

Indiana
2012
Ambient Air Monitoring
Network Plan



Indiana Department of Environmental Management
Office of Air Quality
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Acronyms

AADT	Annual Average Daily Traffic
APCD	Louisville Metropolitan Air Pollution Control District
AQS	Air Quality System
BAM	Beta Attenuation Monitor
CBD	Central Business District
CBSA	Core Based Statistical Area
CFR	Code of Federal Regulations
CSA	Combined Statistical Area
CO	Carbon Monoxide
DNPH	2,4-Dinitrophenylhydrazine
DV	Design Value
FDMS	Filter Dynamic Measurement System
FEM	Federal Equivalent Method
FID	Flame Ionization Detector
FRM	Federal Reference Method
GC/MS	Gas Chromatograph / Mass Spectrometry
HCDOES	Hamilton County (OH) Department of Environmental Services
HPLC	High Pressure Liquid Chromatography
ICP/MS	Inductive Coupled Plasma / Mass Spectrometry
IDEM	Indiana Department of Environmental Management
IMPROVE	Interagency Monitoring of Protected Visual Environments
KDEP	Kentucky Department for Environmental Protection
LADCO	Lake Michigan Air Directors Consortium
LEADS	Leading Environmental Analysis and Display System
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standard
NAMS	National Air Monitoring Station
NATTS	National Air Toxics Trends Station
NCore	National Core multi-pollutant monitoring stations
NO	Nitric Oxide
NO ₂	Nitrogen Dioxide
NO _x	Oxides of Nitrogen
NO _y	Total Reactive Nitrogen Oxides
NOAA	National Oceanic and Atmospheric Administration
O ₃	Ozone
PAMS	Photochemical Assessment Monitoring Station
Pb	Lead
PM _{2.5}	Particulate matter with a diameter less than or equal to 2.5 micrometers
PM ₁₀	Particulate matter with a diameter less than or equal to 10 micrometers
PM _{10-2.5}	Particulate matter with a diameter less than or equal to 10 micrometers, and greater than or equal to 2.5 micrometers
ppb	parts per billion
ppm	parts per million
PQAO	Primary Quality Assurance Organization
PSD	Prevention of Significant Deterioration
PTFE	Polytetrafluoroethylene
PWEI	Population Weighted Emissions Index
QA	Quality Assurance
SASS	Speciation Air Sampling System
SHARP	Synchronized Hybrid Ambient Real-time Particulate
SLAMS	State or Local Air Monitoring Stations
SO ₂	Sulfur Dioxide
SPM	Special Purpose Monitor
STN PM _{2.5}	Speciation Trends Network
TPY	Tons per Year
TSP	Total Suspended Particulate

TEOM	Tapered Element Oscillating Microbalance
ug/m ³	micrograms per cubic meter
U.S.EPA	United States Environmental Protection Agency
UV	Ultraviolet
VOC	Volatile Organic Compounds
VSCC	Very Sharp Cut Cyclone

Introduction

In October 2006, U.S.EPA issued final regulations concerning state and local agency ambient air monitoring networks. These regulations require states to submit an annual monitoring network review to U.S.EPA. This network plan is required to provide the framework for establishment and maintenance of an air quality surveillance system and to list any changes that are proposed to take place to the current network during the 2012 season.

Public Review and Comment

The annual monitoring network plan must be made available for public inspection for thirty (30) days prior to submission to U.S.EPA. Information on how to comment to the plan and any comments received are listed in Appendix A.

Indiana's Air Monitoring Network

IDEM regulates air quality to protect public health and the environment in the State of Indiana. Air monitoring data are required by regulation and are used to determine compliance with U.S.EPA's NAAQS. Other important uses of the air monitoring data includes, the production of a daily AQI report, daily air quality forecast report, support of short and long-term health risk assessments, identification of a localized health concern, and tracking long-term trends in air quality. Indiana monitors the six (6) criteria pollutants which have NAAQS identified for them; CO, lead, NO₂, O₃, particulate matter (PM₁₀ and PM_{2.5}), and SO₂. Other pollutants which do not have an ambient standard established for them are also monitored; toxics (VOCs), metals, carbonyls, PM_{2.5} speciated compounds, and ozone precursors. In addition meteorological data are also collected to support the monitoring and aid in analysis of the data.

Air Quality Data

IDEM presents two different types of air quality data, intermittent and continuous on IDEM's Internet website <http://www.in.gov/idem/4652.htm>. Annual and quarterly summary reports of pollutants collected by manual methods are available as well as hourly values from continuous monitors. The Leading Environmental Analysis and Display System (LEADS) provides on-line access to Indiana's continuous air quality monitoring network. It has been available to the public since July, 2007. LEADS offers access to near real-time data from sixty (60) continuous air monitoring sites across Indiana. This allows anyone to track pollutant and meteorological values throughout the day. In addition, past data back to 1998 are available as raw data and canned summary reports or user specified retrievals.

Overview of Monitored Parameters

Criteria Pollutants

Carbon Monoxide (CO)

CO is a poisonous gas that, when introduced into the bloodstream, inhibits the delivery of oxygen to body tissue. The health risk is greatest for individuals with cardiovascular disease.

Lead (Pb)

Lead is a metal that is highly toxic when ingested or inhaled. It is a suspected carcinogen of the lungs and kidneys and has adverse effects on cardiovascular, nervous, and renal systems.

Nitrogen Dioxide (NO₂)

NO₂ is a highly toxic, reddish brown gas that is created primarily from fuel combustion in industrial sources and vehicles. It creates an odorous haze that causes eye and sinus irritation, blocks natural sunlight, and reduces visibility.

Ozone (O₃)

Ground-level O₃, or photochemical smog, is not emitted into the atmosphere as ozone, but rather is formed by the reactions of other pollutants. The primary pollutants entering into this reaction, VOCs and oxides of nitrogen, create ozone in the presence of sunlight. Ozone is a strong irritant of the upper respiratory system and also causes damage to crops.

Particulate Matter (PM₁₀)

Particulate matter with a mean diameter of 10 microns or less is emitted from transportation and industrial sources. Exposure to particle pollution is linked to a variety of significant health problems ranging from aggravated asthma to premature death in people with heart and lung disease.

Fine Particulate Matter (PM_{2.5})

Fine particulate matter with a diameter of 2.5 microns or less is created primarily from industrial processes and fuel combustion. These particles are breathed deeply into the lungs. Exposure to particle pollution is linked to a variety of significant health problems ranging from aggravated asthma to premature death in people with heart and lung disease.

Sulfur Dioxide (SO₂)

SO₂ is a gaseous pollutant that is emitted primarily by industrial furnaces or power plants burning coal or oil containing sulfur. At high concentrations, breathing can be impaired. Damage to vegetation can also result.

Non Criteria Parameters

PM_{2.5} Speciation

U.S.EPA implemented the PM_{2.5} chemical speciation monitoring program. Knowing the chemical composition of the PM_{2.5} mix is important for determining sources of pollution and links between observed health effects. The basic objective of speciation analysis is to develop seasonal and annual chemical characterizations of ambient particulates across the nation. This speciation data will be used to perform source attribution analyses, evaluate emission inventories and air quality models, and support health related research studies and regional haze assessments.

The speciation samplers use different inlet tubes and filters to collect the components of the PM_{2.5} mixture. The process consists of using three different types of filters to separate out such specific

compounds as: sulfate, nitrate, organic and elemental carbon, ammonium, metals, and certain ions.

Photochemical Assessment Monitoring Station, PAMS (Ozone Precursors)

Of the six (6) criteria pollutants, O_3 is the most encompassing. The most prevalent photochemical oxidant and an important contributor to "smog," O_3 is unique among the criteria pollutants because it is not emitted directly into the air. Instead, it results from complex chemical reactions in the atmosphere between VOCs and NO_x in the presence of sunlight. There are thousands of sources of VOCs and NO_x located across the country. To track and control ozone, U.S.EPA is trying to create an understanding of not only the pollutant itself, but the chemicals, reactions, and conditions that contribute to its formation as well. Because of this, U.S.EPA called for improved monitoring of ozone and its precursors, VOC and NO_x , to obtain more comprehensive and representative data on ozone air pollution. U.S.EPA initiated the PAMS program in February 1993. The PAMS program requires the establishment of an enhanced monitoring network in all ozone nonattainment areas classified as serious, severe, or extreme.

Toxics / Carbonyls / Metals

Toxic air pollutants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer, other serious health effects, or adverse environmental conditions. Air toxics include: semi-volatile and volatile organic compounds (VOC), metals, and carbonyls.

Air toxic compounds are released from many different sources, including mobile sources (vehicles), stationary industrial sources, small area sources, indoor sources (cleaning materials, etc.), and other environmental sources (wildfires, etc.). The lifetime, transportation, and make-up of these pollutants are affected by weather and landscape. They can be transported far away from the original source, or be caught in rain and brought down to waterways or land.

The air toxics, carbonyls, and metals are divided into separate categories due to different sampling and analytical methodologies used for each. With all three categories combined, more than eighty different pollutants are analyzed.

Meteorological Monitoring

Any study of air pollution should include an analysis of the weather patterns (meteorology) of the local area because the fate of air pollutants is influenced by the movement and characteristics of the air mass into which they are emitted.

If the air is calm and pollutants cannot disperse, then the concentration of these pollutants will build up. Conversely, if a strong and turbulent wind is blowing, the pollutant will rapidly disperse into the atmosphere and will result in lower concentrations near the pollution source.

The measurements of wind speed and direction, temperature, humidity, rainfall, barometric pressure, ultraviolet radiation and solar radiation are important parameters used in the study of air quality monitoring results, and to further understand the chemical reactions that occur in the atmosphere. Meteorological monitoring is used to predict air pollution events, high pollutant concentration days and to simulate and predict air quality using computer models.

NCore Monitoring

NCore is a multi-pollutant approach to monitoring. NCore sites are intended to support multiple objectives with a greater emphasis on assessment, research support and accountability than the traditional NAMS/SLAMS networks. NCore provides an opportunity to address new directions in monitoring and begin to fill measurement and technological gaps that have accumulated in the networks. Indiana is required to establish and operate one (1) urban NCore site. These sites are required to measure $PM_{2.5}$, speciated $PM_{2.5}$, $PM_{10-2.5}$, O_3 , SO_2 , CO, NO, NO_2 , NO_y , Pb, and meteorology.

National Ambient Air Quality Standards (NAAQS)

NAAQS are identified for the criteria pollutants; CO, Pb, NO₂, O₃, particulate matter (PM₁₀ and PM_{2.5}), and SO₂. Measuring pollutant concentrations in outdoor air and comparing the measured concentrations to corresponding standards determine ambient air quality status of an area, attainment or nonattainment.

The NAAQS are broken down into primary and secondary standards. Primary standards are those established to protect public health. Secondary standards are those established to protect the public welfare from adverse pollution effects on soils, water, vegetation, manmade materials, animals, weather, visibility, climate, property, and economy.

The scientific criteria upon which the standards are based are reviewed periodically by U.S.EPA, which may reestablish or change the standards according to its findings. Note that there are hundreds of compounds that are generally considered pollutants when found in ambient air but whose health and welfare effects are not well enough understood for ambient standards to be defined.

A pollutant measurement that is greater than the ambient air quality standard for its specific averaging time is called an exceedance. This is not necessarily a synonym for a violation; for each pollutant there are specific rules about how many exceedances are allowed in a given time period before a pattern of exceedances is considered a violation of the NAAQS that may result in regulatory actions to further clean up the area's air. This distinction is made to allow for certain limited exceedances of the standard that may occur, for example, during an unusual weather pattern, reserving regulatory action for cases where the exceedances are too large or too frequent.

The design value for a site is the level of pollutant concentration when the rules of the NAAQS calculations are applied to that specific pollutant. For example, the O₃ design value is calculated by taking the three (3) year average of the annual fourth highest daily 8-hour maximums. If this number is above the NAAQS for O₃, then it is an exceedance or 'nonattainment' of the NAAQS. If the design value is below the NAAQS then the area is in 'attainment' of the standard. Generally, nonattainment is based on the highest design value reported for a specific geographic area (usually an MSA), and the entire area would be defined by that monitor, and would be classified accordingly. This number basically tells you how polluted an area would be in relation to a NAAQS. A listing of the NAAQS can be found at: <http://epa.gov/air/criteria.html>

5-Year Network Assessment

U.S.EPA requires a Network Assessment be performed every five (5) years, as per 40CFR Part 58.10(d). The first Network Assessment has been approved by U.S.EPA. The Lake Michigan Air Directors Consortium, LADCO published "Regional Network Assessment" for the states of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin, July 1, 2010. The report is available at http://www.ladco.org/reports/general/Regional_Network_Assessment/index.php

Recommendations affecting Indiana's network are the relocation of the PM_{2.5} Speciation sampler at Hammond-Purdue (180892004) to Green Bay, Wisconsin, and the addition of PM_{2.5} and meteorological instruments at Plummer (180550001).

New U.S.EPA Monitoring Requirements

Several of the NAAQS and the monitoring requirements for the various pollutants have either been revised recently, are in the final review stages prior to promulgation, or are planning to have proposals within the next year. Even though IDEM is aware of these proposals and how they could possibly affect Indiana's monitoring network, only those requirements which have been approved and are in effect at this time are considered when modifying Indiana's current network.

Network Overview

Indiana has reviewed its current ambient air quality network and developed a proposed network to be implemented during 2012. Current NAAQS, data trends, site redundancy, siting problems, site access concerns, and other identified monitoring issues all contribute to any proposed network revisions.

The number of sites listed in the current monitoring network includes changes planned to have occurred during 2010 and were not, but are planned to be completed during 2011. These include the establishment of the Hamilton County site for PM_{2.5}, the southwest Marion County meteorological site, and the relocation of the Granger O₃ site.

One (1) unplanned site discontinuation occurred in 2011 due to the Evansville-Post Office building closing. PM_{2.5} and lead were discontinued. The QA collocated PM_{2.5} was moved to Evansville-Buena Vista.

Indiana's air monitoring network for 2012 consists of the sites and monitors listed in Table 1. All site changes which have occurred or plan to take place in 2011 are included along with the planned network modifications for 2012. Figure 1 is an overview of Indiana's current monitoring network and shows the locations where some form of monitoring takes place in 2012.

Overall, the number of monitoring locations operated by the State is planned to decrease from eighty-four (84) sites to eighty-two (82) sites. The number of monitored parameters or monitoring systems will remain at one hundred eighty-nine (189).

