levels in Wisconsin during the month of March are rare. The analysis included a review of ozone data from 2012 through 2018 and consideration of the criteria in 40 C.F.R. Part 58, Appendix D, Section 4.1(i), including frequency of ozone exceedances in March, occurrences of the moderate air quality index level in March, regional consistency, and logistical issues, such as site access. In reviewing your request, EPA also considered the document "Guidelines for Selecting and Modifying the Ozone Monitoring Season Based on an 8-Hour Ozone Standard."[1]

To reiterate EPA's prior decision conveyed in our December 5, 2017 letter to WDNR, the ozone monitoring season for the Chiwaukee Prairie and Kenosha Water Tower monitors in Kenosha County extends to October 31, which is two weeks past the end of the ozone season for most of

[1] Guidelines for Selecting and Modifying the Ozone Monitoring Season, EPA's Office of Air Quality Planning and Standards (June 1998)

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the other ozone monitors in Wisconsin. This two-week extension provides consistency with the States of Illinois and Indiana ozone seasons where other monitors are operated within the Chicago-Naperville, IL-IN-WI ozone nonattainment area, as well as the Memorandum of Agreement signed by all three states contained in Appendix C of WDNR's 2019 annual network plan.

If you have any questions or comments regarding this approval, please contact Michael Compher, Air Monitoring and Analysis Section Chief, at (312) 886-5745.

Sincerely,

Edward Nam
Director
Air and Radiation Division

Figure 5: Lake Geneva/Elkhorn Ozone Data Combination Approval

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

MAR 0 2 2020

REPLY TO THE ATTENTION OF

Ms. Gail Good
Director, Bureau of Air Management
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, Wisconsin 53707-7921

Dear ~~Ms. Good~~ Gail:

The U.S. Environmental Protection Agency received the Wisconsin Department of Natural Resources' (WDNR) request of February 19, 2020 to combine the monitoring data for the Walworth County ozone monitoring site for design value calculations, following a site relocation from Lake Geneva (55-127-0005) to Elkhorn (55-127-0006). The relocation of the monitoring site was proposed in WDNR's 2019 Annual Air Monitoring Network Plan and approved by EPA on September 20, 2018. EPA approves WDNR's request to combine data from the two sites to allow for a contiguous data set and calculation of design values for Walworth County.

The request to combine monitoring data was reviewed by EPA against criteria in 40 CFR Part 50, Appendix U.2(c). Based on similarities between the two sites including proximity, monitoring scale, and monitoring objective, and similar local meteorology and emissions, the Elkhorn monitoring site satisfies the criteria for combining the monitoring data.

If you have any questions or comments regarding this letter, please contact Michael Compher, Air Monitoring and Analysis Section Chief, at (312) 886-5745.

Sincerely,

John Mooney
Acting Director
Air and Radiation Division

Figure 6: Edgewater Station Annual Emissions Assessment Waiver

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

MAR 04 2020

Ms. Gail Good
Director, Air Management
Wisconsin Department of Natural Resources
101 S. Webster Street, Box 7921
Madison, Wisconsin 53707-7921

Dear ~~Ms. Good~~ Gail:

I am writing in response to the sulfur dioxide (SO_2) dispersion modeling analysis included in your "SO_2 Data Requirements Rule Emissions Assessment", submitted as Appendix G in your "Wisconsin Department of Natural Resources 2020 Air Monitoring Network Plan". We have reviewed your assessment and agree that no further action is needed for the Edgewater Station under the Data Requirements Rule.

The Data Requirements Rule provides that "[f]or any area where modeling of actual SO_2 emissions serve as the basis for designating such area as attainment for the 2010 SO_2 [National Ambient Air Quality Standard (NAAQS)], the air agency shall submit an annual report to the [U.S. Environmental Protection Agency] Regional Administrator" providing specified types of information, including a recommendation as to the need for further modeling to assess whether the area is continuing to attain the NAAQS. *See* 40 CFR 51.1205(b). However, "[a]ny air agency that demonstrates that an area would meet the 2010 SO_2 NAAQS with allowable emissions is not required pursuant to paragraph (b) of this section to submit future annual reports for the area." *See* 40 CFR 51.1205(c).

EPA has reviewed your modeling analysis for the Wisconsin Power and Light Edgewater Generating Station in Sheboygan, Wisconsin (Edgewater Station), using allowable emissions and finds that it meets the modeling requirements of Appendix W to 40 CFR 51 and demonstrates attainment in accordance with the regulatory provisions of 40 CFR 51.1205(c). As previously mentioned, we agree that no further annual emissions assessments are required under the Data Requirements Rule for the Edgewater Station.

Thank you for your work on this area. If you have any questions, please contact me at (312) 886-6043 or Sarah Arra of my staff at (312) 886-9401.

Sincerely,

John Mooney
Acting Director
Air and Radiation Division

Appendix C:
Memorandums of Agreement

Summary

Due to the geographic monitoring boundaries determined by EPA, Wisconsin is working collaboratively with adjacent states to meet 40 CFR 58 Appendix D, Section 2(e) minimum monitoring requirements. Memorandum of Agreements (MOAs) are designed to reaffirm that we are meeting monitoring requirements established by EPA. The two following MOAs constitute this reaffirmation.

DNR reconfirmed with Minnesota Pollution Control Agency's monitors are meeting minimum monitoring requirements. Due to the age of the MOA, an updated Minnesota-Wisconsin MOA will be developed to reflect current monitoring configurations.

Federal Regulation

40 CFR § 58 Appendix D to Part 58 2(e) This appendix uses the statistical-based definitions for metropolitan areas provided by the Office of Management and Budget and the Census Bureau. These areas are referred to as metropolitan statistical areas (MSA), micropolitan statistical areas, core-based statistical areas (CBSA), and combined statistical areas (CSA). A CBSA associated with at least one urbanized area of 50,000 population or greater is termed a Metropolitan Statistical Area (MSA). A CBSA associated with at least one urbanized cluster of at least 10,000 population or greater is termed a Micropolitan Statistical Area. CSA consist of two or more adjacent CBSA. In this appendix, the term MSA is used to refer to a Metropolitan Statistical Area. By definition, both MSA and CSA have a high degree of integration; however, many such areas cross State or other political boundaries. MSA and CSA may also cross more than one air shed. The EPA recognizes that State or local agencies must consider MSA/CSA boundaries and their own political boundaries and geographical characteristics in designing their air monitoring networks. The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator.

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Memorandum of Agreement with Minnesota

Memorandum of Agreement
Air Quality Monitoring for Criteria Pollutants for the
Minneapolis – St. Paul, MN-WI
Metropolitan Statistical Area (MSA)

Participating Agencies:

Minnesota Pollution Control Agency (MPCA)
Environmental Analysis and Outcomes Division

Wisconsin Department of Natural Resources (WDNR)
Bureau of Air Management

Purpose, Objectives and Goals

The purpose of this Memorandum of Agreement (MOA) is to establish the Minneapolis-St. Paul, MN-WI MSA Criteria Pollutants Air Quality Monitoring Agreement between the MPCA and WDNR to collectively meet United States Environmental Protection Agency (US EPA) minimum monitoring requirements for:

- Particles of an aerodynamic diameter of 10 micrometers and less (PM10),
- Particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5),
- Ozone (O_3),
- Sulfur Dioxide (SO_2),
- Nitrogen Dioxide (NO_2),
- Carbon Monoxide (CO),
- Lead (Pb), and
- Other criteria pollutants as deemed necessary to meet the needs of the MSA as determined reasonable by all parties.

The Minneapolis-St. Paul, MN-WI MSA had an estimated population of 3,208,212 in July, 2007. The MSA consists of 11 counties in Minnesota (Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington, and Wright) and 2 counties in Wisconsin (Pierce, St. Croix).

According to 40 CFR Part 58, Appendix D, the Minneapolis-St. Paul, MN-WI MSA minimum monitoring requirements (based on an estimated population of 3,208,212) are:

Monitors Required	Parameter
2-4	PM_{10}
3	$PM_{2.5}$
2	Ozone
2	Sulfur Dioxide by January 1, 2013
1	Carbon Monoxide

Monitors Required	Parameter
2	Near-road NO_2 by January 1, 2013
1	Area-wide NO_2 by January 1, 2013
1	Lead at NCore by December 27, 2011

This MOA will formalize the collective agreement between the MPCA and WDNR to provide adequate criteria pollutant monitoring for the Minneapolis-St. Paul, MN-WI MSA as required by 40 CFR 58 Appendix D, Section 2(e).

To meet the minimum monitoring requirements for the Minneapolis-St. Paul, MN-WI MSA, the following sites will collect the required parameters during the 2011 monitoring year:

County	AQS ID	Site Name	$PM_{2.5}$ FRM	$PM_{2.5}$ Continuous (FEM)	$PM_{2.5}$ Continuous (non-FEM)	$PM_{2.5}$ Speciation	$PM_{2.5}$ Collocated	PM_{10}	TSP / Lead	Ozone	Oxides of Nitrogen	Sulfur Dioxide	Carbon Monoxide
Anoka	27-003-1001	Cedar Creek								X			
Anoka	27-003-1002	Blaine -NCore	X	X		X		X^C	2012	X	X^T	X^T	X^T
Dakota	27-037-0020	FHR 420							X		X	X	X
Dakota	27-037-0423	FHR 423									X	X	X
Dakota	27-163-0442	FHR 442										X	
Dakota	27-037-0443	FHR 443										X	
Dakota	27-037-0470	Apple Valley	X		X				X				
Hennepin	27-053-0954	Arts Center										X	X
Hennepin	27-053-0963	H.C. Andersen School	X	X		X			X				
Hennepin	27-053-0966	City of Lakes						X	X				
Hennepin	27-053-1007	Humboldt Avenue						X	X				
Hennepin	27-053-2006	St. Louis Park	X										
Ramsey	27-123-0050	Lexington Avenue											X
Ramsey	27-123-0866	Red Rock Road						X					
Ramsey	27-123-0868	Ramsey Health Center	X					X^C					
Ramsey	27-123-0871	Harding High School	X	X			X		X				
Scott	27-139-0505	Shakopee	X							X			

^{C} = continuous, ^{T} = trace

County	AQS ID	Site Name	$PM_{2.5}$ FRM	$PM_{2.5}$ Continuous (FEM)	$PM_{2.5}$ Continuous (non-FEM)	$PM_{2.5}$ Speciation	$PM_{2.5}$ Collocated	PM_{10}	TSP / Lead	Ozone	Oxides of Nitrogen	Sulfur Dioxide	Carbon Monoxide
Washington	27-163-0436	MPC 436										X	
Washington	27-163-0438	MPC 438							X				
Washington	27-163-0446	Point Road							X				
Washington	27-163-6015	Stillwater Twp								X			
Wright	27-171-3201	St. Michael			X					X			
Total			7	3	2	2	1	5	9	5	3	7	5

Responsibilities/Actions

Each of the parties to this Agreement is responsible for ensuring that its obligations under the MOA are met. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other communications to discuss monitoring activities for the MSA. Each affected agency shall inform the other affected agencies via telephone or email of any monitoring changes occurring within its jurisdiction of the MSA at its earliest convenience, after learning of the need for the change or making the changes. Such unforeseen changes may include evictions from monitoring sites, destruction of monitoring sites due to natural disasters, or any occurrences that result in an extended (greater than a quarter) or permanent change in the monitoring network.