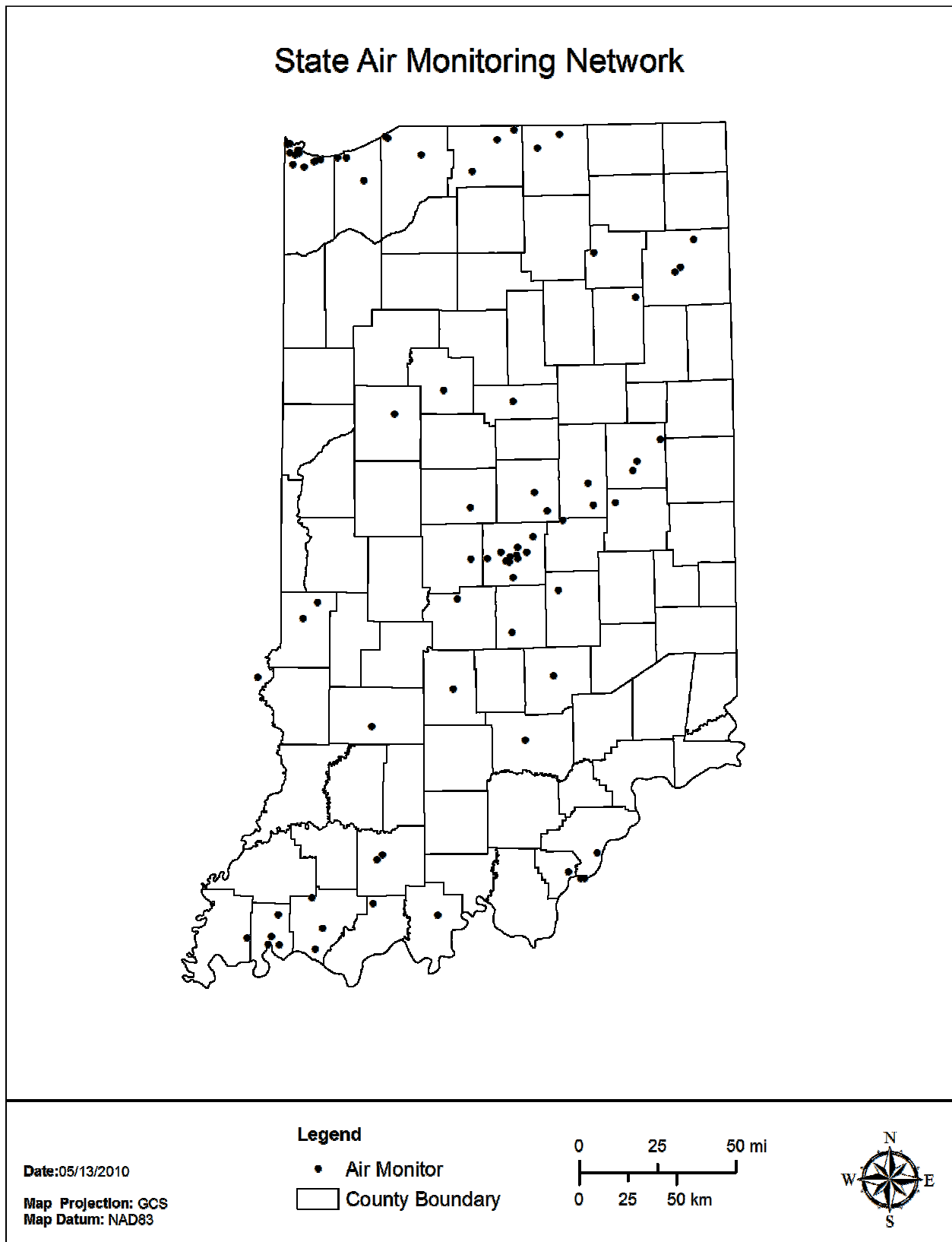
Table 1 – State Air Monitoring Network

Indiana Ambient Air Quality Monitoring Network 2011																					
AQS#	COUNTY	CITY	SITE NAME	SITE ADDRESS	O ₃	SO ₂	CO	NO _x	PM ₁₀	PM _{10-2.5}	PM _{2.5} (FRM)	PM _{2.5} (Cont)	PM _{2.5} (Spec)	PM _{2.5} (Spec Cont)	LEAD	TOXICS (VOCs)	O ₃ PREC	CAR-BONYLS	METALS	MET	
170230001	Clark, IL	West Union, IL	West Union	416 S. Hwy 1	X															X	
180030002	Allen	Leo	Leo	Leo HS, 14600 Amstutz Rd.	X																
180030004	Allen	Fort Wayne	Fort Wayne - Beacon St.	2022 N. Beacon St	X						X	X								X	
180030011	Allen	Fort Wayne	Fort Wayne - Career Cntr.	Career Center, 203 E. Douglas St.			X														
18005___	Bartholomew		Columbus								Add	Add									
180110001	Boone		Whitestown	Perry-Worth Elem Sch., 3900 E. 300 S, Lebanon	X																
180150002	Carroll		Flora	Flora Airport, 481 S. 150 W, Flora	X															X	
180190006	Clark	Jeffersonville	Jeffersonville - Walnut St	PFAU, 719 Walnut St.					X		X		X								
180190008	Clark		Charlestown St. Park	Charlestown State Park, 12500 Highway 62, Charlestown	X						X									X	
180190009	Clark	Clarksville	Clarksville	Falls of the Ohio State Park, 201 W. Riverside Dr.												X					
180350006	Delaware	Muncie	Muncie - Central HS	801 N. Walnut St.							X										
180350009	Delaware	Muncie	Muncie - Mt. Pleasant Blvd.	2601 W. Mt. Pleasant Blvd.											X						
180350010	Delaware	Albany	Albany	Albany Elem. Sch., 700 W. State St.	X																
180370004	Dubois	Jasper	Jasper - Sport	1401 12th Ave.																X	
180372001	Dubois	Jasper	Jasper - Post Office	Post Office, 206 E. 6th St.					X		X		X								
180390007	Elkhart	Bristol	Bristol	Bristol Elem. Sch. 705 Indiana Ave.	X																
180390008	Elkhart	Elkhart	Elkhart - Prairie St.	2745 Prairie St.							X	X	X	Add B.Carbon							
180431004	Floyd	New Albany	New Albany	Green Valley Elem. Sch., 2230 Green Valley Rd.	X	X					X	X									
180510012	Gibson		Oakland City	2205 S. 1350 E, Oakland City							Discontinue									Relocate	
180550001	Greene		Plummer	2500 S. 275 W	X						Relocation	Add								Relocation	
180570006	Hamilton	Noblesville	Noblesville - 191st St.	Our Lady of Grace Catholic Church, 9900 E. 191st St.	X																
18057___	Hamilton	Fishers									Add	Add									
180590003	Hancock	Fortville	Fortville	Fortville Municipal Bldg.	X																
180630004	Hendricks	Avon	Avon	7203 E. US Highway 36	X																
180650003	Henry		Mechanicsburg	Shenandoah HS, 7354 W. Hwy. 36, Middletown							X		X							X	
180670003	Howard	Kokomo	Kokomo	Fire Station, 215 W. Superior St.							X										
180690002	Huntington	Roanoke	Roanoke	Roanoke Elem. Sch., 423 W. Vine St.	X																
180710001	Jackson		Brownstown	225 W & 300 N, Brownstown	X															X	
180810002	Johnson	Trafalgar	Trafalgar	200 W. Pearl St.	X																
180830004	Knox		Southwest Ag Center	Southwest Purdue Ag. Center, Vincennes							Relocate										
180890006	Lake	East Chicago	East Chicago - Franklin Sch.	Franklin Elem. Sch, Alder & 142nd St.					X		X										

AQS#	COUNTY	CITY	SITE NAME	SITE ADDRESS	O ₃	SO ₂	CO	NO _x	PM ₁₀	PM _{10-2.5}	PM _{2.5} (FRM)	PM _{2.5} (Cont)	PM _{2.5} (Spec)	PM _{2.5} (Spec Cont)	LEAD	TOXICS (VOCs)	O ₃ PREC	CARBONYLS	METALS	MET
180890015	Lake	East Chicago	East Chicago - Post Office.	East Chicago Post Office, 901 E. Chicago Ave.			X													
180890022	Lake	Gary	Gary - IITRI	IITRI Bunker, 201 Mississippi St.	X	X		X	X		X	X	X	B. Carbon		X	X	X		X
180890023	Lake	East Chicago	East Chicago - Aldis St.	East Chicago Water Treatment Plant, 3330 Aldis St.					Relocate						Relocate	Relocate			Relocate	
18089	Lake	East Chicago	East Chicago						Relocation						Relocation	Relocation			Relocation	
180890026	Lake	Gary	Gary - Burr St.	25th Ave. and Burr St.							X									
180890027	Lake	Griffith	Griffith	Ready Elementary School, 1345 N. Broad St.							Discontinue									
180890028	Lake	Whiting	Whiting - HS	Whiting High School, 1751 Oliver St.	X											X				
180890031	Lake	Gary	Gary - Madison St.	Indiana American Water Co. 650 Madison St.					X		X									
180890032	Lake	Gary	Gary - 4th Ave.	Gary SouthShore RailCats, One Stadium Plaza											X				X	
180890033	Lake	Gary	East Chicago - E. 135th St.	Abraham Lincoln Elem. Sch., E. 135th St.											X				X	
180892004	Lake	Hammond	Hammond - Purdue	Powers Bldg. Purdue Univ. Calumet, 2200 169th St.							X	X	Discontinue							
180892008	Lake	Hammond	Hammond - 141st St.	1300 E. 141st St.	X	X									X	X			X	X
180892010	Lake	Hammond	Hammond - Clark HS	Clark High School, 1921 Davis St.					X		X									
180910005	LaPorte	Michigan City	Michigan City - 4th St.	NIPSCO Gas Station, 341 W. 4th St.	X															
180910010	LaPorte	LaPorte	LaPorte - E. Lincolnway	2011 E. Lincolnway	X															
180910011	LaPorte	Michigan City	Michigan City - Marsh Elem. Sch.	400 E. Homer St.							X									
180950011	Madison	Anderson	Anderson - Eastside Elem.	Eastside Elem. Sch., 844 N. Scatterfield Rd.							X	X								
180950010	Madison		Emporia	East Elem. Sch., 893 E. US 36, Pendleton	X															
180970043	Marion	Indianapolis	Indpls - West St.	1735 S. West St.					X		X									
180970050	Marion	Indianapolis	Indpls - Ft. Harrison	Ft. Harrison St. Park, 5753 Glenn Rd.	X															
180970057	Marion	Indianapolis	Indpls - Harding St.	1321 S. Harding St.	X	X														X
180970063	Marion	Indianapolis	Indpls - Rockville Rd.	7601 Rockville Rd											X					
180970071	Marion	Indianapolis	Indpls - Drover St.	National Printing Plate, 1415 Drover St.					X											
180970072	Marion	Indianapolis	Indpls - N. Illinois St	50 N. Illinois St.			X													
180970073	Marion	Indianapolis	Indpls - E. 16th St	6125 E. 16th St.	X	X	X	X	Discontinue											X
180970076	Marion	Indianapolis	Indpls - Quemetco	230 S. Girls School Rd.											Discontinue					
180970078	Marion	Indianapolis	Indpls - Washington Park	Washington Park, 3120 E. 30th St.	X	X	X	X	X	IntX AddCont1	X	X	X	B. Carbon Sulfate	X	X	Add	X	X	X
180970081	Marion	Indianapolis	Indpls - W. 18th St	School 90, 3351 W. 18th St.							X	X								
180970083	Marion	Indianapolis	Indpls - E. Michigan St	School 15, 2302 E. Michigan St.							X									
180970084	Marion	Indianapolis	Indpls - School 21	School 21, 2815 English Ave.					X		X									
18097	Marion	Indianapolis	Indpls - Southport	Southport Advanced Wastewater Treatment Plant, 3800 W. Southport Rd																Add
18097	Marion	Indianapolis	Roadside					Add												
181050003	Monroe	Bloomington	Bloomington - Binford	Binford Elem. Sch., 2300 E. 2nd St.							X	X								
181090005	Morgan	Monrovia	Monrovia	Monrovia HS, 135 S Chestnut St	X															

AQS#	COUNTY	CITY	SITE NAME	SITE ADDRESS	O ₃	SO ₂	CO	NO _x	PM ₁₀	PM _{10-2.5}	PM _{2.5} (FRM)	PM _{2.5} (Cont)	PM _{2.5} (Spec)	PM _{2.5} (Spec Cont)	LEAD	TOXICS (VOCs)	O ₃ PREC	CAR-BONYLS	METALS	MET	
181230009	Perry		Leopold	Perry Central HS, 19856 Old St. Rd 37, Leopold	X																
181270023	Porter	Portage	Portage - Hwy 12	Bethlehem Steel Waste Lagoon, Hwy. 12					X						Relocate				Relocate		
181270027	Porter		Burns Harbor - Port of Indiana												Relocation				Relocation		
181270024	Porter	Ogden Dunes	Ogden Dunes	Water Treatment Plant, 84 Diana Rd.	X				X		X	X				X					
181270026	Porter	Valparaiso	Valparaiso	Valparaiso Water Dept., 1000 Wesly St.	X																
181290003	Posey		St. Philips	2027 St. Phillips Rd., Evansville	X															X	
181410010	St. Joseph		Potato Creek St. Park	Potato Creek St. Park, 25601 St. Rd. 4, N. Liberty	X																
181410015	St. Joseph	South Bend	S. Bend - Shields Dr.	2335 Shields Dr.	X			X			X	X								X	
181411007	St. Joseph	Granger	Granger	Harris Twnshp Fire Sta, 12481 Anderson Rd.	Relocate																
18141____	St. Joseph			Granger Area	Relocation																
181450001	Shelby		Fairland	Triton Central MS, 4740 W. 600N, Fairland	X																
181470009	Spencer	Dale	Dale	David Turnham School, Dunn & Locust							X										
181570008	Tiptecanoe	Lafayette	Lafayette - Greenbush St.	Cinergy Substation, 3401 Greenbush St.							X	X				X					
181630013	Vanderburgh		Inglefield	Scott Elem. School, 14940 Old State Rd.	X																
181630016	Vanderburgh	Evansville	Evansville - U. of E.	University of Evansville - Carson Center							X					X					
181630020	Vanderburgh	Evansville	Evansville - Post Office	800 Sycamore St.							Discontinue				Discontinue						
181630021	Vanderburgh	Evansville	Evansville - Buena Vista	1110 W. Buena Vista Rd.	X	X		X	X		X	X	X	B. Carbon Sulfate							
181630022	Vanderburgh	Evansville	Evansville - Lloyd	10 S. 11th Ave.			X														
181670018	Vigo	Terre Haute	Terre Haute - Lafayette Ave.	961 N. Lafayette Ave.	X	X			X		X	X									
181670024	Vigo		Sandcut	7597 Stevenson Rd., Terre Haute	X																
181730008	Warrick	Boonville	Boonville	Boonville HS, 300 N. 1st St.	X																
181730009	Warrick		Lynnville	Tecumseh HS, 5244 State Road 68, Lynnville	X																
181730011	Warrick		Dayville	3488 Eble Rd., Newburgh	X															X	
181830003	Whitley	Larwill	Larwill	Whitko Middle School, 710 N. State Rd. 5							X	X								X	
Number of Parameters																					
		Number of Monitoring Sites		Number of Monitored Parameters		O ₃	SO ₂	CO	NO _x	PM ₁₀	PM _{10-2.5}	PM _{2.5} (FRM)	PM _{2.5} (Cont)	PM _{2.5} (Spec)	PM _{2.5} (Spec Cont)	LEAD	TOXICS (VOCs)	O ₃ PREC	CAR-BONYLS	METALS	MET
Current Monitoring Network (2011)		84		189		42	8	6	5	16	2	35	16	8	5	9	9	2	2	6	18
Proposed Monitoring Network (2012)		82		189		42	8	6	6	15	2	34	18	7	6	8	9	2	2	6	18
Indicates a site where a change is to occur or occurred in 2011																					
Indicates a site where a change is planned for 2012																					

Figure 1 – State Air Monitoring Network 2012



Review Summary

Unanticipated changes made to the 2011 Monitoring Network are:

- Discontinuations of the Evansville-Post Office PM_{2.5} monitor and lead monitor.
- The addition of a collocated PM_{2.5} monitor at Evansville-Buena Vista.
- Addition of PAMS at Indpls-Washington Park.

The changes proposed for the 2012 Monitoring Network are:

- Relocation of the Granger O₃ site.
- Relocation of East Chicago-Aldis St. PM₁₀, lead, toxics (VOCs), and metals monitors.
- Discontinuation of Southwest Ag Center with relocation of PM_{2.5} monitor to Plummer, and addition of continuous PM_{2.5}.
- Discontinuation of Indpls-E. 16th St. PM₁₀.
- Discontinuation of Indpls-Quemetco lead monitor.
- Discontinuation of Oakland City PM_{2.5} and relocation of metrological instruments to Plummer.
- Discontinuation of Griffith PM_{2.5}.
- Discontinuation of Hammond-Purdue PM_{2.5} speciation.
- Addition of Columbus site for PM_{2.5} FRM and continuous.

Network Description

As per 40 CFR Part 58.10, an annual monitoring network plan which provides for the establishment and maintenance of an air quality surveillance system consisting of the air quality monitors in the state, is required to be submitted by all states to U.S.EPA.

Specifically §58.10 (a) requires for each existing and proposed monitoring site:

1. A statement of purpose for each monitor.
2. Evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of 40 CFR Part 58, where applicable.
3. Proposals for any State and Local Air Monitoring station (SLAMS) network modifications.