Limitations

- All commitments made in this MOA are subject to the availability of appropriated funds and each agency's budget priorities. Nothing in this MOA obligates MPCA or WDNR to expend appropriations or to enter into any contract, assistance agreement, interagency agreement or other financial obligation.
- This MOA is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between parties to this agreement will be handled in accordance with applicable laws, regulations and procedures and will be subject to separate agreements that will be affected in writing by representatives of the parties.
- This MOA does not create any right or benefit enforceable by law or equity against MPCA or WDNR, their officers or employees or any other person. This MOA does not apply to any entity outside MPCA or WDNR.

- No proprietary information or intellectual property is anticipated to arise out of this MOA.

Termination

This Memorandum of Agreement may be revised upon the mutual consent of MPCA and WDNR. Each party reserves the right to terminate this MOA. A thirty (30) day written notice must be given prior to the date of termination.

Approvals

We agree with the provisions outlined in this Memorandum of Agreement and commit our agencies to implement them in a spirit of cooperation and mutual support.

Minnesota Pollution Control Agency
Environmental Analysis and Outcomes Division

By: _____
Title: Director
Date: 1/25/11

Wisconsin Department of Natural Resources
Bureau of Air Management

By: _____
Title: Director
Date: 1/31/11

Memorandum of Agreement with Illinois and Indiana

MEMORANDUM OF AGREEMENT
BETWEEN
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
WISCONSIN DEPARTMENT OF NATURAL RESOURCES
AND
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT,
OFFICE OF AIR QUALITY

This Memorandum of Agreement (MOA) is made and entered into by the Illinois Environmental Protection Agency (Illinois EPA), Wisconsin Department of Natural Resources (WDNR), and Indiana Department of Environmental Management (IDEM) Office of Air Quality (OAQ), who shall be collectively referred to as the PARTIES.

I. PURPOSE

The purpose of this MOA is to document the means by which the PARTIES collectively meet United States Environmental Protection Agency (USEPA) minimum air quality monitoring requirements in the Chicago-Naperville-Elgin, IL-IN-WI Metropolitan Statistical Area (MSA) for criteria pollutants. These include particles of an aerodynamic diameter of 10 micrometers and less (PM10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), ozone, and other criteria pollutants for which monitoring is deemed necessary. According to 40 CFR Part 58, Appendix D, the Chicago-Naperville-Elgin, IL-IN-WI MSA minimum monitoring requirements (based on a population of 9,537,289 from a 2013 estimate using Census 2010) are three (3) ozone monitors, two to four (2-4) PM10 monitors, three (3) Federal Equivalent Method (FEM) continuous or Federal Reference Method (FRM) PM2.5 monitors, two (2) collocated continuous PM2.5 monitors with the FRM PM2.5 monitors, three (3) sulfur dioxide monitors, two (2) near-road nitrogen dioxide monitors, one (1) area-wide nitrogen dioxide monitor, one (1) carbon monoxide monitor, and one (1) lead monitor.

II. UNDERSTANDING

It is mutually agreed upon and understood among the PARTIES to this MOA that, as a whole, the PARTIES meet USEPA minimum monitoring requirements. This MOA shall be effective upon execution of a Signature Page by all PARTIES. This MOA may be executed in one or more counterparts, each of which shall be deemed an original to all PARTIES of this MOA. The current number of monitors in each county for the MSA monitoring network is provided in the tables below. A map of the monitor locations is also provided below. It is understood by all PARTIES that each PARTY may, on its own accord, make changes within its jurisdiction of the MSA, consistent with applicable regulations and as approved by USEPA, without any additional requirements being imposed by this MOA.

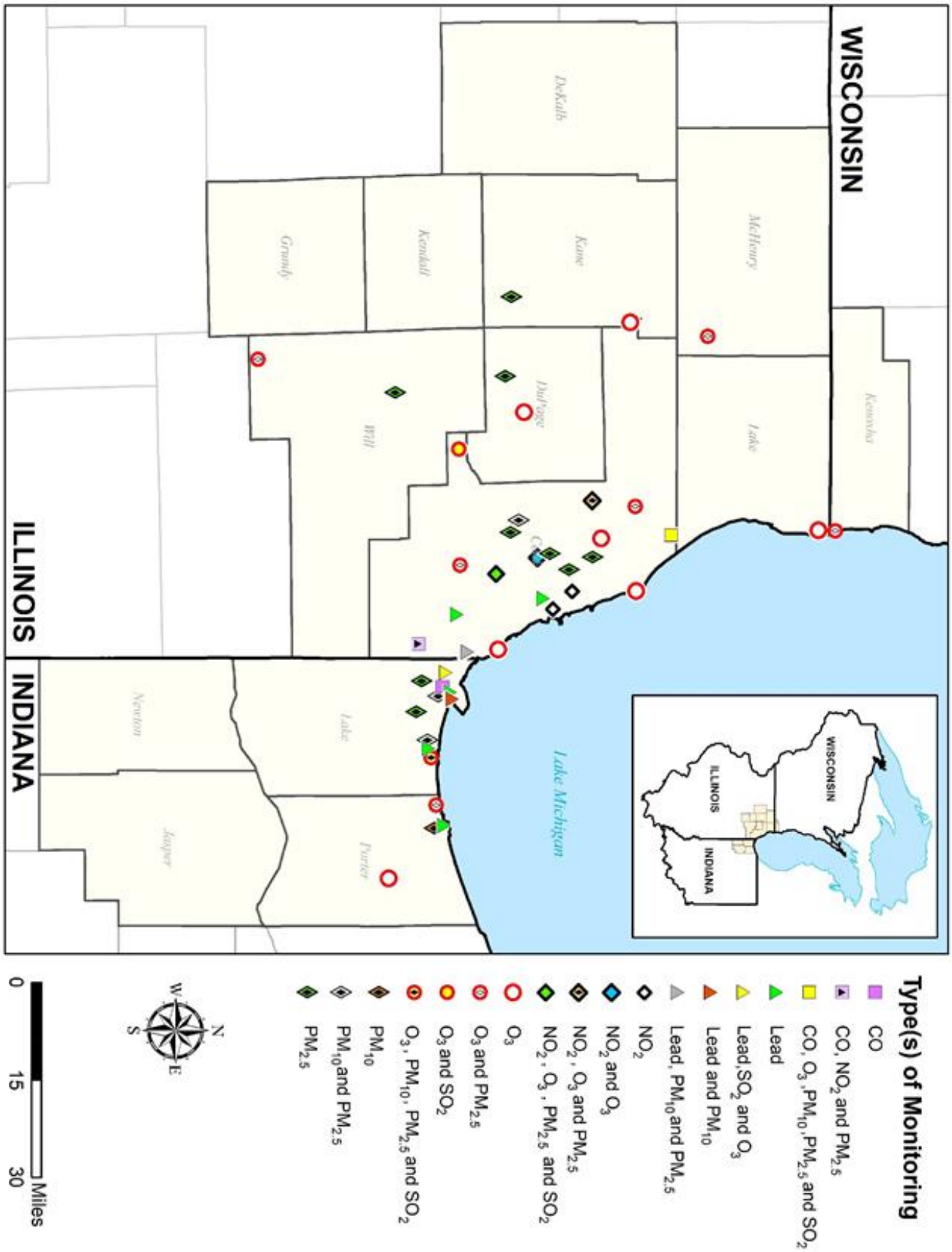
Criteria Air Pollutant MSA Monitoring Network Excluding PM2.5

State / FIPS State ID	County / FIPS County ID	PM10	O_3	NO2 Near-Road	NO2 Community Wide	CO	SO_2	LEAD
Illinois / 17	Cook / 031	3	10	2	4	2	3	3
Illinois / 17	DeKalb / 037	0	0	0	0	0	0	0
Illinois / 17	DuPage / 043	0	1	0	0	0	0	0
Illinois / 17	Grundy / 063	0	0	0	0	0	0	0
Illinois / 17	Kane / 089	0	1	0	0	0	0	1
Illinois / 17	Kendall / 093	0	0	0	0	0	0	0
Illinois / 17	Lake / 097	0	1	0	0	0	0	0
Illinois / 17	McHenry / 111	0	1	0	0	0	0	0
Illinois / 17	Will / 197	0	1	0	0	0	0	0
Indiana / 18	Jasper / 073	0	0	0	0	0	0	0
Indiana / 18	Lake / 089	5	3	0	0	1	2	4
Indiana / 18	Newton / 111	0	0	0	0	0	0	0
Indiana / 18	Porter / 127	1	2	0	0	0	0	1
Wisconsin / 55	Kenosha / 059	0	2	0	0	0	0	0
Totals		**9**	**22**	**2**	**4**	**3**	**5**	**9**
Federal Requirement		**2-4**	**3**	**3**	**1**	**1**	**3**	**1**

PM2.5 MSA Monitoring Network

State / FIPS State ID	County / FIPS County ID	Federal Reference Method PM2.5	Federal Equivalent Method Continuous PM2.5	Speciation PM2.5	Collocated PM2.5
Illinois / 17	Cook / 031	11	6	3	3
Illinois / 17	DeKalb / 037	0	0	0	0
Illinois / 17	DuPage / 043	1	0	1	0
Illinois / 17	Grundy / 063	0	0	0	0
Illinois / 17	Kane / 089	1	1	0	0
Illinois / 17	Kendall / 093	0	0	0	0
Illinois / 17	Lake / 097	0	0	0	0
Illinois / 17	McHenry / 111	0	1	0	0
Illinois / 17	Will / 197	1	1	0	0
Indiana / 18	Jasper / 073	0	0	0	0
Indiana / 18	Lake / 089	5	2	1	1
Indiana / 18	Newton / 111	0	0	0	0
Indiana / 18	Porter / 127	1	1	0	0
Wisconsin / 55	Kenosha / 059	1	0	0	0
Totals		**21**	**12**	**5**	**4**
Federal Requirement		**3***	**3***	**2**	**2**

*Requirement for either FRM or FEM monitors.


WISCONSIN
ILLINOIS
INDIANA
Kenosha
Lake
McHenry
DeKalb
Kane
DuPage
Kendall
Will
Grundy
Lake
Porter
Newton
Jasper
Lake Michigan
Type(s) of Monitoring
CO
CO, NO2 and PM2.5
CO, O3, PM10, PM2.5 and SO2
Lead
Lead, SO2 and O3
Lead and PM10
Lead, PM10 and PM2.5
NO2
NO2 and O3
NO2, O3 and PM2.5
NO2, O3, PM2.5 and SO2
O3
O3 and PM2.5
O3 and SO2
O3, PM10, PM2.5 and SO2
PM10
PM10 and PM2.5
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III. LIMITATIONS

a. All commitments made in this MOA are subject to the availability of appropriated funds and each agency's budget priorities. Nothing in this MOA obligates any of the PARTIES to expend appropriations or to enter into any contract, assistance agreement, interagency agreement, or other financial obligation.

b. This instrument is neither a fiscal nor a funds obligation document. Any endeavor or transfer of anything of value involving reimbursement or contribution of funds between PARTIES to this instrument shall be handled in accordance with applicable laws, regulations, and procedures including those for government procurement. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the PARTIES and shall be independently authorized by appropriate statutory authority. This instrument does not provide such authority. Specifically, this instrument does not establish authority for non-competitive award to the cooperator of any contract or other agreement. Any contract or agreement for work or other services must fully comply with all applicable requirements for competition.

c. This MOA does not bind the PARTIES to any requirements to which each PARTY would not otherwise be subject but for this MOA.

d. This MOA does not create any right or benefit enforceable by law or equity against the PARTIES, their officers or employees, or any other person. This MOA does not apply to any entity outside the PARTIES.

e. No proprietary information or intellectual property is anticipated to arise out of this MOA.

IV. TERMINATION

This MOA is effective through December 31, 2021, unless revised or terminated. This MOA may be revised upon the mutual written consent of all the PARTIES. Each party reserves the right to terminate this MOA. Such action will terminate this MOA for all affected agencies. A thirty (30) day written notice must be given prior to the date of termination.

IN WITNESS WHEREOF, the PARTIES hereto have executed this agreement:

Illinois Environmental Protection Agency

BY: _____
Alec Messina

TITLE: Director, Illinois Environmental Protection Agency

DATE: 4/14/17

IN WITNESS WHEREOF, the PARTIES hereto have executed this agreement:

Indiana Department of Environmental Management
Office of Air Quality

BY: Keith Baugues
Keith Baugues

TITLE: Assistant Commissioner, Office of Air Quality

DATE: 6-5-17

IN WITNESS WHEREOF, the PARTIES hereto have executed this agreement:

Wisconsin Department of Natural Resources

BY: _____
Cathy L. Stepp

TITLE: Secretary, Wisconsin Department of Natural Resources

DATE: May 25, 2017

Appendix D

2024 Air Monitoring Site Descriptions

Summary

This appendix provides details on the monitoring sites operated by DNR. Each site page includes the site name, AQS site ID, county, city, address, operating schedule, latitude, longitude, elevation and year established. A state map at the top of the page provides the approximate location of the monitoring site. A smaller scale map at the bottom of the page indicates the major roadways or other geographic features that are near the site. A table of monitoring parameters tracked in the annual network plan indicates which parameters operate at the site along with their season, frequency and monitoring objectives. A short description of the site is included along with a picture. If there are any proposed changes to a site, an additional section detailing those changes is included.

Federal Regulation

40 CFR § 58.10(a)(1) Beginning July 1, 2007, the state, or where applicable local, agency shall submit to the Regional Administrator an annual monitoring network plan which shall provide for the documentation of the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations that can include FRM, FEM, and ARM monitors that are part of SLAMS, NCore, CSN, PAMS, and SPM stations. The plan shall include a statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D, and E of this part, where applicable. The Regional Administrator may require additional information in support of this statement. The annual monitoring network plan must be made available for public inspection and comment for at least 30 days prior to submission to the EPA and the submitted plan shall include and address, as appropriate, any received comments

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Appleton AAL

Site Information

AQS Site ID: 55-087-0009

County: Outagamie

City: Appleton

Address: 4579 N Meade St.

Operation: Year-round

Latitude: 44.30738

Longitude: -88.39509

Elevation: 240 (m)

Year Established: 1995

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC	YC, YC							
Objectives	P	G, Q							

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: $PM_{2.5}$ is collocated FEM/FEM

Site Description:

This urban site is located in an Appleton neighborhood. The sample inlets are about 5 meters above ground level and 9-10.3 meters from nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Planned Changes

- New shelter installation planned in 2023, current shelter relocating to Kewaunee

Bad River Tribal School-Odanah

Site Information

AQS Site ID: 55-003-0010

County: Odanah

City: Ashland

Address: 53751 Pine St.

Operation: Year-round

Latitude: 46.60234

Longitude: -90.65615

Elevation: 188 (m)

Year Established: 2002

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	YC	YC					YC*		*
Objectives	G	G							

Frequency: Y = Year-round, S = Seasonal, C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD, BP, RH, temperature, solar radiation and precipitation; Other includes NADP biweekly composite AMoN

Site Description:

This tribal site is located on the Bad River Reservation adjacent to the Tribal School. The sample inlets are 220 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Bayside

Site Information

AQS Site ID: 55-079-0085

County: Milwaukee

City: Bayside

Address: 601 E. Ellsworth Ln.

Operation: Seasonal

Latitude: 43.18100

Longitude: -87.90100

Elevation: 204 (m)

Year Established: 1984

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC								
Objectives	P								

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments:

Site Description:

This urban site is located in Milwaukee county in the community of Bayside. This site is located inside the Bayside Middle School in the boiler room. The sample inlet is 6.5 meters above ground level and 258 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Beloit-Converse

Site Information

AQS Site ID: 55-105-0030

County: Rock

City: Beloit

Address: 1501 Ritsher St.

Operation: Seasonal

Latitude: 42.51831

Longitude: -89.06360

Elevation: 243(m)

Year Established: 2013

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC								
Objectives	M, R								

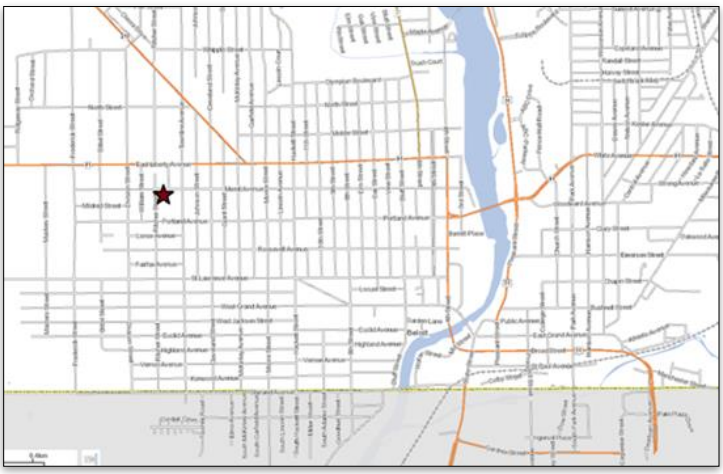
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments:

Site Description:

This suburban site is located near the Converse Elementary School in Beloit. The sample inlet is 5 meters above ground level and 4.9 meters from nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Chiwaukee Prairie Stateline

Site Information

AQS Site ID: 55-059-0019

County: Kenosha

City: Pleasant Prairie

Address: 11838 First Court

Operation: Year-round

Latitude: 42.50472

Longitude: -87.80930

Elevation: 179 (m)

Year Established: 1988

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC	YC		SC		SC	YC*		
Objectives	M, R	R		R		SR			

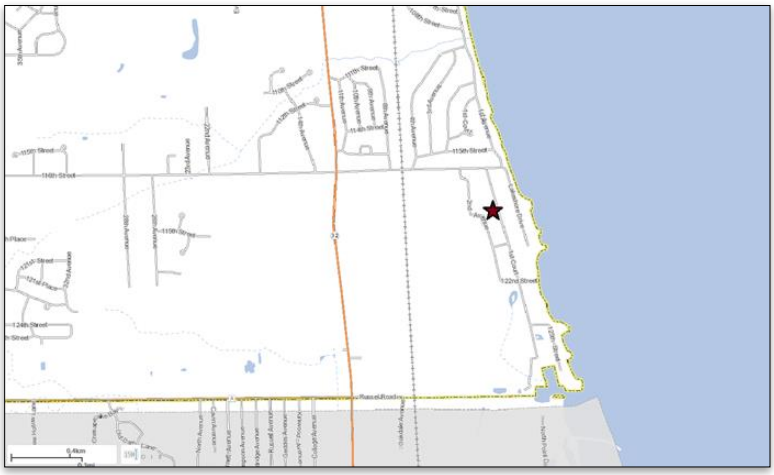
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD, temperature, solar radiation and seasonal precipitation

Site Description:

This rural site is located in the Chiwaukee Prairie, a rural area near the Wisconsin-Illinois border. The sample inlet is 8.5 meters above ground level and 13.7 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Columbus

Site Information

AQS Site ID: 55-021-0015

County: Columbia

City: Columbus

Address: N 1045 Wendt Rd.