§58.10 (b) requires the plan must contain the following information for each existing and proposed site:

1. The Air Quality System (AQS) site identification number.
2. The location, including street address and geographical coordinates.
3. The sampling and analysis method(s) for each measured parameter.
4. The operating schedules for each monitor.
5. Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal.
6. The monitoring objective and spatial scale of representativeness for each monitor.
7. The identification of any sites that are suitable and sites that are not suitable for comparison against the annual PM_{2.5} NAAQS as described in §58.30.
8. The Metropolitan Statistical Area (MSA), Core Based Statistical Area (CBSA), Combined Statistical Area (CSA) or other area represented by the monitor.
9. The designation of any Pb monitors as either source-oriented or non-source-oriented according to Appendix D to 40 CFR part 58.
10. Any source-oriented monitors for which a waiver has been requested or granted by the U.S.EPA Regional Administrator as allowed for under paragraph 4.5(a)(ii) of Appendix D to 40 CFR part 58.
11. Any source-oriented or non-source-oriented site for which a waiver has been requested or granted by the U.S.EPA Regional Administrator for the use of Pb-PM₁₀ monitoring in lieu of Pb-TSP monitoring as allowed for under paragraph 2.10 of Appendix C to 40 CFR part 58.

Network Review Description

The following definitions represent some of the categories found in the Network Review:

Monitor Type – The name of the designated network:

- ° PAMS – *Photochemical Assessment Monitoring Station*: Sites established to obtain more comprehensive data of areas with high levels of ozone pollution by also monitoring NO_x and VOCs.
- ° SLAMS – *State or Local Ambient Monitoring Station*: The SLAMS make up the ambient air quality monitoring sites that are primarily needed for NAAQS comparisons. U.S.EPA must approve all SLAMS sites.
- ° STN – *PM_{2.5} Speciation Trends Network*: A PM_{2.5} speciation station designated to be part of the speciation trends network. This network provides chemical species data of fine particulates.
- ° Supplemental Speciation – Any PM_{2.5} speciation station that is used to gain supplemental data and is not dedicated as part of the speciation trends network.
- ° SPM – *Special Purpose Monitor*: Any monitor included in the agency's network that does not count when showing compliance with the minimum requirements of this subpart and for siting monitors of various types.
- ° NCore – *National Core multi-pollutant monitoring station*: Sites that measure multiple pollutants at trace levels in order to provide support to integrated air quality management data needs. There is currently one NCore site for Indiana located in Indianapolis.
- ° QA Collocated – An audit monitor that is located adjacent to another monitor of the same type used to report air quality for the site. The audit monitor is used solely for Quality Assurance purposes.

Operating Schedule - specifies how often a sample is taken.

- ° Continuous - operates 24/7; applies mainly to gaseous analyzers, although some particulate samplers (TEOM/FDMS, SHARP, and BAMs) operate continuously.
- ° Daily – a sample is taken every day; applies to manual method particulate samplers.
- ° 3 - Day - Manual method particulate samplers that run every third day.
- ° 6 - Day - Manual method particulate samplers that run every sixth day.

Sampling Method – Each ambient air monitor is classified by a specific method number. This method combines both the collection procedure along with the analysis performed on the sample. These numbers can be found in the U.S.EPA “List of Designated Reference and Equivalent Methods” (see U.S.EPA Transfer Technology Network web page at:

<http://www.epa.gov/ttn/amtic/files/ambient/criteria/reference-equivalent-methods-list.pdf>

Scale – The specific “spatial scales of representation” describes the physical dimensions of the air parcel around the monitoring station throughout which actual pollutant concentrations are reasonably similar.

- ° Microscale - Areas ranging from several meters to about 100 meters,
- ° Middle scale - Areas ranging from 100 meters to 0.5 kilometers,
- ° Neighborhood - 0.5 to 4.0 kilometers, and uniform land use,
- ° Urban scale - 4 to 50 kilometers, and
- ° Regional - 50 to hundreds of kilometers.

Monitoring Objective – Describes the purpose/objective for monitoring at a site.

- ° General/Background concentration – sites located to determine general background concentration levels
- ° Highest concentration – sites located to determine the highest concentrations expected to occur in the area covered by the network
- ° Population exposure – sites located to measure typical concentrations in areas of high population density
- ° Quality assurance – sites where two monitors of the same type are located; one used to report air quality for the site, the other dedicated as an audit monitor
- ° Regional transport – sites located to determine the extent of regional pollutant transport among populated areas; and in support of secondary standards

- ° Source-oriented – sites located to determine the impact of significant sources or source categories on air quality
- ° Upwind background – sites established to characterize upwind background and transported ozone and its precursor concentrations into an area

NAAQS Comparable – 40 CFR Part 58 Appendix B requires the identification of any sites that are suitable or not suitable for comparison against the Annual $PM_{2.5}$ NAAQS as described in Section §58.30. If a 'No' is present in this category this site is located close to a localized hot spot and can only be compared to the 24-hour $PM_{2.5}$ NAAQS, not the Annual $PM_{2.5}$ NAAQS.

MSA – MSAs are defined by the U.S Office of Management and Budget as geographical areas having a large population nucleus and a high degree of economic and social integration with the nucleus. In Indiana, MSAs are either one county or a group of counties. Figure 2 is a map of the MSAs in Indiana. Several border areas are included with other counties in bordering states.

Site Change Proposed – Designates whether this particular site is being considered for some type of modification during 2012; relocation, discontinuation, or addition.

Monitoring Requirements

Appendix A of 40 CFR Part 58 outlines the Quality Assurance Requirements for SLAMS, SPMs, and PSD Air Monitoring. It details the calibration and auditing procedures used to collect valid air quality data, the minimum number of collocated monitoring sites, the calculation used for data quality assessments, and the reporting requirements. All sites in Indiana operate following the requirements set forth in this appendix.

Appendix C of 40 CFR Part 58 specifies the criteria pollutant monitoring methods which must be used in SLAMS and NCore stations. All criteria pollutant monitoring in Indiana follows the methods specified in this appendix.

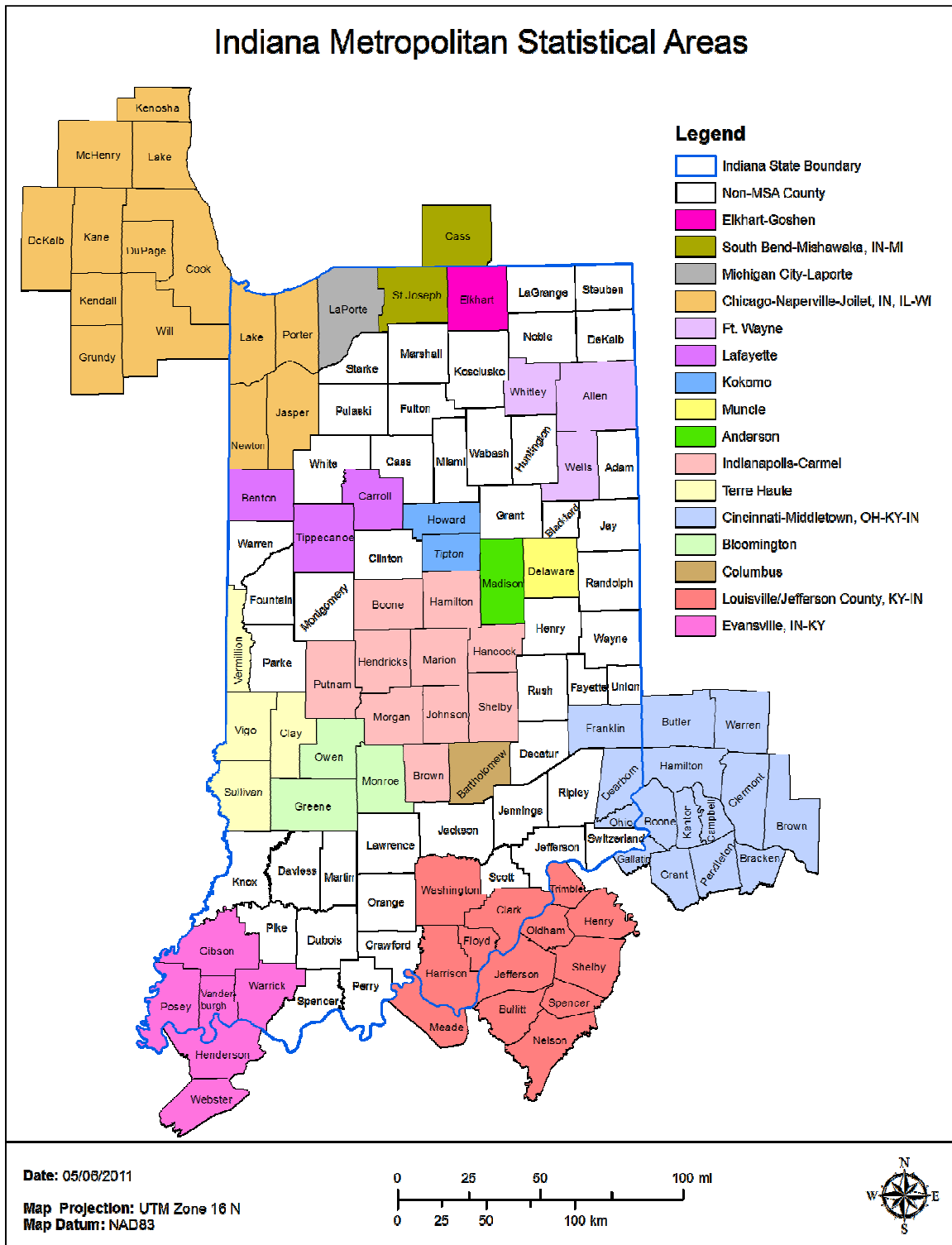
Appendix D of 40 CFR Part 58 deals with the network design criteria for ambient air quality monitoring. The overall design criteria, the minimum number of sites for each parameter, the type of sites, the spatial scale of the sites, and the monitoring objectives of the sites are detailed. In designing the air monitoring network for Indiana, the requirements of this appendix were followed. The specifics for each pollutant network are in the individual parameter chapters.

O_3 , PM_{10} , and $PM_{2.5}$ have minimum monitoring requirements based upon the population of an MSA. Population data from the 2010 census is used in this report.

According to 2.(e) of this appendix, "The EPA recognizes that State and 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." The individual tables list the data, the requirements, and the current sites for the full multi agency MSAs. In the instances where it is more logical or desirable to divide the monitoring requirements, Indiana has entered into agreements with some of the neighboring agencies to ensure that the minimum requirements for the MSA continue to be met and the resulting network provides adequate coverage. Agreements have been signed with the Hamilton County (OH) Department of Environmental Services and the Louisville Metropolitan Air Pollution Control District.

The placement of a monitoring probe, its spacing from obstructions, and probe materials are outlined in Appendix E of 40 CFR Part 58, which deals with the placement of the monitoring probe, it's spacing from obstructions and what materials the probe can be made of. All monitors operated in Indiana meet Appendix E criteria.

Figure 2 – Indiana MSAs



Parameter Networks

Carbon Monoxide (CO)

Monitoring Requirements

40 CFR Part 58 Appendix D, 4.2 details the requirements for CO monitoring. There are no minimum requirements for the number of CO monitoring sites. Continued operation of the existing SLAMS CO sites using FRM or FEM is required until discontinuation is approved by U.S.EPA. Where SLAMS CO monitoring is ongoing, at least one site must be a “maximum concentration” site for that particular area under investigation. Microscale and middle scale measurements are useful classifications for SLAMS CO sites since most people have the potential for exposure on these scales. Maximum CO concentrations primarily occur in areas near major roadways and intersections with high traffic density and often poor atmospheric ventilation.

Middle scale CO monitoring is intended to represent areas with dimensions from 100 meters to 0.5 kilometers. In some cases middle scale measurements may apply to areas that have a total length of several kilometers such as “Line Emission Sources.” This type of emission source area would include air quality along a commercially developed street, shopping plaza, freeway corridor, parking lots and feeder streets.

Microscale CO monitoring applies when air quality measurements are to be used to represent distributions within street canyons, over sidewalks, and near major roadways. Microscale measurements in one location can often be considered as representative of similar locations throughout a city.

40 CFR Part 58 Appendix D, 3(b) states that CO measurements will be included at the NCore multi-pollutant monitoring sites. CO is monitored at Indpls-Washington Park NCore site.

Monitoring Methodology

Indiana’s CO monitoring network collects data with the Thermo Environmental Model 48c and Model 48i analyzers using nondispersive infrared monitoring methodology. The API Model 300EU Trace level/Ultra-sensitive analyzer is used to collect trace level CO data at the NCore Indpls - Washington Park site.

Monitoring Network

Indiana operates six (6) CO monitors located throughout the state, as displayed in Figure 3. The details of the current network, along with any changes planned in 2012, are listed in Table 2.

Network Modifications

There are no changes planned for the CO monitoring network in 2012.

Figure 3 – CO Monitoring Network

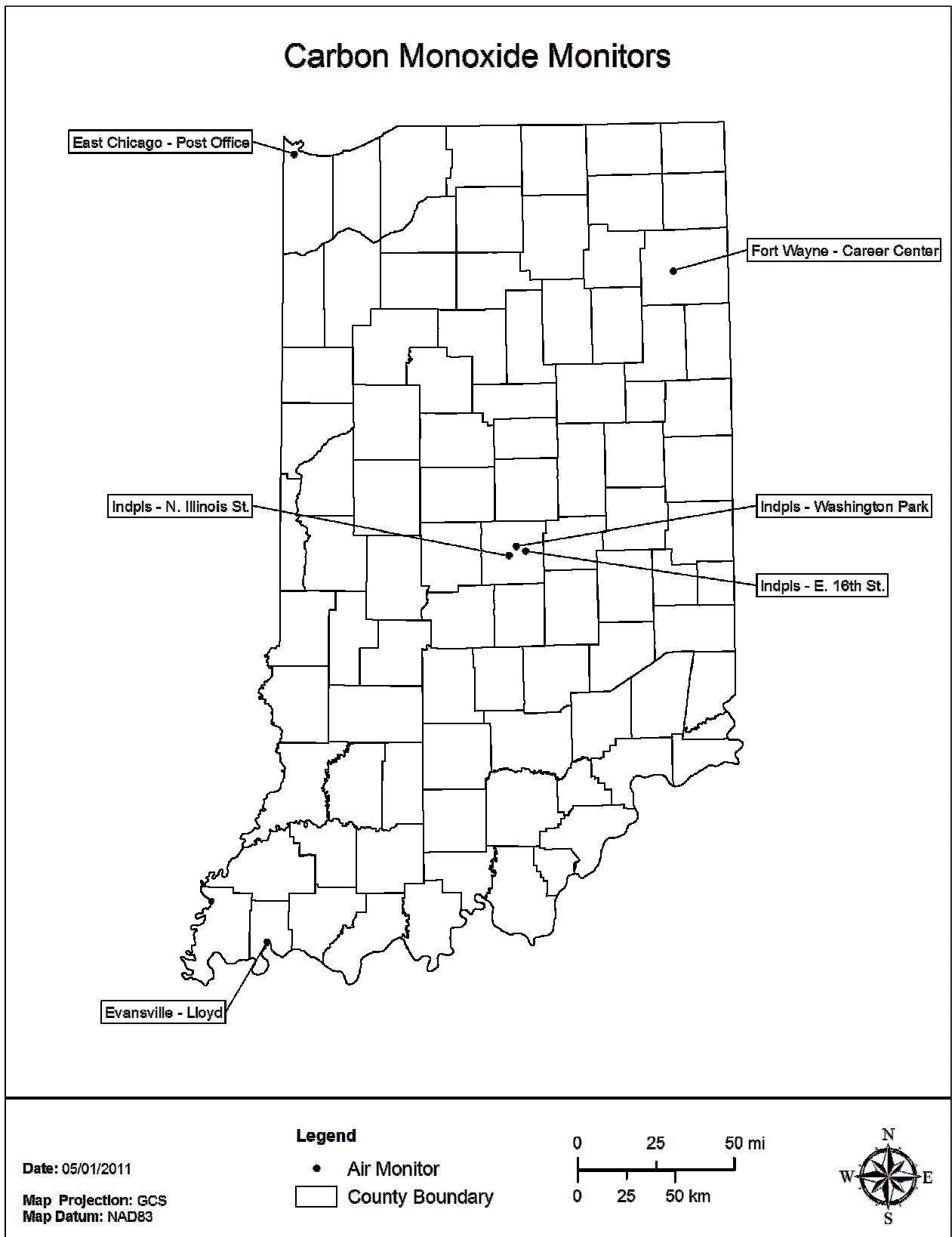


Table 2 – CO Monitoring Network

Parameter Code: 42101		CO - Carbon Monoxide												
RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management														
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
180030011	Fort Wayne Career Cntr.	Allen	Fort Wayne	Career Center, 203 E. Douglas St.	SLAMS	03/01/94	Continuous	054	Micro	Highest Conc	41.074167	-85.136667	Ft. Wayne	No
180890015	East Chicago - Post Office	Lake	East Chicago	Post Office, 901 East Chicago Ave.	SLAMS	03/01/84	Continuous	054	Micro	Highest Conc	41.628611	-87.461389	Chicago-Naperville-Joliet, IL	No
180970072	Indpls - Illinois St.	Marion	Indianapolis	50 N. Illinois St.	SLAMS	02/01/90	Continuous	054	Micro	Highest Conc	39.768056	-86.160000	Indianapolis-Carmel	No
180970073	Indpls - E. 16th St.	Marion	Indianapolis	6125 E. 16th St.	SLAMS	04/02/90	Continuous	054	Neigh	Pop Exp	39.789167	-86.060833	Indianapolis-Carmel	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	NCORE	01/01/10	Continuous	093	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No
181630022	Evansville - Lloyd	Vanderburgh	Evansville	10 S. 11th Ave	SLAMS	09/10/09	Continuous	054	Micro	Highest Conc	37.977222	-87.596439	Evansville, IN-KY	No
CO MONITORING METHOD: 054 - THERMO ELECTRON 48C, 48i 093 - TELEDYNE INSTR. 300EU														