Operation: Seasonal

Latitude: 43.31551

Longitude: -89.10889

Elevation: 307 (m)

Year Established: 1988

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC								
Objectives	M								

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments:

Site Description:

This rural site is located in Columbia county on Wendt Road. The sample inlet is 5 meters above ground level and 10 meters from nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Devil's Lake Park

Site Information

AQS Site ID: 55-111-0007

County: Sauk

City: Baraboo

Address: E12886 Tower Rd.

Operation: Year-round

Latitude: 43.43510

Longitude: -89.67979

Elevation: 383 (m)

Year Established: 1995

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC	YC	YC				YC*		Y*
Objectives	G	G	G	G					

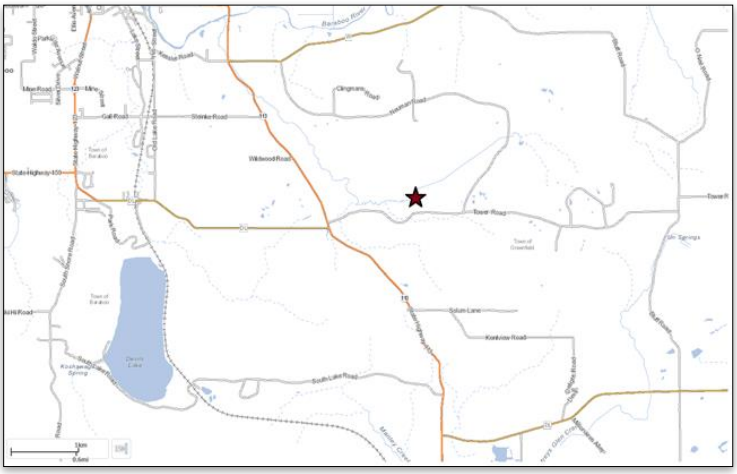
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD, and temperature; Other includes MDN and NTN composite samples collected weekly, PFAS study includes NTN, PFAS in precipitation and 3 collocated PUF+ samplers for PFAS in air method development study.

Site Description:

This rural site is located at Devils Lake State Park. The sample inlets range from 5-6.4 meters from the ground. The inlets are 200 meters from the nearest rural road and 1,380 meters from the nearest state road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Eau Claire – DOT Sign Shop

Site Information

AQS Site ID: 55-035-0014

County: Eau Claire

City: Eau Claire

Address: 5509 Highway 53 South

Operation: Year-round

Latitude: 44.76249

Longitude: -91.41445

Elevation: 277 (m)

Year Established: 2011

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC	YC	YC				YC*		
Objectives	M	H	H						

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD

Site Description:

This site is located in the corner of the parking lot of the Wisconsin State Patrol office, next to the DOT sign shop. The sample inlets range from 5.0 to 6.2 meters above ground level and 145 meters from the nearest roadway. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G

Elkhorn

Site Information

AQS Site ID: 55-127-0006

County: Walworth

City: Elkhorn

Address: W 3900 County Rd. NN

Operation: Seasonal

Latitude: 42.66218

Longitude: -88.48703

Elevation: 316 (m)

Year Established: 2019

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC								
Objectives	M								

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments:

Site Description:

This site is located on the eastern edge of Elkhorn in a rural area. The sample inlet is 5.2 meters above ground level and 44 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Fond du Lac

Site Information

AQS Site ID: 55-039-0006

County: Fond du Lac

City: Byron

Address: N3996 Kelly Rd.

Operation: Seasonal

Latitude: 43.68740

Longitude: -88.42205

Elevation: 322 (m)

Year Established: 1994

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC								
Objectives	M								

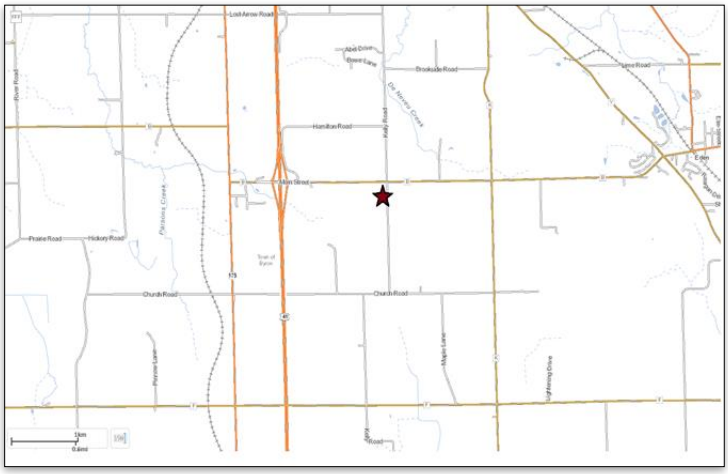
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments:

Site Description:

This rural site is located in a farm field in the rural town of Byron. The sample inlet is 5 meters above ground level and 32.5 meters from nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Grafton

Site Information

AQS Site ID: 55-089-0008

County: Ozaukee

City: Grafton

Address: 1866 N. Port Washington Rd

Operation: Year-round

Latitude: 43.34317

Longitude: -87.92087

Elevation: 230 (m)

Year Established: 1994

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC						SC*		
Objectives	R								

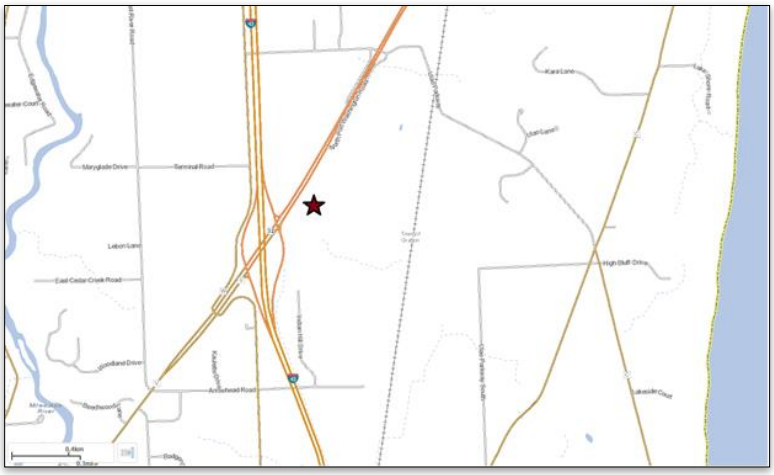
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD, BP, temperature with seasonal precipitation

Site Description:

This rural site is located off Highway I-43, next to the WE Energies landfill. The sample inlet is 5 meters above ground level and 44 meters from nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes

New shelter installation planned in fall of 2023.

Green Bay East High

Site Information

AQS Site ID: 55-009-0005

County: Brown

City: Green Bay

Address: 1415 Walnut St.

Operation: Year-round

Latitude: 44.50729

Longitude: -87.99344

Elevation: 180 (m)

Year Established: 1971

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency		YC							Y,6
Objectives		H							

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Other includes CSN on a 1/6 schedule

Site Description:

This site is located inside the Green Bay East High School and on the rooftop. The sample inlets are 11-15 meters above the ground and 85 meters from nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Green Bay UW

Site Information

AQS Site ID: 55-009-0026

County: Brown

City: Green Bay

Address: E. Circle Drive

Operation: Seasonal

Latitude: 44.53098

Longitude: -87.90799

Elevation: 213 (m)

Year Established: 1994

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC								
Objectives	P								

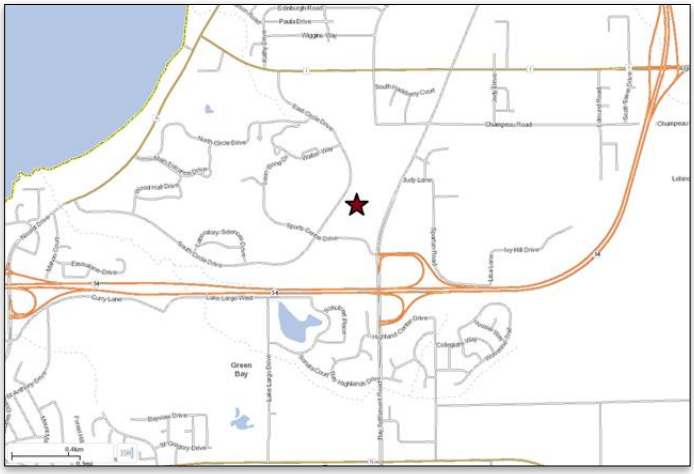
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments:

Site Description:

This site is located behind the University of Wisconsin—Green Bay campus. The sample inlet is 5 meters above ground level and 600 meters from nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G



Harrington Beach Park

Site Information

AQS Site ID: 55-089-0009

County: Ozaukee

City: Belgium

Address: 485 Hwy D

Operation: Year-round

Latitude: 43.49830

Longitude: -87.81020

Elevation: 208 (m)

Year Established: 1994

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC	YC					YC		YC*
Objectives	M	R							

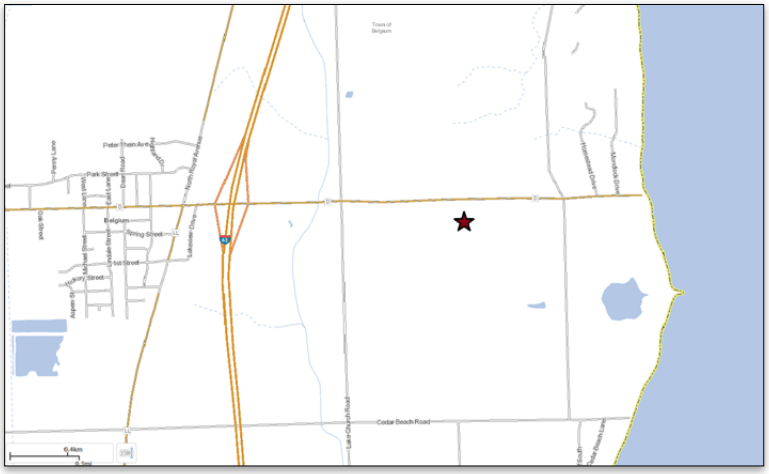
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD, and temperature; Other includes aethalometer measuring black carbon and UVPM

Site Description:

This rural site is located at the Harrington Beach State Park. The sample inlets range from 3-5 meters above ground level and 34 meters from nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Horicon Wildlife Area

Site Information

AQS Site ID: 55-027-0001

County: Dodge

City: Horicon

Address: 1210 N. Palmatory St.