Lead (Pb)

Revised Pb NAAQS and Monitoring

On October 15, 2008 U.S.EPA promulgated a new lead (Pb) NAAQS and monitoring requirements. They were published as revisions to 40 CFR Parts 50, 51, 53, and 58. This new standard set the primary lead level at $0.15\mu\text{g}/\text{m}^3$ over a rolling three (3) month mean concentration over a three (3) year period. The main monitoring emphasis places monitors near large lead emitting sources, those facilities emitting 1.0 tpy or more. On December 27, 2010, EPA lowered the emission threshold to 0.5 tpy. Any new sites which must be established due to the lowering of the emission threshold must be operational by December 27, 2011. These amendments expand the nation's lead monitoring network to better assess compliance with the revised NAAQS for Pb issued in 2008.

Monitoring Requirements

40 CFR Part 58 Appendix D, 4.5 specifies that Pb monitoring must be conducted taking into account Pb sources which are expected to or have been shown to contribute to a maximum Pb concentration in ambient air in excess of the NAAQS, the potential for population exposure, and logistics. At a minimum there must be one (1) source-oriented SLAMS site located to measure the maximum Pb concentration in ambient air resulting from each Pb source which emits 0.5 or more tons per year. Waivers may be granted if the state can demonstrate the Pb source will not contribute to a maximum Pb concentration in ambient air in excess of 50% of the NAAQS.

In addition, Pb monitoring is required at any NCore site in each CBSA with a population equal to or greater than 500,000 people. This site is located at Indpls–Washington Park and has been collecting data since 1999.

Collocated samplers are required at 15% of the sites operated by a PQAO or a minimum of one (1) per network. Indiana is required to operate one (1) collocated site.

Monitoring Scale

The appropriate scales for the source-oriented sites are either microscale (up to 100 meters) or middle scale (100 to 500 meters). The neighborhood scale (0.5 – 4.0 kilometers) is the appropriate scale for population-oriented monitoring.

Monitoring Methodology

Indiana utilizes TSP filter sampling with atomic absorption analysis to generate ambient Pb concentrations from the monitoring sites.

Monitoring Network

The Pb monitoring network in Indiana in 2011 consists of nine (9) sites. These sites are displayed in Figure 4, and detailed in Table 4.

Network Modifications

Indiana's current network meets the non-source-oriented SLAMS site requirements for the number of sites.

The Portage – Hwy 12 site was established as an interim site for Arcelor-Mittal Burns Harbor. The preferred site is located at Burns Harbor-Port of Indiana, much closer to the source and in a higher modeled isopleths. A Memorandum of Understanding between IDEM and the Port of Indiana has been finalized and the site will be moved by midsummer 2011.

The East Chicago – Aldis St. site will be relocated to another nearby site yet to be determined. The East Chicago water utility is closing this facility and requesting IDEM move its equipment before the shutdown.

The Evansville–Post Office site was discontinued as of March 22, 2011 when the last TSP/lead sample ran. The US Postal Service is discontinuing the use of the current building as a post office and has requested IDEM move its equipment. IDEM has decided to discontinue TSP/lead sampling at this site because the total concentration of lead monitored at this site has been substantially lower than the NAAQS. From April 2008 through March 2011 the lowest design value at this site was 0.00 ug/m^3 and the highest was 0.01 ug/m^3 . The highest individual lead concentration occurred in June of 2010 at 0.019 ug/m^3 , well below the 0.15 ug/m^3 NAAQS.

The Indpls–Quemetco/Girls School Rd. site is to be discontinued at the end of 2011. Concentrations from this site are less than the concentrations from the Indpls–Rockville Rd. site that is located 0.80 kilometers away. Both sites are monitoring the same source, but both sites report slightly different numbers due to prevailing wind directions. The Rockville Rd. site is located north of the source while the Girls School Rd. site is located east of the source. The design values at the Girls School Rd. site are lower than the Rockville Rd. site. A comparison of the design values from the two sites over the past three years is in Table 3.

The new standard of 0.15 ug/m^3 lead concentration over a three month rolling average will be further discussed in Appendix B “2012 Indiana Lead Monitoring Plan.”

Table 3 - Design Value Comparison Between Indpls-Girls School Rd. and Indpls-Rockville Rd.

Concentrations in ug/m ³		
Ending Month of 3-month average period	Indpls – Girls School Rd.	Indpls – Rockville Rd.
January 2008	0.01	0.04
February 2008	0.01	0.03
March 2008	0.02	0.05
April 2008	0.03	0.03
May 2008	0.03	0.04
June 2008	0.01	0.04
July 2008	0.01	0.05
August 2008	0.01	0.04
September 2008	0.01	0.03
October 2008	0.01	0.02
November 2008	0.01	0.02
December 2008	0.01	0.02
January 2009	0.01	0.02
February 2009	0.01	0.01
March 2009	0.01	0.02
April 2009	0.01	0.03
May 2009	0.01	0.03
June 2009	0.01	0.02
July 2009	0.00	0.02
August 2009	0.00	0.01
September 2009	0.01	0.02
October 2009	0.01	0.02
November 2009	0.01	0.01
December 2009	0.01	0.01
January 2010	0.01	0.01
February 2010	0.01	0.01
March 2010	0.01	0.01
April 2010	0.01	0.02
May 2010	0.01	0.02
June 2010	0.01	0.03
July 2010	0.01	0.02
August 2010	0.01	0.03
September 2010	0.01	0.04
October 2010	0.01	0.05
November 2010	0.01	0.08
December 2010	0.01	0.06

Figure 4 – Lead Monitoring Network

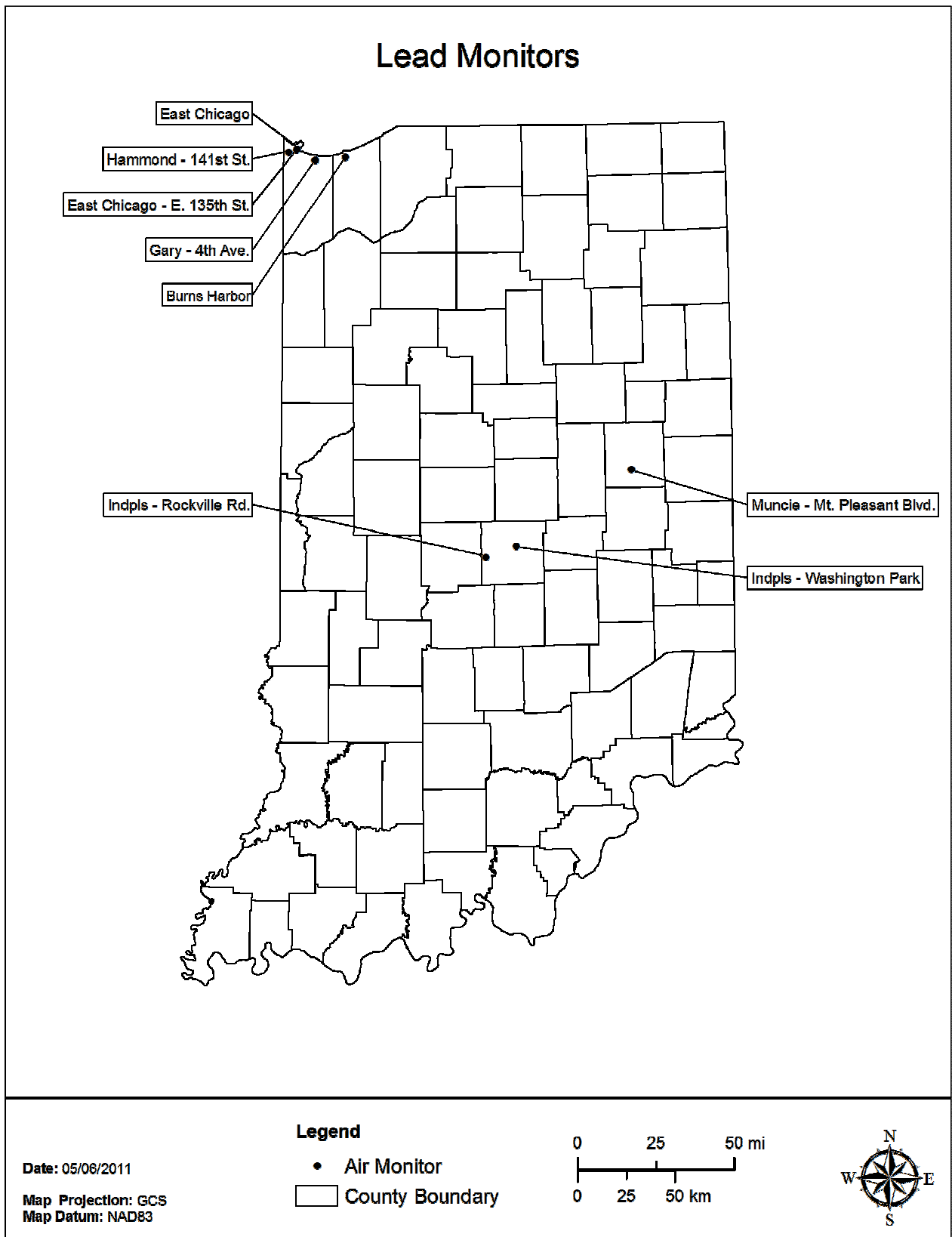


Table 4 – Lead Monitoring Network

Parameter Code: 12128 Pb - Lead															
RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management															
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Source Oriented?	Site Change Proposed?
10350009	Muncie - Mt. Pleasant Blvd.	Delaware	Muncie	2601 W. Mt. Pleasant Blvd.	SLAMS	01/02/10	6-Day	803	Middle	Source Oriented	40.58417	-85.45021	Muncie	Yes Exide	No
10890023	East Chicago - Aldis St.	Lake	East Chicago	Water Filtration Plant, 3330 Aldis St.	SLAMS	01/01/97	6-Day	803	Middle	Source Oriented	41.652778	-87.439444	Chicago-Naperville-Joliet, IL	Yes Mittal East	Relocate
1089	East Chicago	Lake	East Chicago		SLAMS	2012	6-Day	803	Middle	Source Oriented			Chicago-Naperville-Joliet, IL	Yes Mittal East	Relocation
10890032	Gary - 4th Ave	Lake	Gary	Gary South Shore RailCats, One Stadium Plaza	SLAMS	01/02/10	6-Day	803	Middle	Source Oriented	41.603582	-87.332658	Chicago-Naperville-Joliet, IL	Yes US Steel	No
10890033	East Chicago - E. 135th St.	Lake	East Chicago	Abraham Lincoln Elem. Sch., E. 135th St.	SLAMS	01/02/10	6-Day	803	Middle	Source Oriented	41.649064	-87.447256	Chicago-Naperville-Joliet, IL	Yes Mittal West	No
10892008	Hammond - 141st St.	Lake	Hammond	1300 E. 141st Street	SLAMS	01/01/77	6-Day	803	Neigh	Pop Exp	41.639444	-87.493611	Chicago-Naperville-Joliet, IL	No	No
10892008	Hammond - 141st St.	Lake	Hammond	1300 E. 141st Street	QA Collocated	01/01/07	6-Day	803	Neigh	Quality Assurance	41.639444	-87.493611	Chicago-Naperville-Joliet, IL	No	No
10970063	Indpls - Rockville Rd.	Marion	Indianapolis	7601 Rockville Road	SLAMS	01/01/84	6-Day	803	Middle	Highest Conc	39.760833	-86.297222	Indianapolis-Carmel	Yes Quemetco	No
10970063	Indpls - Rockville Rd.	Marion	Indianapolis	7601 Rockville Road	QA Collocated	10/01/00	6-Day	803	Middle	Quality Assurance	39.760833	-86.297222	Indianapolis-Carmel	Yes Quemetco	No
10970076	Indpls - Quemetco	Marion	Indianapolis	230 S. Girls School Road	SLAMS	05/06/91	6-Day	803	Middle	Highest Conc	39.758889	-86.289722	Indianapolis-Carmel	Yes Quemetco	Discontinue
10970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St.	SLAMS / NCORE	04/18/99	6-Day	803	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No	No
11270023	Portage - Hwy. 12	Porter	Portage	Bethlehem Steel Waste Lagoon, Hwy 12	SLAMS	01/02/10	6-Day	803	Middle	Source Oriented	41.616618	-87.146959	Chicago-Naperville-Joliet, IL	Yes Arcelor Mittal	Relocate
11270027	Burns Harbor-Port of Indiana	Porter			SLAMS	2011	6-Day	803	Middle	Source Oriented			Chicago-Naperville-Joliet, IL	Yes Arcelor Mittal	Relocation
11630006	Evansville - Post Office	Vanderburgh	Evansville	800 Sycamore St	Special Purpose	03/11/09	6-Day	803	Middle	Pop Exp	37.975278	-87.567778	Evansville, IN-KY	No	Discontinue
MONITORING METHOD: 803 - HI-VOL SAMPLER/ATOMIC ABSORPTION ANALYSIS															

Oxides of Nitrogen (NO, NO₂, NO_x, NO_y)

Monitoring Requirements

40 CFR Part 58 Appendix D, 4.3 details the requirements for NO₂ monitoring. There are no minimum requirements for the number of NO₂ monitoring sites. Continued operation of current NO₂ SLAMS using FRM or FEM is required until discontinuation is approved by U.S.EPA. If NO₂ monitoring is ongoing, at least one site should be a “maximum concentration” monitoring site.

40 CFR Part 58 Appendix D 3(b) and 40 CFR Part 58 Appendix D, 4.3 state that NO/NO_y measurements should be included at the NCore multi-pollutant monitoring sites and the PAMS program. NO/NO_y monitors are used at these sites because it is important to collect data on total reactive nitrogen species for understanding O₃ photochemistry.

On February 9, 2010, the Federal Register amended 40 CFR Parts 50 and 58 establishing a new NO₂ NAAQS for one (1) hour concentrations, and new monitoring requirements to be implemented by January 1, 2013. This new roadside NO₂ monitoring will be required within the Indianapolis-Carmel MSA. Preliminary site work has begun this year. Candidate road segments will be selected based on total annual average daily traffic (AADT), commercial vehicle fraction and site feasibility based on proximity and safety concerns. IDEM is working with INDOT in order to identify these road segments. Indiana expects to have a site in place next calendar year.