Operation: Year-round

Latitude: 43.46611

Longitude: -88.62111

Elevation: 267 (m)

Year Established: 1982

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	YC	YC, Y3*	YC, Y6, Y6C*	YC	YC		YC*	Y*	Y*
Objectives	G	G, Q	G, G, Q	G	G				

Frequency: Y = Year-round, S = Seasonal, C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: $PM_{2.5}$ FEM primary, FRM secondary for NCore requirement; PM_{10} FEM primary, secondary FRMs for toxics; Met includes WS/WD, BP, RH, temperature with seasonal precipitation; Toxics include VOCs, carbonyls on a 1/6 schedule and QC samples as prescribed in the applicable QAPPs; Other includes year-round continuous NO_y; CSN on a 1/3 schedule.

Site Description:

This rural site is located at the Horicon Marsh State Wildlife Area. The sample inlets range from 3-10 meters above ground level and are 42 meters from a rural road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Jefferson-Laatsch

Site Information

AQS Site ID: 55-055-0009

County: Jefferson

City: Jefferson

Address: N4440 Laatsch Ln.

Operation: Seasonal

Latitude: 43.00340

Longitude: -88.82830

Elevation: 240 (m)

Year Established: 1994

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC								
Objectives	G, R								

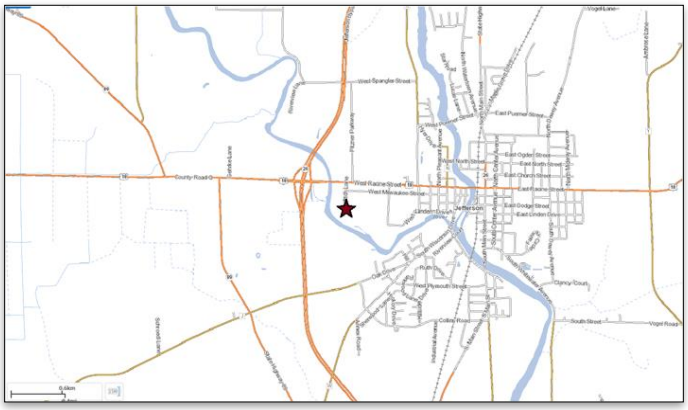
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments:

Site Description:

This site is at the end of Laatsch Lane and west of Jefferson Elementary School. The sample inlet is 4 meters above ground level and 90 meters from nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Kaukauna

Site Information

AQS Site ID: 55-087-0015

County: Outagamie

City: Kaukauna

Address: 601 Plank Rd.

Operation: Year-round

Latitude: 44.28930

Longitude: -88.25219

Elevation: 205 (m)

Year Established: 2017

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency					YC		YC*		
Objectives					S				

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD, temperature

Site Description:

This site is located north of the Ahlstrom-Munksjo Kaukauna facility at a quarry entrance on Plank Road. This site is within the area that was modeled to be the highest normalized design value for SO_2. The sample inlet is 5.8 meters above ground level and 10 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Kenosha-Water Tower

Site Information

AQS Site ID: 55-059-0025

County: Kenosha

City: Kenosha

Address: 4504 64th Ave.

Operation: Seasonal

Latitude: 42.59560

Longitude: -87.88576

Elevation: 222 (m)

Year Established: 2013

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC						SC*		
Objectives	P								

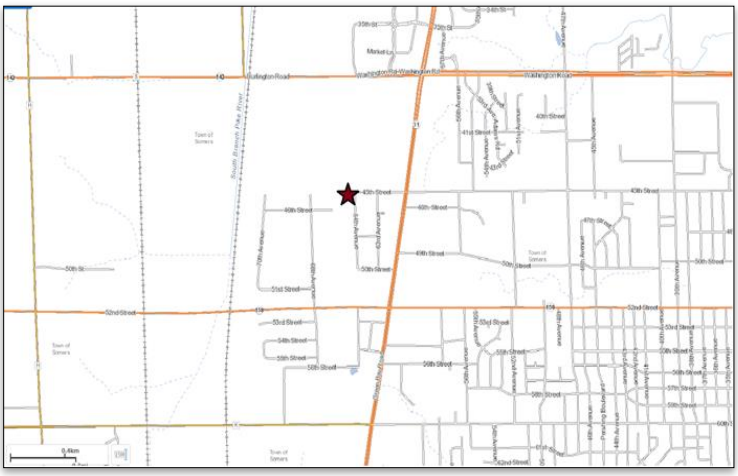
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD and temperature

Site Description:

This site is located just east of Green Bay Road and north of the City of Kenosha. The sample inlet is 5 meters above ground level and 36 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices A, C, D, E and G.



Planned Changes

- New shelter installation planned in 2023

Kewaunee

Site Information

AQS Site ID: 55-061-0002

County: Kewaunee

City: Kewaunee

Address: 1630 Milwaukee St.

Operation: Seasonal

Latitude: 44.44312

Longitude: -87.50525

Elevation: 203 (m)

Year Established: 1994

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC								
Objectives	R, M								

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments:

Site Description:

This site is located on a bluff over Lake Michigan next to an ATV/ lawn tractor dealer. The sample inlet is 6 meters above ground level and 83 meters from nearest road. Verified through annual DNR audits, the site meets the requirements Of 40 CFR 58, Appendices C, D, E and G.

Planned Changes

- New shelter installation planned in 2023

La Crosse-DOT Building

Site Information

AQS Site ID: 55-063-0012

County: La Crosse

City: La Crosse

Address: 3550 Mormon Coulee Rd.

Operation: Year-round

Latitude: 43.77750

Longitude: -91.2269

Elevation: 201 (m)

Year Established: 2005

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC	YC							
Objectives	M	H							

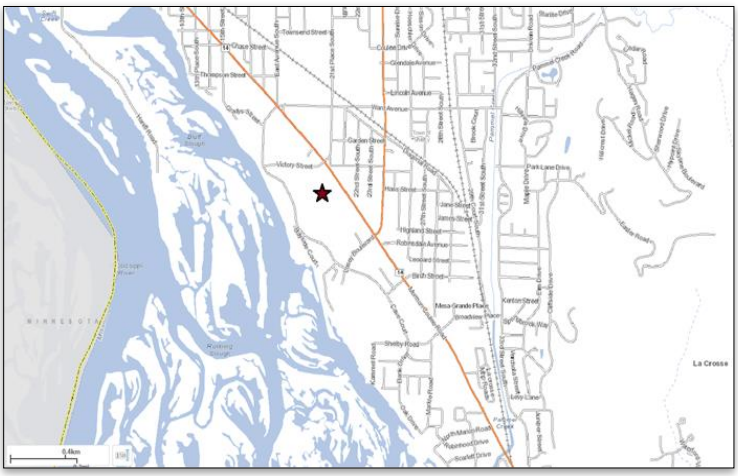
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments:

Site Description:

This site is located on a Wisconsin Department of Transportation lot. The sample inlets range from 5-6 meters above ground level and are 113 meters from nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Lake DuBay

Site Information

AQS Site ID: 55-073-0012

County: Marathon

City: Bergen

Address: 1804 Bergen Rd.

Operation: Seasonal

Latitude: 44.70735

Longitude: -89.77192

Elevation: 383 (m)

Year Established: 1991

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC								
Objectives	G								

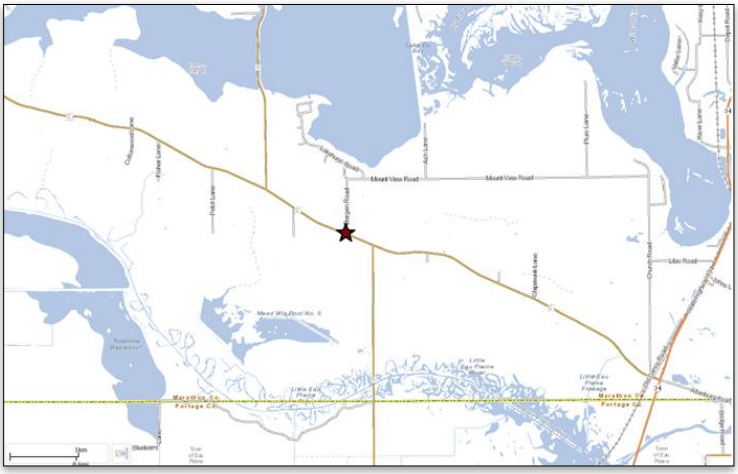
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments:

Site Description:

This site is located near Lake DuBay in Marathon County. The sample inlet is 5.4 meters above ground level and 16.8 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Madison East

Site Information

AQS Site ID: 55-025-0041

County: Dane

City: Madison

Address: 2302 Hoard St.

Operation: Year-round

Latitude: 43.10101

Longitude: -89.35768

Elevation: 259 (m)

Year Established: 1999

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC	YC, Y6					YC*		Y6
Objectives	P	P, Q							

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: $PM_{2.5}$ FEM is collocated FEM/FRM; Met includes WS/WD, temperature and seasonal precipitation, Other includes CSN on a 1/6 schedule

Site Description:

This urban site is located next to the Madison East High School Sports Field. The sample inlets range from 5-6.1 meters above ground level and 43 meters from nearest public road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Madison University Avenue Well #6

Site Information

AQS Site ID: 55-025-0047

County: Dane

City: Madison

Address: 2757 University Ave.