Monitoring Methodology

The NO, NO₂ and NO_x network uses the Thermo Environmental Model 42c and the 42i chemiluminescence monitors to collect data. The API Model 200EU/501 NO_y Trace level/Ultra-sensitive analyzer is used to collect NO and NO_y data at the Indpls - Washington Park NCore site (180970078).

Monitoring Network

Indiana operates four (4) NO₂ monitors and one (1) trace level monitor as displayed in Figure 5. The current network, along with any changes planned in 2012, is listed in Table 5.

Network Modifications

A new roadside NO₂ monitoring site in the Indianapolis-Carmel MSA is expected to be in place sometime during 2012.

Figure 5 – Oxides of Nitrogen Monitoring Network

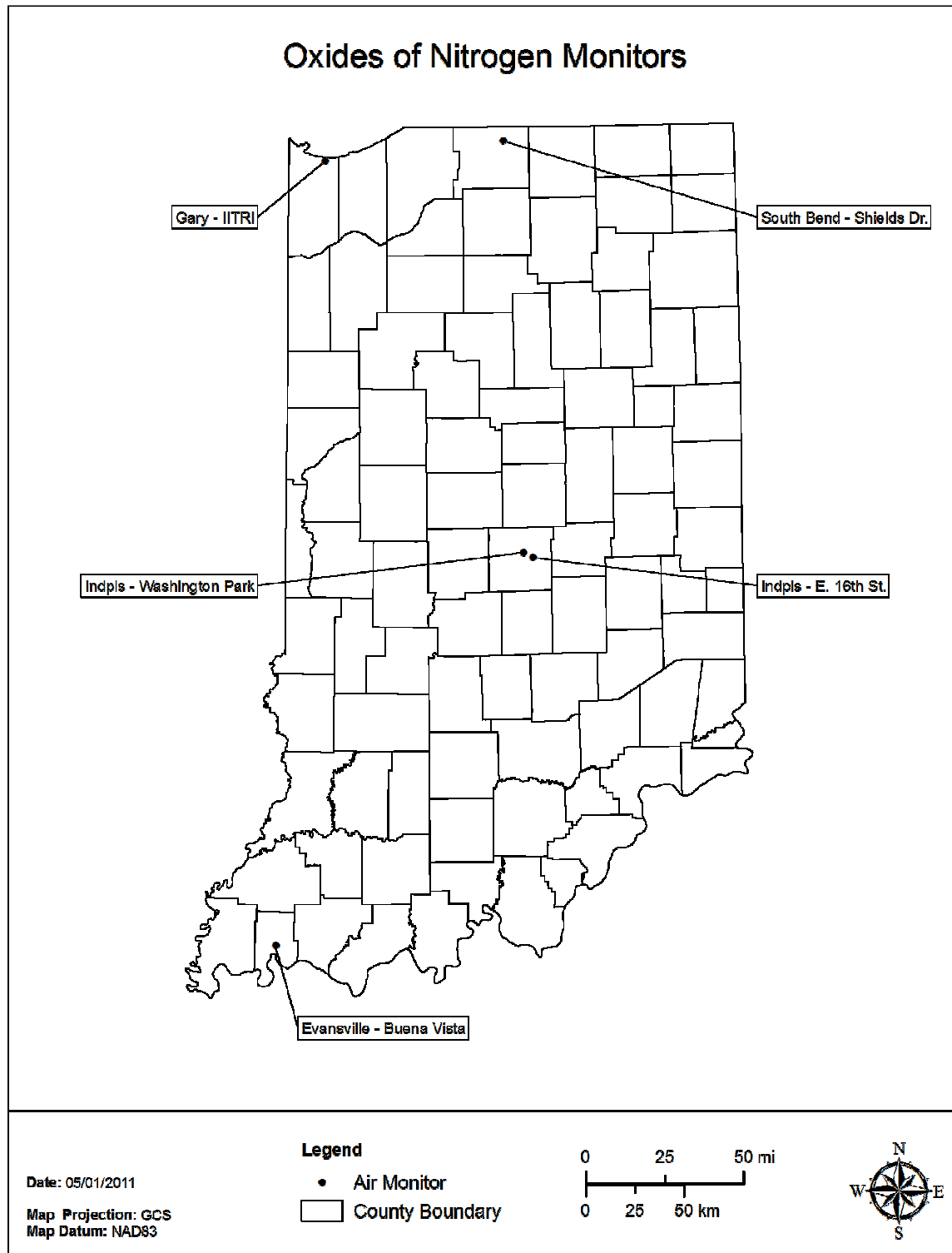


Table 5 – Oxides of Nitrogen (NO, NO₂, NO_x, NO_y) Monitoring Network

Parameter Code: 42602		NO, NO ₂ , NO _x , NO _y - Oxides of Nitrogen												
RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management														
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	06/27/95	Continuous	074	Neigh	Highest Conc	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	No
180970073	Indpls - E. 16th St.	Marion	Indianapolis	6125 E. 16th St.	SLAMS	04/02/90	Continuous	074	Neigh	Pop Exp	39.789167	-86.060833	Indianapolis-Carmel	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	NCORE	01/01/10	Continuous	099	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No
18_____	Roadside	Marion	Indianapolis		Near-Road	2012	Continuous	074	Micro	Highest Conc			Indianapolis-Carmel	Add
181410015	South Bend - Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	SLAMS	06/01/06	Continuous	074	Neigh	Pop Exp	41.696692	-86.214683	South Bend-Mishawaka	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS	07/08/09	Continuous	074	Neigh	Pop Exp	38.013333	-87.577778	Evansville, IN-KY	No
<div>NO_x MONITORING METHOD: 074 - THERMO ELECTRON 42C, 42i 099 - TELEDYNE INSTR. 200EU</div>														

Ozone (O₃)

Monitoring Requirements

Table D-2 in 40CFR Part 58 Appendix D details the number of O₃ sites required in each MSA. The number of sites is based on the population of an MSA and if the design value exceeds 85% of the standard (0.064 ppm) for that area. Table 6 lists the requirements stated in Part 58. Table 7 lists the requirements as they relate to Indiana. There are five (5) MSAs which cross state lines. Except for Cincinnati, Indiana meets the requirement for the full MSA, in the multi-agency MSAs. An agreement between the Hamilton County Department of Environmental Services (Cincinnati, OH) and IDEM specifies that Hamilton County will fulfill the O₃ monitoring requirements in this MSA. In the absence of an agreement, Indiana would be required to operate two (2) sites in the Cincinnati MSA and twenty-one (21) monitoring sites overall.

Monitoring Season

Table D-3 of Appendix D of Part 58 defines the O₃ monitoring season for all of the states. Indiana's monitoring season is from April 1 to September 30. Indiana operates one (1) site in Illinois (West Union) and two (2) sites (Charlestown State Park and New Albany) in the Louisville MSA. As the monitoring season extends through October in Illinois and Kentucky, Indiana operates these three (3) sites through October as well.

It is anticipated that new monitoring requirements may be promulgated in July 2011. If any changes in the monitoring season are required to begin in 2012, Indiana will implement any season modification at that time.

Data

The design value for an area, usually a county or an MSA, is determined by the three (3) year average of the 4th highest daily 8-hour maximum from the highest site in the area. If this value is greater than 0.075 ppm then the area is considered to be in nonattainment of the NAAQS. If the air quality improves and the design value is 0.075 ppm or less, then the area may be reclassified as a maintenance area. The design values for all sites for the most recent sampling period (2008 – 2010) along with the current O₃ designation status (based on current NAAQS of 0.075 ppm) are illustrated in Figure 6.

Monitoring Methodology

All monitoring sites in Indiana use O₃ analyzers from Thermo Electron, Models 49c, or 49i. These monitors use ultraviolet absorption photometry. Air is drawn through a sample cell where ultraviolet light (254 nm wavelength) passes through. Any light that is not absorbed by the ozone is then converted into an electrical signal proportional to the ozone concentration.

Monitoring Network

Currently there are forty-two (42) monitoring sites in Indiana's O₃ monitoring network as displayed in Figure 7. The O₃ monitoring network with any changes proposed for 2012 is in Table 8.

Network Modifications

The Granger site (181411007) was to be relocated prior to the 2010 monitoring season because of siting criteria issues. This task has not been accomplished due to not being able to find a suitable site. The site search will be conducted during the remainder of 2011 with the anticipated start at the new site of April 1, 2012.

Table 6 – SLAMS Minimum O₃ Monitoring Requirement

# of Sites Required per Population and Design Value		
MSA Population	3yr Design Value ≥ 85% of NAAQS (0.064ppm)	3 yr Design Value < 85% of NAAQS (0.064ppm)
>10 million	4	2
4-10 million	3	1
350,000 - 4 million	2	1
50,000 - 350,000	1	0

Table 7 – SLAMS O₃ Sites Required for Indiana

MSA	MSA Population (2010)	Design Value (ppm) (2008-2010)	# of Sites Required per CFR	Current No. of Sites	2012 No. of Sites
Anderson	131,636	0.064	0	1	1
Bloomington	192,714	0.071	1	1	1
Chicago-Naperville-Joliet, IL-IN-WI	9,461,105	0.074 ¹	3	24 ¹	-
Chicago-Naperville-Joliet, IL-IN-WI	9,461,105	0.067 ²	3	5 ²	5
Cincinnati-Middletown, OH-KY-IN	2,130,151	0.078 ¹	2	10 ¹	
Cincinnati-Middletown, OH-KY-IN	2,130,151	No Data ²	2	0 ²	0
Columbus	96,794	No Data	0	0	0
Elkhart-Goshen	197,559	0.064	1	1	1
Evansville, IN-KY	358,676	0.073 ¹	2	7 ¹	-
Evansville, IN-KY	358,676	0.070 ²	2	6 ²	6
Fort Wayne	416,257	0.067	2	2	2
Indianapolis-Carmel	1,756,241	0.073	2	11	11
Kokomo	98,688	No Data	0	0	0
Lafayette	201,789	0.066	1	1	1
Louisville-Jefferson County, KY-IN	1,283,566	0.075 ¹	2	7 ¹	-
Louisville-Jefferson County, KY-IN	1,283,566	0.073 ²	2	2 ²	2
Michigan City-LaPorte	111,467	0.065	1	2	2
Muncie	117,671	0.065	1	1	1
South Bend-Mishawaka, IN-MI	319,224	0.071 ¹	1	4 ¹	-
South Bend-Mishawaka, IN-MI	319,224	0.063 ²	0	3 ²	3
Terre Haute	172,425	0.063	0	2	2
Non MSA					
Clark, IL		0.064		1	1
Huntington		0.061		1	1
Jackson		0.067		1	1
Perry		0.070		1	1
	DV ≥ 85% of NAAQS				
	¹ Information for full MSA				
	² Information for Indiana's portion of MSA				
# of sites needed if Indiana meets all multi-state MSA requirements			21		
			Sites in Indiana Network	42	42

Figure 6 – O₃ Design Values (2008 – 2010)