Operation: Year-round

Latitude: 43.07378

Longitude: -89.43595

Elevation: 266 (m)

Year Established: 1992

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency		YC	YC						
Objectives		H	P						

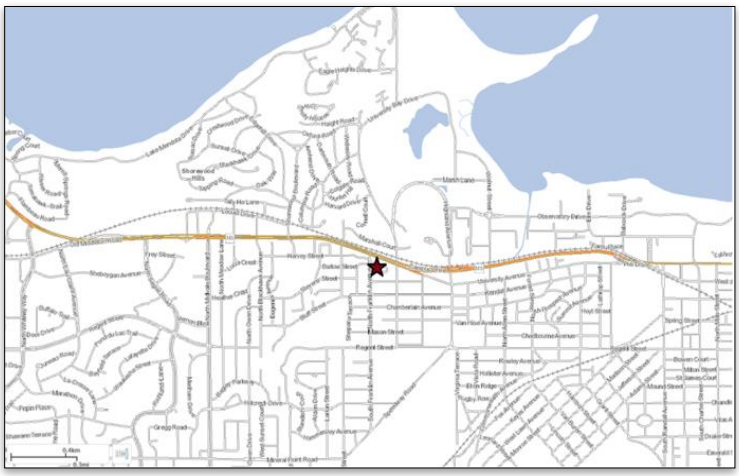
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments:

Site Description:

This urban site is located on top of a City of Madison building. The sampler inlet is 5 meters above ground level and 12 meters from nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Manitowoc Woodland Dunes

Site Information

AQS Site ID: 55-071-0007

County: Manitowoc

City: Two Rivers

Address: 2315 Goodwin Rd.

Operation: Seasonal

Latitude: 44.13862

Longitude: -87.61612

Elevation: 183 (m)

Year Established: 1994

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC						SC*		
Objectives	R								

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD and temperature

Site Description:

This rural site is located at the Woodland Dunes Nature Center & Preserve in Two Rivers. The sample inlet range from 6 meters above ground level and 20 meters from nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Milwaukee-College Ave. NR

Site Information

AQS Site ID: 55-079-0056

County: Milwaukee

City: Milwaukee

Address: 1550 W. College Ave.

Operation: Year-round

Latitude: 42.93257

Longitude: -87.93434

Elevation: 228 (m)

Year Established: 2013

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency		YC	YC	YC		YC	YC*		YC*
Objectives		P	P	M		H			

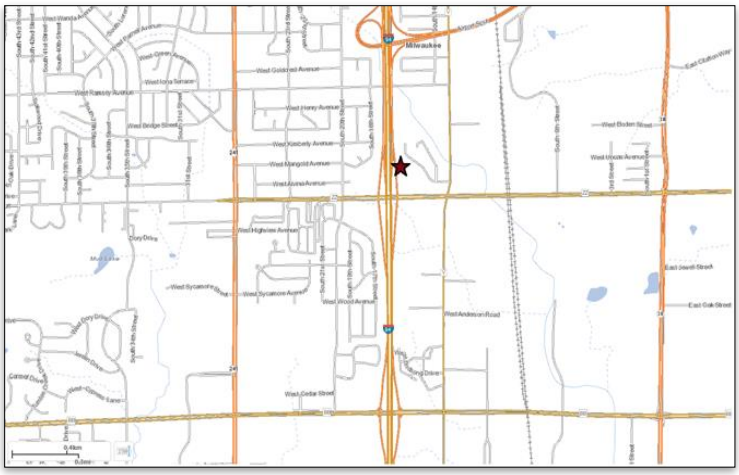
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD and temperature; Other includes aethalometer measuring black carbon and UVPM

Site Description:

This near-road site is located near the I-94 entrance ramp at College Avenue in the Park and Ride area. The sample inlets are 5 meters above ground level and 14 meters from nearest road. Given its proximity to a major interstate, this site is influenced by transportation pollution sources. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Milwaukee Sixteenth St. Health Center

Site Information

AQS Site ID: 55-0079-0010

County: Milwaukee

City: Milwaukee

Address: 1337 S. 16th St

Operation: Year-round

Latitude: 43.01724

Longitude: -87.93369

Elevation: 192 (m)

Year Established: 1997

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	YC	YC, Y3	Y6, Y6					Y*	Y,6*
Objectives	P	H, Q	P, Q						

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: $PM_{2.5}$ is collocated FEM/FRM; $PM_{2.5}$ FRM on a 1/3 frequency due to being an STN CSN site; PM_{10} is collocated FRM/FRM; Toxics include VOCs, carbonyls and metals on a 1/6 schedule and QC samples as prescribed in the applicable QAPPs; Other includes CSN on a 1/3 schedule and Hg monitoring

Site Description:

This urban site is located on the roof of the Health Center Building on the corner of S Cesar E. Chavez Dr. (16th St.) and Greenfield Ave. Sample inlets are 10-14 meters above ground level and 12 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Milwaukee UWM UPark

Site Information

AQS Site ID: 55-079-0068

County: Milwaukee

City: Milwaukee

Address: 4372 N. Humboldt Blvd.

Operation: Year-round

Latitude: 43.09456

Longitude: -87.90144

Elevation: 184 (m)

Year Established: 2021

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC				YC	YC	YC*		
Objectives	P				P	P			

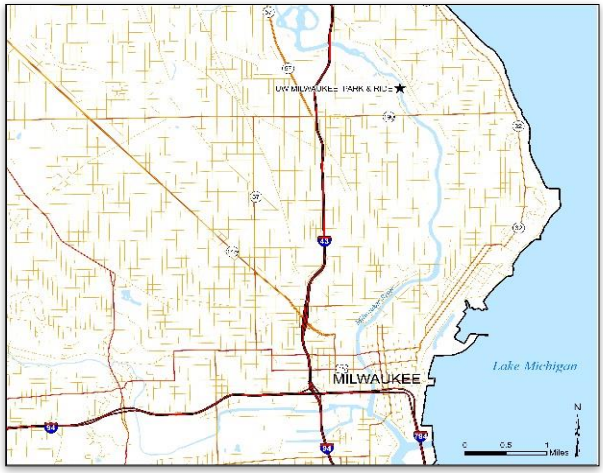
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD, temperature and BP, Ozone is being proposed for seasonal operation

Site Description:

This urban site is installed in the UW-Milwaukee Park & Ride lot. Sample inlets are 5 meters above ground and 119 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Newport Park

Site Information

AQS Site ID: 55-029-0004

County: Door

City: Ellison Bay

Address: 475 Newport Park Rd

Operation: Seasonal

Latitude: 45.23840

Longitude: -86.99400

Elevation: 192 (m)

Year Established: 1989

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC						SC*		
Objectives	R								

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD, and temperature

Site Description:

This rural site is located inside the Newport State Park. The sample inlet is 12 meters above ground level and 250 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Perkinstown

Site Information

AQS Site ID: 55-119-8001

County: Taylor

City: Taylor

Address: W10746 Cty Rd. M

Operation: Year-round

Latitude: 45.20660

Longitude: -90.59720

Elevation: 462 (m)

Year Established: 1988

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency		YC							Y
Objectives		G							

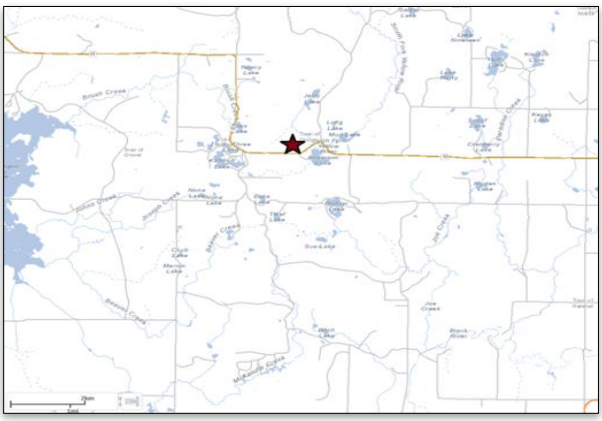
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Other includes NADP biweekly composite AMoN,

Site Description:

This site is located on private property 1 mile east of the town of Perkinstown. The sample inlets are 3 meters above ground level and 380 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G. EPA also operates a CASNET ozone monitor at site.



Potawatomi

Site Information

AQS Site ID: 55-041-0007

County: Forest

City: Crandon

Address: Fire Tower Rd.

Operation: Year-round

Latitude: 45.56498

Longitude: -88.80859

Elevation: 556 (m)

Year Established: 2002

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	YC	YC			Y0		Y0*		*
Objectives	G	G			G				

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD, RH, and temperature; Other includes NTN and MDN composite samples collected weekly

Site Description:

This tribal site is located on the Forest County Potawatomi Community reservation. The sample inlets range from 2-6 meters above ground level and are 200 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Potosi

Site Information

AQS Site ID: 55-043-0009

County: Grant

City: Potosi

Address: 128 Hwy 61

Operation: Year-round

Latitude: 42.69302

Longitude: -90.69813

Elevation: 298 (m)

Year Established: 1999

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency		YC							
Objectives		R							

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments:

Site Description:

This site is located at the Potosi High School grounds. The sample inlets are 5 meters above ground level and 100 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Racine-Payne and Dolan

Site Information

AQS Site ID: 55-101-0020

County: Racine

City: Racine

Address: 4500 Charles St.