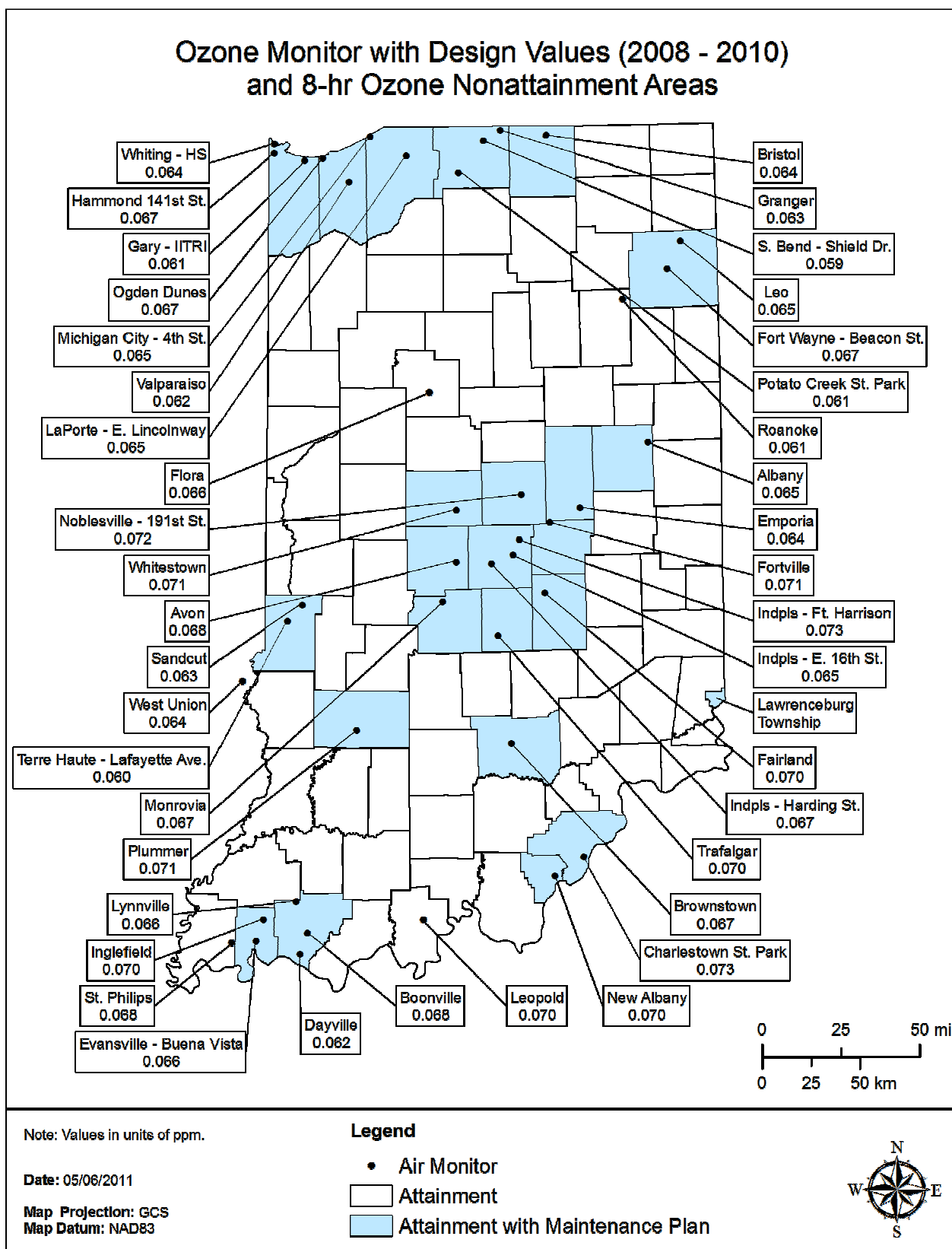


Figure 7 – O₃ Monitoring Network

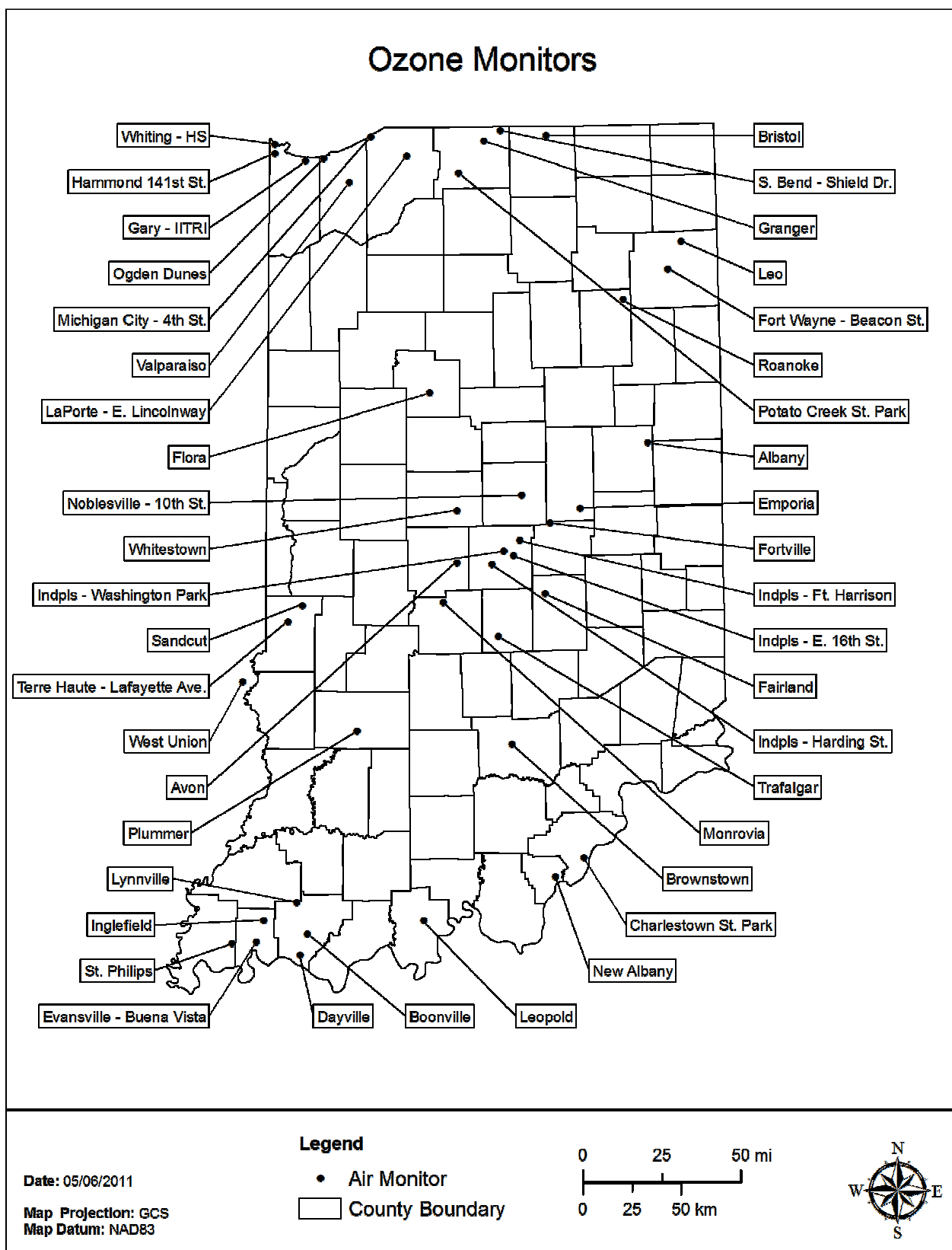


Table 8 – Ozone Monitoring Network

Parameter Code: 44201				O ₃ - Ozone											
RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management															
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?	
180030002	Leo HS	Allen	Leo	Leo HS, 14600 Amstutz Rd.	SLAMS	04/01/86	Continuous	047	Urban	Highest Conc	41.221667	-85.017222	Ft. Wayne	No	
180030004	Ft Wayne - Beacon St.	Allen	Fort Wayne	2022 N. Beacon St.	SLAMS	07/01/79	Continuous	047	Neigh	Pop Exp	41.094722	-85.101944	Ft. Wayne	No	
180110001	Whitestown	Boone		Perry - Worth Elem Sch., 3900 E. 300 S, Lebanon	SLAMS	04/01/01	Continuous	047	Urban	Highest Conc	39.997484	-86.395172	Indianapolis-Carmel	No	
180150002	Flora	Carroll		Flora Airport, 481 S. 150 W., Flora	SLAMS	04/01/01	Continuous	047	Urban	Pop Exp	40.540556	-86.553056	Lafayette	No	
180190008	Charlestown State Park	Clark		Charlestown State Park, 12500 Hwy 62, Charlestown	SLAMS	05/04/07	Continuous	047	Urban	Highest Conc	38.393833	-85.664167	Louisville/Jefferson Co.	No	
180350010	Albany	Delaware	Albany	Albany Elem. Sch., 706 W. State St.	SLAMS	04/01/01	Continuous	047	Urban	Pop Exp	40.300000	-85.245556	Muncie	No	
180390007	Bristol	Elkhart	Bristol	Bristol Elem Sch., 705 Indiana Ave.	SLAMS	04/01/02	Continuous	047	Urban	Pop Exp	41.718050	-85.830550	Elkhart-Goshen	No	
180431004	New Albany	Floyd	New Albany	Green Valley Elem. Sch., 2230 Green Valley Road	SLAMS	01/01/77	Continuous	047	Neigh	Highest Conc	38.308056	-85.834167	Louisville/Jefferson Co.	No	
180550001	Plummer	Greene		2500 S. 275 W	SLAMS	04/03/00	Continuous	047	Regional	Upwind Bkgrd	38.985578	-86.990120	Bloomington	No	
180570006	Noblesville - 191st St.	Hamilton	Noblesville	Our Lady of Grace Catholic Church, 9900 E. 191st St.	SLAMS	05/13/10	Continuous	047	Urban	Highest Conc	40.068297	-85.992451	Indianapolis-Carmel	No	
180590003	Fortville	Hancock	Fortville	Fortville Municipal Bldg., 714 E Broadway	SLAMS	06/01/87	Continuous	047	Urban	Highest Conc	39.935008	-85.840513	Indianapolis-Carmel	No	
180630004	Avon	Hendricks	Avon	7203 E. US 36, Avon	SLAMS	04/01/00	Continuous	047	Urban	Pop Exp	39.758967	-86.397148	Indianapolis-Carmel	No	
180690002	Roanoke Elem School	Huntington	Roanoke	Roanoke Elem. Sch., 423 W. Vine St.	SLAMS	04/14/00	Continuous	047	Urban	Upwind Bkgrd	40.960556	-85.380000	Non-MSA County	No	
180710001	Brownstown	Jackson		225 W & 300 N, Brownstown	SLAMS	04/04/00	Continuous	047	Regional	Upwind Bkgrd	38.920798	-86.080523	Non-MSA County	No	
180810002	Trafalgar	Johnson	Trafalgar	200 W. Pearl St.	SLAMS	04/01/97	Continuous	047	Urban	Pop Exp	39.417203	-86.152395	Indianapolis-Carmel	No	
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	07/01/95	Continuous	047	Neigh	Pop Exp	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	No	
180890030	Whiting HS	Lake	Whiting	Whiting HS, 1751 Oliver St.	SLAMS	04/01/04	Continuous	047	Urban	Highest Conc	41.681384	-87.494722	Chicago-Naperville-Joliet, IL	No	
180892008	Hammond - 141st St.	Lake	Hammond	1300 E. 141st St.	SLAMS	01/01/76	Continuous	047	Neigh	Pop Exp	41.639444	-87.493611	Chicago-Naperville-Joliet, IL	No	
180910005	Michigan City - 4th St.	La Porte	Michigan City	NIPSCO Gas Station, 341 W. 4th St.	SLAMS	05/24/90	Continuous	047	Urban	Pop Exp	41.716944	-86.907500	Michigan City-LaPorte	No	
180910010	LaPorte - E. Lincolnway	La Porte	La Porte	2011 E. Lincolnway	SLAMS	05/07/97	Continuous	047	Urban	Pop Exp	41.629167	-86.684722	Michigan City-LaPorte	No	

Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
180950010	Emporia	Madison		East Elem. Sch., 893 E. US 36, Pendleton	SLAMS	04/05/93	Continuous	047	Urban	Pop Exp	40.002500	-85.656944	Anderson	No
180970050	Indpls - Ft Harrison	Marion	Indianapolis	5753 Glenn Rd	SLAMS	12/01/79	Continuous	047	Urban	Highest Conc	39.858961	-86.021341	Indianapolis-Carmel	No
180970057	Indpls - Harding St.	Marion	Indianapolis	1321 Harding St.	SLAMS	03/01/82	Continuous	047	Neigh	Pop Exp	39.749019	-86.186314	Indianapolis-Carmel	No
180970073	Indpls - E. 16th St.	Marion	Indianapolis	6125 E. 16th St.	SLAMS	04/02/90	Continuous	047	Neigh	Pop Exp	39.789167	-86.060833	Indianapolis-Carmel	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	NCORE	04/01/09	Continuous	047	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No
181090005	Monrovia	Morgan	Monrovia	Monrovia HS., 135 S. Chestnut St,	SLAMS	04/01/97	Continuous	047	Urban	Pop Exp	39.575596	-86.477914	Indianapolis-Carmel	No
181230009	Leopold	Perry		Perry Central HS, 19856 Old St Rd 37, Leopold	SLAMS	04/01/04	Continuous	047	Urban	Highest Conc	38.113101	-86.603611	Non-MSA County	No
181270024	Ogden Dunes	Porter	Ogden Dunes	Water Treatment Plant, 84 Diana Rd	SLAMS	11/01/83	Continuous	047	Urban	Highest Conc	41.617500	-87.199167	Chicago-Naperville-Joliet, IL	No
181270026	Valparaiso	Porter	Valparaiso	Valpo Water Department, 1000 Wesley St.	SLAMS	04/01/98	Continuous	047	Urban	Pop Exp	41.510278	-87.038611	Chicago-Naperville-Joliet, IL	No
181290003	St Phillips	Posey		2027 South St. Phillips Rd., Evansville	SLAMS	07/01/96	Continuous	047	Urban	Upwind Bkgrd	38.005278	-87.718333	Evansville, IN-KY	No
181410010	Potato Creek State Park	St Joseph		Potato Creek St. Park, 25601 St. Rd 4, North Liberty	SLAMS	04/24/91	Continuous	047	Urban	Upwind Bkgrd	41.551667	-86.370556	South Bend-Mishawaka	No
181410015	South Bend-Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	SLAMS	06/06/06	Continuous	047	Neigh	Pop Exp	41.696692	-86.214683	South Bend-Mishawaka	No
181411007	Granger	St Joseph	Granger	Harris Twshp Fire Station, 12481 Anderson Rd.	SLAMS	06/01/79	Continuous	047	Urban	Highest Conc	41.742583	-86.110556	South Bend-Mishawaka	Relocate
	Granger	St Joseph	Granger		SLAMS	2011	Continuous	047	Urban	Highest Conc			South Bend-Mishawaka	Relocation
181450001	Fairland	Shelby		Triton Central MS, 4740 W. 600N , Fairland	SLAMS	04/01/00	Continuous	047	Urban	General Bkgrd	39.613423	-85.870648	Indianapolis-Carmel	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS	07/08/09	Continuous	047	Neigh	Pop Exp	38.013333	-87.577778	Evansville, IN-KY	No
181630013	Inglefield	Vanderburgh		Scott School, 14940 Old State Road	SLAMS	05/01/80	Continuous	047	Urban	Highest Conc	38.113889	-87.536944	Evansville, IN-KY	No
181670018	Terre Haute - Lafayette Ave.	Vigo	Terre Haute	961N. Lafayette Ave.	SLAMS	07/01/83	Continuous	047	Neigh	Pop Exp	39.486111	-87.401389	Terre Haute	No
181670024	Sandcut	Vigo		7597 N. Stevenson Rd., Terre Haute	SLAMS	04/01/01	Continuous	047	Urban	Pop Exp	39.560556	-87.313056	Terre Haute	No
181730008	Boonville	Warrick	Boonville	Boonville HS, 300 N. 1st St.	SLAMS	04/16/91	Continuous	047	Urban	Highest Conc	38.051944	-87.278333	Evansville, IN-KY	No
181730009	Lynnville	Warrick		Tecumseh HS, 5244 State Rd 68, Lynnville	SLAMS	05/02/91	Continuous	047	Urban	Highest Conc	38.194444	-87.341389	Evansville, IN-KY	No
181730011	Dayville	Warrick		3488 Eble Rd., Newburgh	SLAMS	04/01/07	Continuous	047	Urban	Highest Conc	37.954450	-87.321933	Evansville, IN-KY	No
170230001	West Union	Clark, IL		416 S. Hwy 1, West Union, IL	SLAMS	04/01/01	Continuous	047	Urban	General Bkgrd	39.210883	-87.668416	Non-MSA County	No

03 MONITORING METHOD: 047 - THERMO ELECTRON 49C, 49i

Particulate Matter (PM₁₀)

Monitoring Requirements

The requirements for the design of the PM₁₀ monitoring network are listed in 40 CFR Part 58 Appendix D 4.6. Indiana must operate the minimum number of sites as defined by the MSA population and the past design value of the area. Table 9 lists the sites required per MSA along with the design value in the proper category for each MSA. The current and proposed networks are also listed. There are five (5) MSAs which cross state lines. Indiana meets the requirement for the number of sites for the full MSA, in the multi-agency MSAs, except for Cincinnati and Louisville. IDEM has an agreement with HCDOES for the Cincinnati MSA to specify the sites which will operate in each district to fulfill the PM₁₀ monitoring requirements in the MSA. An agreement with Louisville Metropolitan Air Pollution Control District (APCD) regarding the Louisville MSA was proposed by Indiana and was not acted upon by APCD. In the absence of an agreement, Indiana may be required to operate two (2) to four (4) sites in this MSA.

Collocated samplers are required at fifteen percent (15%) of the sites in the network to determine monitoring precision. IDEM is required to operate three (3) collocated samplers.

Monitoring Methodology

Intermittent PM₁₀ samples are collected on a pre-weighed 46.2 mm Teflon filter. Air is drawn through an inlet designed to pass only particles smaller than 10 microns in diameter and across the filter for twenty-four (24) hours. It is then removed and weighed again. Concentrations are calculated by dividing the weight gain by the volume of air passed through the filter.

Continuous PM₁₀ concentrations are obtained by using an R&P TEOM 1400a which collects the particulate on a filter attached to an oscillating glass rod. The concentration of the particulate is proportional to the change in oscillating frequency.

Monitoring Network

Indiana currently operates sixteen (16) monitoring sites in the State as displayed in Figure 8. Concentrations at all sites except for two source-oriented sites in Northwest Indiana, Gary – ITRI (180890022) and Portage – Hwy 12 (181270023), are well under 50% of the daily NAAQS of 150ug/m³. Table 10 details the current PM₁₀ network and the modifications planned for 2012.

Network Modifications

There is one (1) network modification planned for 2012. Monitoring at Indpls-E 16th St. (180970073) will be discontinued due to very low design values. The design value of 40 ug/m³ is the lowest in the Indianapolis area. The network will still maintain three (3) collocated samplers to fulfill the monitoring requirements.

Table 9 – PM₁₀ Site Requirements

CFR Requirement	MSA Population		High Conc. ¹	Medium Conc. ²	Low Conc. ³		
	> 1,000,000	# of Required Sites =>	6-10	4-8	2-4		
	MSA	Population	MSA Design Value			# of Sites 2011	# of Sites 2012
	Chicago-Naperville-Joliet, IL-IN-WI	9,461,105			83 ^{4,6} / 78 ^{5,6}	16	
	Chicago-Naperville-Joliet, IL-IN-WI	9,461,105			83 ^{4,7} / 65 ^{5,7}	7	7
	Cincinnati-Middletown, OH-KY-IN	2,130,151			50 ⁶	5	
	Cincinnati-Middletown, OH-KY-IN	2,130,151			No Data ⁷	0	0
	Indianapolis-Carmel	1,756,241			67	5	4
	Louisville-Jefferson County, KY-IN	1,283,566			56 ⁶	3	
	Louisville-Jefferson County, KY-IN	1,283,566			48 ⁷	1	1
CFR Requirement	MSA Population		High Conc. ¹	Medium Conc. ²	Low Conc. ³		
	500,000 - 1,000,000	# of Required Sites =>	4-8	2-4	1-2		
	MSA	Population	MSA Design Value			# of Sites 2011	# of Sites 2012
	No MSAs in this category						
CFR Requirement	MSA Population		High Conc. ¹	Medium Conc. ²	Low Conc. ³		
	250,000 - 500,000	# of Required Sites =>	3-4	1-2	0-1		
	MSA	Population	MSA Design Value			# of Sites 2011	# of Sites 2012
	Evansville, IN-KY	358,676			40 ⁶	1	
	Evansville, IN-KY	358,676			40 ⁷	1	1
	Fort Wayne	416,257			No Data	0	0
	South Bend-Mishawaka, IN-MI	319,224			No Data	0	0
	South Bend-Mishawaka, IN-MI	319,224			No Data	0	0
CFR Requirement	MSA Population		High Conc. ¹	Medium Conc. ²	Low Conc. ³		
	100,000 - 250,000	# of Required Sites =>	1-2	0-1	0		
	MSA	Population	MSA Design Value			# of Sites 2011	# of Sites 2012
	Anderson	131,636			No Data	0	0
	Bloomington	192,714			No Data	0	0
	Elkhart-Goshen	197,559			No Data	0	0
	Kokomo	98,688			No Data	0	0
	Lafayette	201,789			No Data	0	0
	Michigan City-LaPorte	111,467			No Data	0	0
	Muncie	117,671			No Data	0	0
	Terre Haute	172,425			44	1	1
	Non MSA		Design Value			# of Sites 2011	# of Sites 2012
	Jasper	54,734			36	1	1
			¹ Exceeds NAAQS by 20% (180ug/m3).				
			² Exceeds 80% of NAAQS (120 ug/m3).				
			³ <80% of NAAQS (120 ug/m3).				
			⁴ Design value from source oriented site (not indicative of entire MSA).				
			⁵ Design value from population oriented sites.				
			⁶ Information for full MSA				
			⁷ Information for Indiana's portion of MSA				

Figure 8 – PM₁₀ Monitoring Network

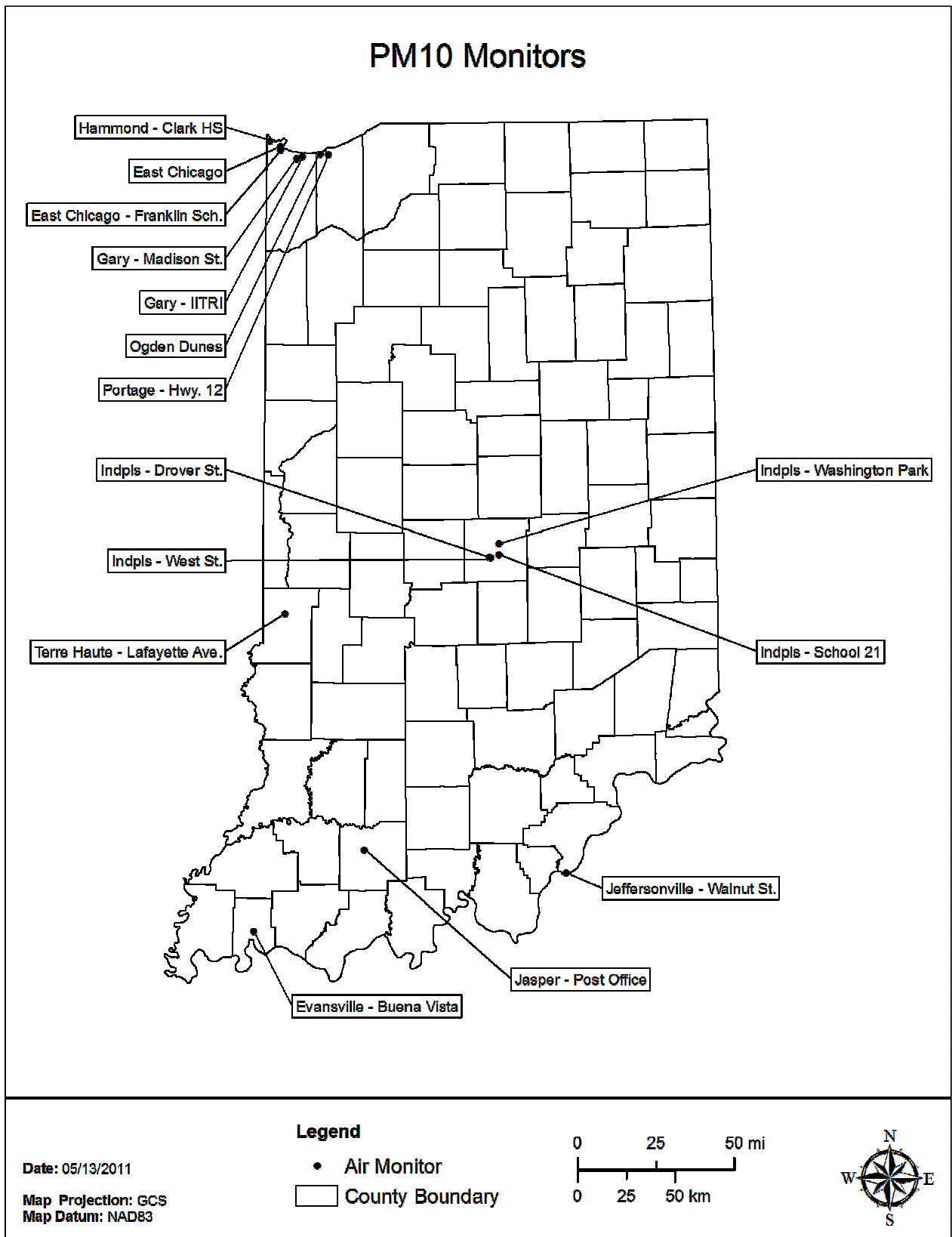


Table 10 – PM₁₀ Monitoring Network

Parameter Code: 81102		PM ₁₀ - Particulate Matter												
RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management														
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
180190006	Jeffersonville - Walnut St.	Clark	Jeffersonville	Jeffersonville PFAU, 719 Walnut St.	SLAMS	06/26/03	6-Day	127	Neigh	Pop Exp	38.277675	-85.740153	Louisville/Jefferson Co.	No
180372001	Jasper - Post Office	Dubois	Jasper	Jasper Post Office, 206 E. 6th St.	SLAMS	07/01/87	6-Day	127	Neigh	Highest Conc	38.391389	-86.929167	Non-MSA County	No
180890006	East Chicago - Franklin Sch.	Lake	East Chicago	Franklin School, Alder & 142nd St.	SLAMS	10/01/87	6-Day	127	Middle	Highest Conc	41.636111	-87.440833	Chicago-Naperville-Joliet, IL	No
180890006	East Chicago - Franklin Sch.	Lake	East Chicago	Franklin School, Alder & 142nd St.	QA Collocated	10/01/87	6-Day	127	Middle	Quality Assurance	41.636111	-87.440833	Chicago-Naperville-Joliet, IL	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	03/26/93	6-Day	127	Middle	Source Oriented	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	03/01/97	Continuous	079	Middle	Source Oriented	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	No
180890023	East Chicago - Aldis St.	Lake	East Chicago	Water Filtration Plant, 3330 Aldis St.	SLAMS	01/01/97	6-Day	127	Middle	Source Oriented	41.652778	-87.439444	Chicago-Naperville-Joliet, IL	Relocate
18089	East Chicago	Lake	East Chicago		SLAMS	2012	6-Day	127	Middle	Source Oriented			Chicago-Naperville-Joliet, IL	Relocation
180890031	Gary - Madison St.	Lake	Gary	Indiana American Water Co., 650 Madison St.	SLAMS	07/01/05	6-Day	127	Neigh	Pop Exp	41.598505	-87.342991	Chicago-Naperville-Joliet, IL	No
180890031	Gary - Madison St.	Lake	Gary	Indiana American Water Co., 650 Madison St.	QA Collocated	07/01/05	6-Day	127	Neigh	Quality Assurance	41.598505	-87.342991	Chicago-Naperville-Joliet, IL	No
180892010	Hammond - Clark HS	Lake	Hammond	Clark HS., 1921 Davis St.	SLAMS	10/01/87	6-Day	127	Middle	Pop Exp	41.678333	-87.508333	Chicago-Naperville-Joliet, IL	No

Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
180970043	Indpls - West St.	Marion	Indianapolis	1735 S. West St.	SLAMS	10/29/86	6-Day	127	Middle	Source Oriented	39.744957	-86.166496	Indianapolis-Carmel	No
180970071	Indpls - Drover St.	Marion	Indianapolis	National Printing Plate, 1415 Drover St.	SLAMS	03/03/87	6-Day	127	Middle	Highest Conc	39.747931	-86.175812	Indianapolis-Carmel	No
180970071	Indpls - Drover St.	Marion	Indianapolis	National Printing Plate, 1415 Drover St.	QA Collocated	01/05/98	6-Day	127	Middle	Quality Assurance	39.747931	-86.175812	Indianapolis-Carmel	No
180970073	Indpls - E. 16th St.	Marion	Indianapolis	6125 E. 16th St.	SLAMS	04/05/90	6-Day	127	Neigh	Pop Exp	39.789167	-86.060833	Indianapolis-Carmel	Discontinue
180970073	Indpls - E. 16th St.	Marion	Indianapolis	6125 E. 16th St.	QA Collocated	10/03/99	6-Day	127	Neigh	Quality Assurance	39.789167	-86.060833	Indianapolis-Carmel	Discontinue
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St.	SLAMS	07/01/10	6-Day	127	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No
180970084	Indpls - School 21	Marion	Indianapolis	IPS Sch 21, 2815 English Ave.	SLAMS	02/16/09	6-Day	127	Middle	Source Oriented	39.759083	-86.115556	Indianapolis-Carmel	No
181270023	Portage - Hwy 12	Porter	Portage	Bethlehem Steel Waste Lagoon, Hwy 12	SLAMS	10/01/95	Continuous	079	Neigh	Highest Conc	41.616618	-87.146959	Chicago-Naperville-Joliet, IL	No
181270024	Ogden Dunes	Porter	Ogden Dunes	Water Treatment Plant, 84 Diana Rd	SLAMS	01/01/89	6-Day	127	Neigh	Pop Exp	41.617500	-87.199167	Chicago-Naperville-Joliet, IL	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS	07/10/09	6-Day	127	Neigh	Pop Exp	38.013333	-87.577778	Evansville, IN-KY	No
181670018	Terre Haute - Lafayette Ave.	Vigo	Terre Haute	961N. Lafayette Ave.	SLAMS	07/01/88	6-Day	127	Neigh	Pop Exp	39.486111	-87.401389	Terre Haute	No
PM10 MONITORING METHODS: 079 - R & P TEOM 1400, 1400 A 127 - R&P 2025A Sequential														

Fine Particulate Matter (PM_{2.5})

Monitoring Requirements

40CFR Part 58, Appendix D 4.7 details the number of PM_{2.5} sites required in each MSA. The number of sites is based on the population of an MSA and if the design value for that area is greater or less than 85% of either NAAQS. Table 11 (Table D-5 of Appendix D) lists the minimum requirements as stated in Part 58. Table 12 lists the requirements as they relate to Indiana. Indiana meets the minimum number of sites for each MSA within Indiana's boundaries. There are five (5) MSAs which cross state lines. Except for Cincinnati, Indiana meets the requirement for the number of sites for the full MSA, in the multi-agency MSAs. An agreement between the HCDOES and IDEM specifies that HCDOES will fulfill the PM_{2.5} monitoring requirements in this MSA. In the absence of an agreement, Indiana would be required to operate three (3) sites in the Cincinnati MSA, and seventeen (17) monitoring sites overall.

In addition, 40 CFR, Appendix D, 4.7.2 states that "State, or where appropriate, local agencies must operate continuous fine particulate analyzers equal to at least one-half (round up) the minimum required sites listed in Table D-5 (Table 11) of this appendix. At least one required FRM/FEM monitor in each MSA must be collocated." As these requirements are applied to Indiana, eleven (11) would be required. Indiana meets this requirement in all MSAs, except Cincinnati and Louisville. Indiana has an agreement with HCDOES regarding the Cincinnati MSA. An agreement with APCD regarding the Louisville MSA was proposed by Indiana and was not acted upon by APCD. In the absence of an agreement, Indiana may be required to operate two (2) sites in this MSA.

Collocated samplers are required at 15% of the FRM/FEM sites operated by each PQAQO. IDEM is the sole PQAQO for Indiana and plans to operate thirty-four (34) sites. Indiana is required to have five (5) collocated samplers.

Table 11 – SLAMS Minimum PM_{2.5} Monitoring Site Requirements

Number of Sites per MSA and Design Value		
MSA Population	3 yr DV ≥ 85% of either NAAQS	3 yr DV < 85% of either NAAQS
> 1,000,000	3	2
500,000 - 1,000,000	2	1
50,000 - 500,000	1	0
	also	
	Statewide Background Site	1
	Statewide Transport Site	1
85% of Daily NAAQS = 29.75ug/m ³		
85% of Annual NAAQS = 12.75ug/m ³		

Monitoring Methodology

Intermittent PM_{2.5} is sampled by drawing air through a specially designed inlet that excludes particles larger than 2.5 microns in diameter. The remaining particles are collected on a Teflon™ Microfiber filter that is weighed before and after the sampling period to determine the particulate mass. Indiana has converted all samplers to the R&P 2025 Sequential Samplers (FEM) (EQPM-0202-145) to collect intermittent data. The normal sampling schedule varies, as determined by the regulations: four (4) sites sample every day, the remainder sample every 3rd day. Collocated monitors used for assessing data precision operate on a one (1) in six (6) day schedule.

Continuous data are collected using one of the following monitors: Met One BAM 1020 PM_{2.5} (FEM) (EQPM-0308-170), Thermo Scientific TEOM 1400a with Series 8500C FDMS (EQPM-0609-181), or Thermo Scientific Model 5030 SHARP (EQPM-0609-184). The BAM 1020 collects fine particulate through a sampling inlet onto a filter tape, using a beta ray transmission to measure the amount of particulate concentration collected during a specific sampling period. The TEOM 1400a collects the particulate on a filter attached to an oscillating microbalance. The concentration of the particulate is proportional to the change in the oscillating frequency. The SHARP 5030 collects the particulate onto a filter tape and uses a beta ray transmission to measure the amount of particulate concentration, similar to the BAM 1020 FEM. In addition, it also has an optical assembly that senses the light scattered by the aerosol and is constantly referenced to the measurement of the mass sensor.

Table 12 – Number of SLAMS PM_{2.5} Monitoring Sites Required for Indiana

MSA	MSA Population (2010)	Annual Design Value (ug/m3) (2008-2010)	Daily Design Value (ug/m3) (2008-2010)	# of Sites Required per CFR	2011 # of Sites	2012 # of Sites (IN)	2011 # of Cont. Mont.	2012 # of Cont. Mont. (IN)
Anderson	131,636	12.4	27	0	1	1	1	1
Bloomington	192,714	10.9	23	0	1	1	1	1
Chicago-Naperville-Joliet, IL-IN-WI (total MSA)	9,461,105	13.3 ¹	33 ¹	3	28 ¹	-	12 ¹	-
Chicago-Naperville-Joliet, IL-IN-WI (IN only)	9,461,105	13.3 ²	33 ²	3	8 ²	7	3 ²	3
Cincinnati-Middletown, OH-KY-IN (total MSA)	2,130,151	15.1 ¹	31 ¹	3	12 ¹	-	7 ¹	-
Cincinnati-Middletown, OH-KY-IN (IN only)	2,130,151	No Data ²	No Data ²	3	0 ²	0	0 ²	0
Columbus	96,794	No Data	No Data	0	0	1	0	1
Elkhart-Goshen	197,559	12.0	31	1	1	1	1	1
Evansville, IN-KY	358,676	12.8 ¹	28 ¹	1	4 ¹	-	2 ¹	-
Evansville, IN-KY	358,676	12.8 ²	28 ²	1	3 ²	2	1 ²	1
Fort Wayne	416,257	11.5	28	0	1	1	1	1
Indianapolis-Carmel	1,756,241	13.6	30	3	6	6	3	3
Kokomo	98,688	11.7	27	0	1	1	0	0
Lafayette	201,789	11.4	25	0	1	1	1	1
Louisville-Jefferson County, KY-IN (total MSA)	1,283,566	14.1 ¹	29 ¹	3	8 ¹	-	6 ¹	-
Louisville-Jefferson County, KY-IN (IN only)	1,283,566	14.1 ²	29 ²	3	3 ²	3	1 ²	1
Michigan City-LaPorte	111,467	10.7	27	0	1	1	0	0
Muncie	117,671	11.9	26	0	1	1	0	0
South Bend-Mishawaka, IN-MI (total MSA)	319,224	11.3 ¹	29 ¹	0	1 ¹	-	1 ¹	-
South Bend-Mishawaka, IN-MI (IN only)	319,224	11.3 ²	29 ²	0	1 ²	1	1 ²	1
Terre Haute	172,425	12.4	27	0	1	1	1	1
State Background Site - Knox Co. (relocate to Green Co.)		11.8	25	1	1	1		1
State Transport Site - Henry Co.		11.4	25	1	1	1		
Non MSAs								
Jasper	54,734	13.0	26		1	1		
Whitley Co.		10.6	32		1	1	1	1
Spencer Co.		12.3	26		1	1		
		DV ≥ 85% of NAAQS						
	¹ Information for full MSA							
	² Information for Indiana's portion of MSA							
# of sites needed if Indiana meets all multi-state MSA requirements				17				
# of continuous monitors required (1/2 of the required sites)(rounded up)				9				
			Sites in Indiana Network		35	34	16	18

Monitoring Network

In 2011 the Indiana PM_{2.5} monitoring network consists of thirty-five (35) monitoring sites. The number of monitoring sites includes the operational sites at the beginning of the year, and the southeast Hamilton County (Fishers area) site. This site had been proposed to be operational in 2010. Locations had to be changed, and the agreements necessary to install this site are still being negotiated. It is anticipated that this site will be established prior to the end of 2011.