Operation: Seasonal

Latitude: 42.77719

Longitude: -87.79675

Elevation: 190 (m)

Year Established: 2015

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC								
Objectives	M, R								

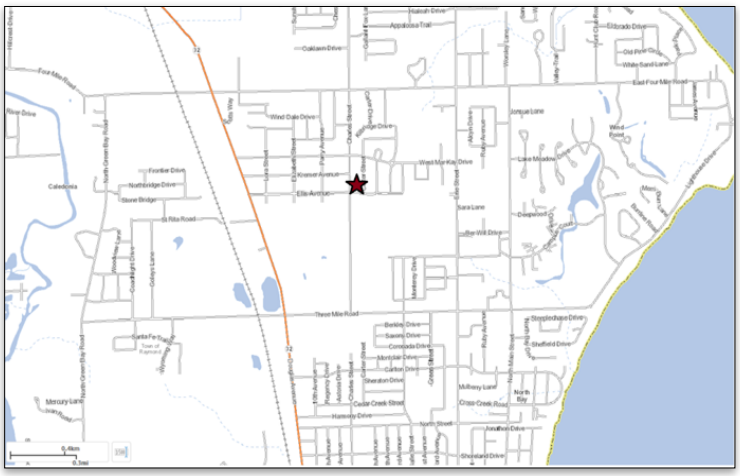
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments:

Site Description:

This site is located next to a farm field in the rural village of Caledonia. The sample inlet is 4.9 meters above ground level and 20 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Rhinelander

Site Information

AQS Site ID: 55-085-0996

County: Oneida

City: Rhinelander

Address: 434 High St.

Operation: Year-round

Latitude: 45.64510

Longitude: -89.41848

Elevation: 490 (m)

Year Established: 1981

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency					YC		YC*		
Objectives					H, S				

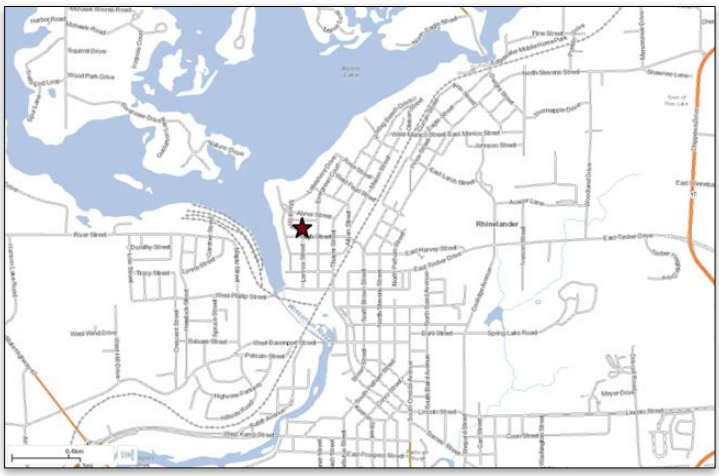
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD and temperature

Site Description:

This site is located next to the Water Tower property accessed on Morrill St. The sample inlet is 5 meters above ground level and 30.5 meters from the nearest road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Sheboygan Haven

Site Information

AQS Site ID: 55-117-0009

County: Sheboygan

City: Sheboygan

Address: N7563 Hwy 42

Operation: Seasonal

Latitude: 43.81560

Longitude: -87.79223

Elevation: 224 (m)

Year Established: 2014

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC						SC*		
Objectives	P								

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD, and temperature

Site Description:

This site is located at a rural setting. The sample inlet is 5 meters above ground level and 61 meters from nearest public road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices A, C, D, E and G.

Sheboygan Kohler Andrae

Site Information

AQS Site ID: 55-117-0006

County: Sheboygan

City: Sheboygan

Address: 1520 Beach Park Rd.

Operation: Seasonal

Latitude: 43.66737

Longitude: -87.71631

Elevation: 180 (m)

Year Established: 1997

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC						SC*		
Objectives	R, M								

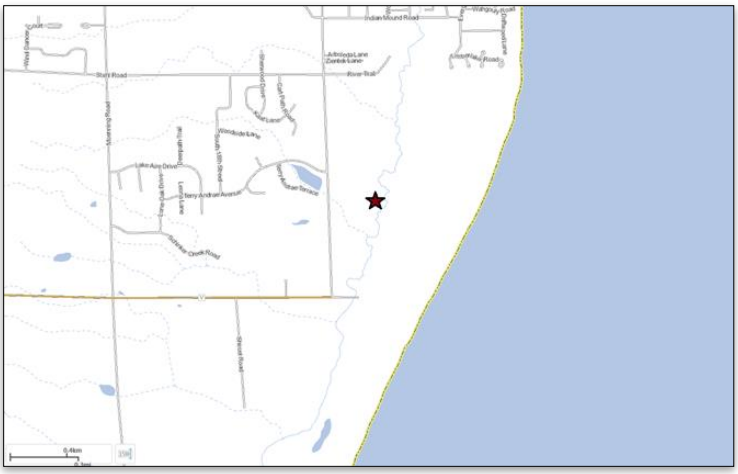
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Met includes WS/WD and temperature

Site Description:

This site is located inside the nature center along the shore of Lake Michigan at the Kohler-Andrae State Park. The sample inlet is 6.4 meters above ground level and 482 meters from the nearest service road and 747 meters from the nearest public road. Verified through annual DNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Trout Lake

Site Information

AQS Site ID: 55-125-0001

County: Vilas

City: Boulder Junction

Address: 10810 County Hwy M.

Operation: Year-round

Latitude: 46.05200

Longitude: -89.65405

Elevation: 500 (m)

Year Established: 2002

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC	YC							*
Objectives	G	G							

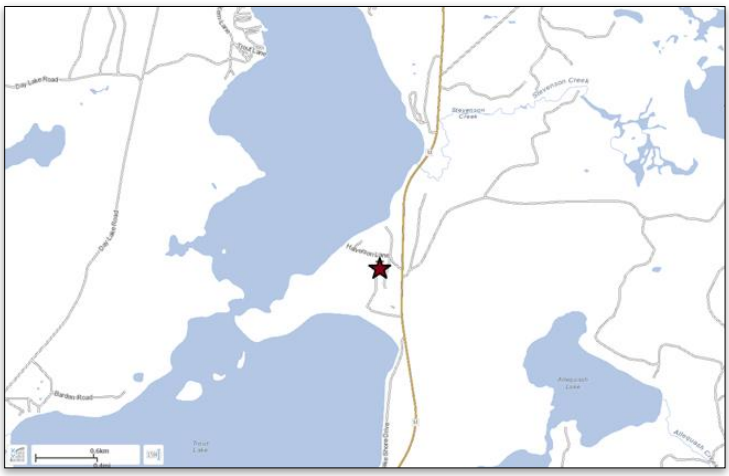
Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: Other includes MDN and NTN composite samples collected weekly

Site Description:

This rural site is located in a field at the DNR Forestry Site on County M, Boulder Junction. The sample inlets range from 5-6 meters above ground level and 36.5 meters from the nearest road. Verified through annual DNR audits, the site meets the requirement of 40 CFR 58, Appendices C, D, E and G



Waukesha-Cleveland Ave.

Site Information

AQS Site ID: 55-133-0027

County: Waukesha

City: Waukesha

Address: 1310 Cleveland Ave.

Operation: Year-round

Latitude: 43.02012

Longitude: -88.21505

Elevation: 262 (m)

Year Established: 1989

Monitoring Parameters

	O_3	$PM_{2.5}$	PM_{10}	CO	SO_2	NO_2	Met	Toxics	Other
Frequency	SC	Y0, Y6	Y0				YC*		
Objectives		H, Q	H						

Frequency: S = Seasonal, Y = Year-round
C = Continuous, 1 = Daily, 3 = 1/3, 6 = 1/6, 12 = 1/12, 30 = Monthly, 60 = Bimonthly, 90 = Quarterly

Objectives: G = General/Background, H = Highest Concentration, M = Max Ozone Concentration, NA = Not Applicable, O = Other, P = Population Exposure, Q = Quality Assurance, R = Regional Transport, S = Source Oriented

Comments: $PM_{2.5}$ is collocated FEM/FRM; Met includes WS/WD, temperature and BP

Site Description:

This urban site is located in a fenced-in area on a city lot in Waukesha County. The sample inlets are 5 meters above ground level and 6 meters from the nearest road. Verified through annual DNR audits, the site meets the requirement of 40 CFR 58, Appendices C, D, E and G.

Appendix E:
Enhanced Ozone Monitoring Plan

Introduction

As required by 40 CFR Part 58 Appendix D 5(h), DNR is providing an enhanced ozone monitoring plan (EMP). Appendix D (5)(h) states, in part:

The EMP will include monitoring activities deemed important to understanding the Ozone (O_3) problems in the state. Such activities may include, but are not limited to, the following:

(1) Additional O_3 monitors beyond the minimally required under paragraph 4.1 of this appendix,

(2) Additional NO_X or NO_y monitors beyond those required under 4.3 of this appendix,

(3) Additional speciated VOC measurements including data gathered during different periods other than required under paragraph 5(g) of this appendix, or locations other than those required under paragraph 5(a) of this appendix, and

(4) Enhanced upper air measurements of meteorology or pollution concentrations.

Overview

EPA approved an enhanced ozone monitoring plan as part of its approval of Wisconsin's 2020-2023 ANPs. As part of its continued requirement to perform enhanced ozone monitoring, DNR plans to:

- Continue the operation of ozone and ozone precursor monitors (CO, NO_x, carbonyls and VOCs) beyond those minimally required.
- Engage and support external partners collecting ozone-related data.

Details on these activities are provided below. Taken together, these efforts should provide additional insights into the mechanisms and dynamics of ozone formation and transport along Wisconsin's Lake Michigan lakeshore, will help advance DNR's understanding of the ozone challenges in Wisconsin, improve modeling in the region and will support future regulatory submittals related to ozone.

<u>Monitoring of ozone and ozone precursors beyond federal requirements</u>

In advance of each ozone season, DNR works with EPA and external partners to review data generated by enhanced ozone monitoring and to effectively focus resources for the upcoming ozone season. This review is completed with research and policy decisions in mind, to best meet Wisconsin's EOM goals

DNR is conducting enhanced ozone monitoring at two sites located inland from the Lake Michigan shoreline: Sheboygan Haven (55-117-0009) and Kenosha Water Tower (55-059-0025). These sites are not required by federal rule to meet minimum monitoring requirements (see Appendix B: Wavers and Approvals). DNR has been monitoring ozone at these locations since 2013 (Kenosha Water Tower) and 2014 (Sheboygan Haven) for the express purpose of better understanding the lakeshore impact on ozone concentrations along Lake Michigan's western coast. These sites are located 3.2 to 3.6 miles inland from monitors along the shoreline. Ozone concentration gradients have been extrapolated from the comparison of the two monitors.

Monitoring ozone precursors provides insight to contributing conditions of ozone formation near the lakeshore. Milwaukee UWM UPark site (55-079-0068) is a population based site that operates a year-round NOx (CAPS) monitor.The Chiwaukee site (55-059-0019) operates a seasonal NO_2 (CAPS) monitor from May to August paired with a seasonal CO monitor. Research partners and DNR have identified the value of using CO as an air mass tracing pollutant. As a result, DNR added a trace CO monitoring instrument to Chiwaukee in 2021.

DNR continues long term monitoring of the concentrations of volatile organic compounds (VOCs) and carbonyls at two locations: Milwaukee 16th Street Health Center (55-079-0010) and Horicon (55-027-0001). The Milwaukee 16th street Health Center site is part of the Urban Air Toxics Monitoring program (UATM). These two sites provide some compounds of interest within these toxics networks (i.e. formaldehyde, acetaldehyde) that are important ozone precursors. When compared with lakeshore VOC and carbonyl measurements, the formaldehyde and acetaldehyde datasets can be used to better contextualize the concentrations and chemistry dynamics across the different Wisconsin environments (background, urban, lakeshore).

Data analysis of speciated ozone event-based VOC and carbonyls has shown limitations of speciated sampling in a rural environment and has helped policymakers in the region understand the over-lake NOX/VOC gradient dynamics. Further data analysis will continue. DNR does not intend to include ozone event-based VOC or carbonyl sample collections in the 2023 EOM plan.

<u>Engaging and supporting external partners collecting ozone-related data</u>

DNR also will continue engaging external partners and agencies that are researching ozone issues in Wisconsin through field activities. The specific activities that will be undertaken each year are subject to partner resource availability and program priorities, but can include the following:

- Collection of ozone-related data using nontraditional methods, such as drones and ships.
- Operation of Pandora and Aeronet monitors at lakeshore locations to help determine the levels of NO_2 and formaldehyde in the boundary layer column.
- Wind Lidar measurements to help determine emission mapping and trajectories.
- Real time continuous VOC monitoring using Proton Transfer Reaction – Mass Spectrometry (PTR-MS).

<u>Historical enhanced ozone collarborations and campaigns</u>

In 2017, the LMOS campaign was a collaborative, multi-agency field study of ozone chemistry and meterology along the Wisconsin-Illionois Lake Michigan shoreline using a combination of aircraft, ground-based and ship-based measurements. Field activities were conducted May 22 through June 22,

2017. The campaign was conducted by researchers from three federal agencies and five research universities, in collaboration with the Lake Michigan Air Directors Consortium. Measurements focused on the Lake Michigan shoreline between Sheboygan, WI and Chicago, IL and addressed all four types of measurement suggested in 40 CFR Appendix D (5)(h).

In 2019, DNR deployed its mobile monitoring trailer (MAML) at two different locations with the goal to better understand lakeshore gradients in WI. Event based VOC samples were collected and analyzed for photochemical assessment monitoring station (PAMS) compounds. In 2020, the mobile trailer was deployed near the lakeshore in Sheboygan paired with additional VOC sampling capability at Chiwaukee (55-059-0019), but equipment availability due to COVID-19 limited the state to carbonyl sampling only.

Quality Assurance/Quality Control (QA/QC) Program

The purpose of the QA/QC program is to assure the quality of data obtained from the DNR air monitoring sites. The DNR meets or exceeds the QA requirements defined in 40 CFR 58 and all applicable appendices.

The QA/QC program includes but is not limited to the following activities:

- Monitor siting evaluations
- Zero, precision and span checks
- Bias determinations
- Flow rate audits
- Leak checks
- Data validation

As the Primary Quality Assurance Organization (PQAO) for ambient air monitoring activities in Wisconsin, the DNR operates under an EPA approved Quality Management Plan (QMP) and uses Quality Assurance Project Plans (QAPP) for each statewide monitoring network. The primary purpose of the QAPP is to provide an overview of the project, describe the need for the measurements, and define QA/QC activities to be applied to the project. All other ambient air monitoring initiatives including state, tribal, and industrial projects must have a DNR approved monitoring plan for each specific project.

Data produced by external research partners may use equipment and methods that are not commonly used by DNR. DNR may cooperate with or provide some oversight of these activities. The external partners are expected to operate independently to produce usable data and maintain their own quality documentation. DNR may use this data in its decision making, as deemed appropriate.

Data Processing and Reporting

Ambient air quality data are stored in a centralized server located at the Wisconsin Department of Administration. Continuous pollutant monitoring data are retrieved hourly and posted to the DNR Air Quality website (https://airquality.wi.gov/) and sent to EPA's AirNow web site (https://gispub.epa.gov/airnow/).

Due to the interest from the public and reseachers the DNR began sharing EOM data via the Widen platform. The data collection primarily consists of raw data sets and interim draft analysis. The EOM Collection portal to Widen is available on the DNR Air Quality Monitoring website. (https://dnr.wisconsin.gov/topic/AirQuality/MonitorMap.html)

Network Changes

Changes to the Enhanced Ozone Monitoring Network are intended to improve the effectiveness of monitoring efforts. This section of the document contains all changes that are planned for May 1, 2023 through December 31, 2024.

Proposed Network Changes (May 1, 2023 – December 31, 2024)

Enhancements needed to support Wisconsin's enhanced ozone monitoring efforts during the 2023 ozone season are detailed in this section. Following the conclusion of the 2023 ozone season, data will be reviewed to determine the configuration of the enhanced ozone monitoring network for the 2024 ozone season. This approach allows DNR to ensure an up-to-date, scientific approach to this critical work.

Appendix F:

Planned and Actual Changes from the 2023 Air Monitoring Network Plan

Summary

Each annual network plan includes anticipated changes to the network since the last network plan during approximately the next eighteen months ending on December 31 of the year specified in the network plan title. Table 1 lists the proposed network changes from the 2023 Network Plan by parameter network. Table 2 lists the actual network changes that occurred through April 1, 2023 by parameter network.

Federal Regulation

Requirements to submit network change information are found in a number of places in 40 CFR including: §58.10(a)(2), §58.10(e), §58.10(b)(5), §58.14(a), §58.14(b) and §58.14(c).

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Table 1: Planned Network Changes from the 2023 Air Monitoring Network Plan

May 1, 2022 – December 31, 2023

Monitoring Site	AQS Site ID	Site	Ozone	$PM_{2.5}$	PM_{10}	$PM_{10-2.5}$	SO_2	NO_2	CO	Meteorological	Metals (PM_{10})	NOy	PAH	VOC / Carbonyl	Hg	AmoN	MDN	NTN	CSN
Brule River	N/A																M2	M2	
Green Bay East	55-009-0005						T								T				
Horicon	55-027-0001										T		T	T	T				
Madison East	55-025-0041						T												
Milwaukee UWM UPark	55-079-0068		M1																

A = Addition
M = Modification
T = Termination

1=Change year-round monitor to seasonal
2=Transfer of ownership

Table 2: Actual Network Changes from the 2023 Air Monitoring Network Plan

Monitoring Site	AQS Site ID	Site	Ozone	$PM_{2.5}$	PM_{10}	$PM_{10-2.5}$	SO_2	NO_2	CO	Meteorological	Metals (PM_{10})	NOy	PAH	VOC / Carbonyl	Hg	AmoN	MDN	NTN	CSN
Brule River	N/A																T2	T2	
Chiwaukee Prairie Stateline	55-059-0019											T							
Green Bay East	55-009-0005						T								T				
Harrington Beach	55-089-009									T3									
Horicon	55-027-0001										T		T		T	T			
Madison East	55-025-0041						T												A
Milwaukee UWM UPark	55-079-0068		M1																
Perkinstown	55-119-8001																		T

A = Addition
M = Modification
T = Termination

1=Change year-round monitor to seasonal
2=Transfer of ownership
3=Barometric Pressure

Appendix G:
SO_2 Data Requirements Rule Emissions Assessment

Summary

Section 51.1205(b) of EPA's SO2 Data Requirements Rule (DRR) (40 CFR 51 Subpart BB) requires Wisconsin to submit an annual report to the Regional Administrator that documents the annual SO_2 emissions of each applicable source in each area where modeling of actual SO_2 emissions served as the basis for designating such area as attaining the 2010 1-hour SO_2 NAAQS. This report is to be submitted by July 1 of each year and must provide an assessment of the cause of any emissions increases and a recommendation regarding the need for additional modeling to determine if the areas are still meeting the 2010 1-hour SO_2 NAAQS.

Marathon County is the only attainment/unclassifiable area in Wisconsin that remains subject to this annual DRR verification requirement.

Emissions Data

The table below shows annual SO_2 emissions for Marathon County for 2013 through 2022. Annual SO_2 emissions are listed for the DRR-identified source in the area (the WPSC-Weston Plant), along with the other two sources that were included in the DRR modeling. Consistent with the DRR, actual emissions from 2013-2015 were used in the modeling of this area submitted to EPA in January 2016.

SO_2 emissions inventory data for Marathon County (tons per year)

FID	FACILITY NAME	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
737009020	WISCONSIN PUBLIC SERVICE CORPORATION - WESTON PLANT	7120	5521	4099	1337	615	669	663	589	714	676
737009570	EXPERA SPECIALTY SOLUTIONS - MOSINEE	1381	1461	1498	1469	1496	1529	1520	1085	1099	1106
737010450	DOMTAR PAPER COMPANY LLC	28	27	29	26	27	23	25	16	19	19
	AREA TOTAL	8529	7009	5626	2832	2138	2221	2208	1690	1832	1801

Analysis and Recommendation

Annual SO_2 emissions from the modeling domain in the Marathon County attainment/unclassifiable area were 1801 tons in 2022. This is 79% lower than 2013 emissions and 68% lower than 2015 emissions (the years modeled to satisfy Round 3 DRR requirements). Given the significant decrease in SO_2 emissions, the DNR concludes that no additional modeling for the Marathon County attainment/unclassifiable area is necessary to satisfy ongoing DRR requirements.