Continuous monitors will be collecting data at eighteen (18) of the site locations in 2012.

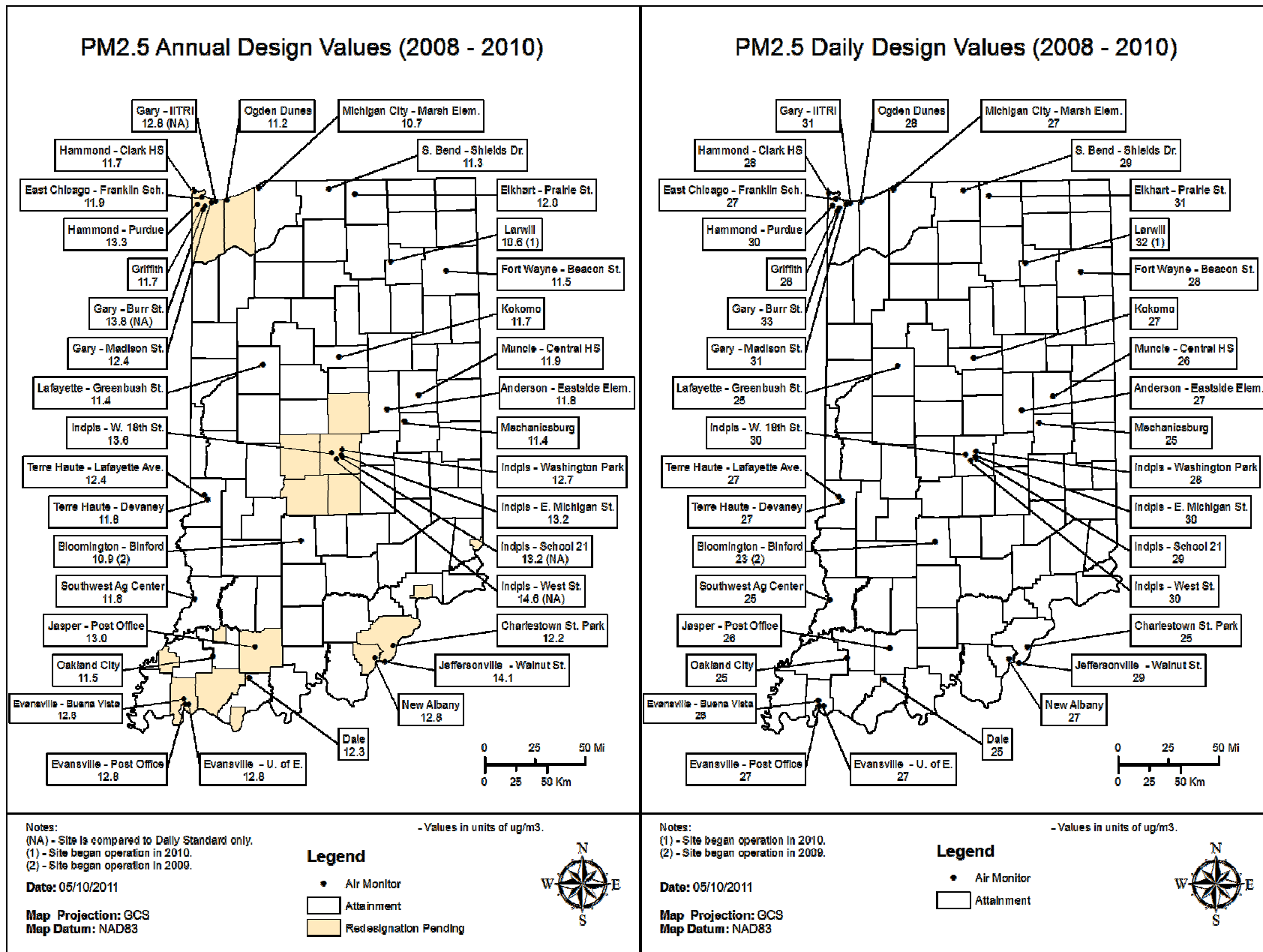
Data / Design Value

Only the intermittent data collected from the FEM samplers are eligible for comparison to the NAAQS and used for calculation of the design value for a site. The continuous data are used for AQI calculations and AIRNow mapping. The continuous data will continue to be compared to the intermittent data to determine when it would be appropriate to use it for NAAQS comparison purposes. IDEM will submit a proposal to EPA in the fourth quarter of 2011 outlining its plan and timeline for converting the continuous SPMs to SLAMS for NAAQS comparison.

A site's annual design value is calculated by averaging the weighted annual averages from a site over a three (3) year period. The highest site design value in an MSA is generally determined to be the design value for the area. It is compared to the NAAQS to determine attainment/nonattainment for the area. Similarly, a site's daily design value is obtained by averaging the 98th percentile values from a three (3) year period. This value is then compared to the daily NAAQS, thirty-five (35) ug/m³ to determine attainment/nonattainment of the daily standard.

The design values for all sites for the most recent sampling period (2008 - 2010) along with the designation status of areas for PM_{2.5} are on the maps in Figure 9. Currently all counties in Indiana meet the NAAQS for PM_{2.5}.

Figure 9 – PM_{2.5} Site Design Values



Network Modifications

PM_{2.5} monitoring will be conducted at thirty-five (35) sites in 2011 and at thirty-four (34) sites in 2012. The PM_{2.5} monitoring network with the changes proposed for 2012 is in Table 19. A map of the 2012 network is in Figure 14.

The Evansville – Post Office (181630020) site was discontinued March 22, 2011 due to loss of site accessibility. Summaries of the data and design values from the three (3) Evansville sites are in Tables 13 and 14. The concentrations at all sites have been trending downward since the sites were established (excepting 2005) as seen in Figures 10 and 11. Evansville – Post Office's annual design value has always trended with or been lower than the other two Evansville sites and the daily design values have been within one (1) ug/m³ since 2000 - 2002, excepting 2004 - 2006 and 2005 - 2007. Since this site was no longer the 'design value site' for the county in 2008 - 2010, the site will not be relocated.

Table 13 – Evansville Sites Data Comparison

Data							
Annual Average				98 th Percentile			
Year	Post Office and Civic Center	Buena Vista Rd and Mill Rd	University of Evansville	Year	Post Office and Civic Center	Buena Vista Rd and Mill Rd	University of Evansville
2000	16.17	16.17	15.70	2000	37.3	34.3	33.5
2001	15.45	15.15	16.16	2001	36.4	34.2	37.9
2002	15.36	15.27	15.24	2002	46.7	44.9	46.2
2003	14.93	15.27	15.09	2003	34.5	34.1	35.9
2004	13.23	13.46	13.68	2004	28.3	27.6	28.3
2005	16.49	16.29	16.67	2005	42.5	41.5	37.0
2006	13.72	14.05	14.15	2006	30.5	27.9	29.5
2007	13.91	14.23	14.21	2007	33.6	29.9	31.5
2008	12.58	12.70	12.53	2008	27.2	24.7	26.5
2009	12.32	12.28	12.49	2009	26.2	27.7	25.5
2010	13.43	12.83	13.40	2010	26.4	30.4	29.2

Table 14 – Evansville Sites Design Value Comparison

Design Values							
Annual				Daily			
Year	Post Office and Civic Center	Buena Vista Rd and Mill Rd	University of Evansville	Year	Post Office and Civic Center	Buena Vista Rd and Mill Rd	University of Evansville
00-02	15.7	15.5	15.7	00-02	40	38	39
01-03	15.2	15.2	15.5	01-03	39	38	40
02-04	14.5	14.7	14.7	02-04	37	36	37
03-05	14.9	15.0	15.1	03-05	35	34	34
04-06	14.5	14.6	14.8	04-06	34	32	32
05-07	14.7	14.9	15.0	05-07	36	33	33
06-08	13.4	13.7	13.6	06-08	30	28	29
07-09	12.9	13.1	13.1	07-09	29	27	28
08-10	12.8	12.6	12.8	08-10	27	28	27

Figure 10 - Annual Average PM_{2.5} Values from 2000 to 2010 for Three Evansville Sites

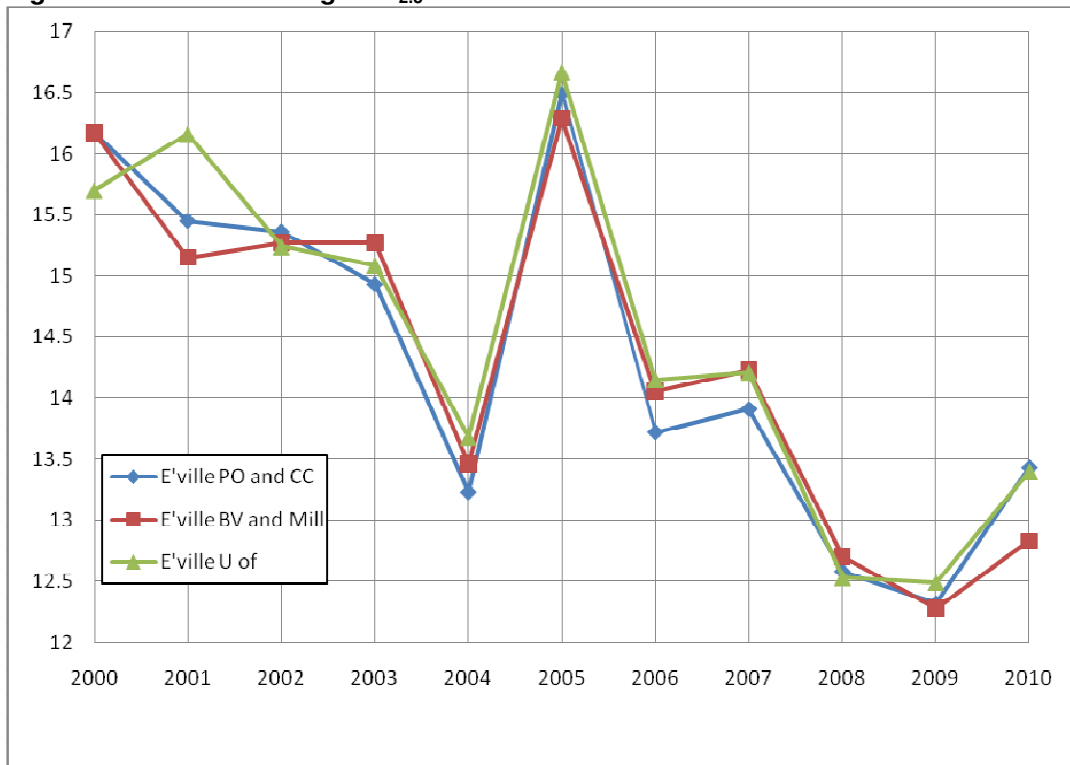


Figure 11 - 98th Percentile PM_{2.5} Values from 2000 to 2010 for Three Evansville Sites



The Oakland City (180510012) special purpose site will be discontinued at the end of 2011. A summary of the data from Oakland City, Evansville – Mill Rd & Buena Vista Rd combined site (181630012 & 181630021), Jasper–Post Office (180372001), Dale (181470009) and Southwest Ag Center (180830004) is in Table 15. Oakland City has consistently shown lower annual and daily design values against all other design values in the area.

Table 15 – Oakland City Data Comparison

Design Values											
Annual						Daily					
Year	Oakland City	E'ville Buena Vista and Mill Rd	Jasper Post Office	Dale	SWAG	Year	Oakland City	E'ville Buena Vista and Mill Rd	Jasper Post Office	Dale	SWAG
06-08	11.3	13.7	13.6	13.0	12.9	06-08	25	28	30	27	30
07-09	11.2	13.1	13.2	12.6	12.3	07-09	25	27	28	26	26
08-10	11.5	12.6	13.0	12.3	11.8	08-10	25	28	26	25	25

The Griffith (180890027) site will be discontinued at the end of 2011. Summaries of the data and design values from Griffith, Hammond – Purdue (180892004), Gary – Madison St. (180890031), East Chicago – Franklin (180890006) and Ogden Dunes (181270024) are in Tables 16 and 17. Griffith's annual design value has always been lower than the three closest sites of Hammond – Purdue, Gary – Madison St. and East Chicago – Franklin and has been comparable to the more closely related suburban site of Ogden Dunes. Griffith's daily design value has been lower than the three closest sites of Hammond – Purdue, Gary – Madison St. and East Chicago – Franklin and has been comparable to the Ogden Dunes site. Figures 12 and 13 show the trending of the annual average and 98th percentile values of the two closely related sites of Griffith and Ogden Dunes.

Table 16 – Griffith Data Comparison

Data											
Annual Average						98 th Percentile					
Year	Griffith	Hammond – Purdue	Gary – Madison St	East Chicago – Franklin	Ogden Dunes	Year	Griffith	Hammond – Purdue	Gary – Madison St	East Chicago – Franklin	Ogden Dunes
2000	14.04	14.96		15.76	14.55	2000	31.9	32.8		34.2	32.0
2001	15.18	15.38		16.11	14.18	2001	37.3	36.0		39.8	34.8
2002	14.60	14.70		14.92	14.2	2002	31.6	33.9		37.4	32.9
2003	14.10	14.55		14.60	12.94	2003	35.6	32.3		33.1	30.7
2004	12.82	13.26		13.18	12.38	2004	30.1	31.9		33.0	29.1
2005	15.46	15.40	16.61	15.76	14.59	2005	37.1	37.6	38.7	39.9	37.5
2006	12.29	12.67	13.30	13.18	11.81	2006	25.8	26.2	27.1	29.4	26.1
2007	13.17	13.80	14.55	14.44	13.79	2007	34.1	34.9	36.2	37.2	33.3
2008	11.69	11.66	12.27	11.95	10.89	2008	26.5	28.4	29.4	26.6	28.3
2009	11.00	15.85	12.12	11.34	11.29	2009	29.8	32.7	30.0	25.8	27.1
2010	12.39	12.30	12.90	12.48	11.56	2010	28.8	28.9	34.4	29.5	29.0

Table 17 – Griffith Design Value Comparison

Design Values											
Annual						Daily					
Year	Griffith	Hammond – Purdue	Gary – Madison St	East Chicago – Franklin	Ogden Dunes	Year	Griffith	Hammond – Purdue	Gary – Madison St	East Chicago – Franklin	Ogden Dunes
00-02	14.6	15.0		15.6	14.3	00-02	34	34		37	33
01-03	14.6	14.9		15.2	13.8	01-03	35	34		37	33
02-04	13.8	14.2		14.2	13.2	02-04	32	33		35	31
03-05	14.1	14.4	16.6	14.5	13.3	03-05	34	34	39	35	32
04-06	13.5	13.8	15.0	14.0	12.9	04-06	31	32	33	34	31
05-07	13.6	14.0	14.8	14.5	13.4	05-07	32	33	34	36	32
06-08	12.4	12.7	13.4	13.2	12.2	06-08	29	30	31	31	29
07-09	12.0	13.8	13.0	12.6	12.0	07-09	30	32	32	30	30
08-10	11.7	13.3	12.4	11.9	11.2	08-10	28	30	31	27	28

Figure 12 - Annual Average PM_{2.5} Values from 2000 to 2010 for Griffith and Ogden Dunes

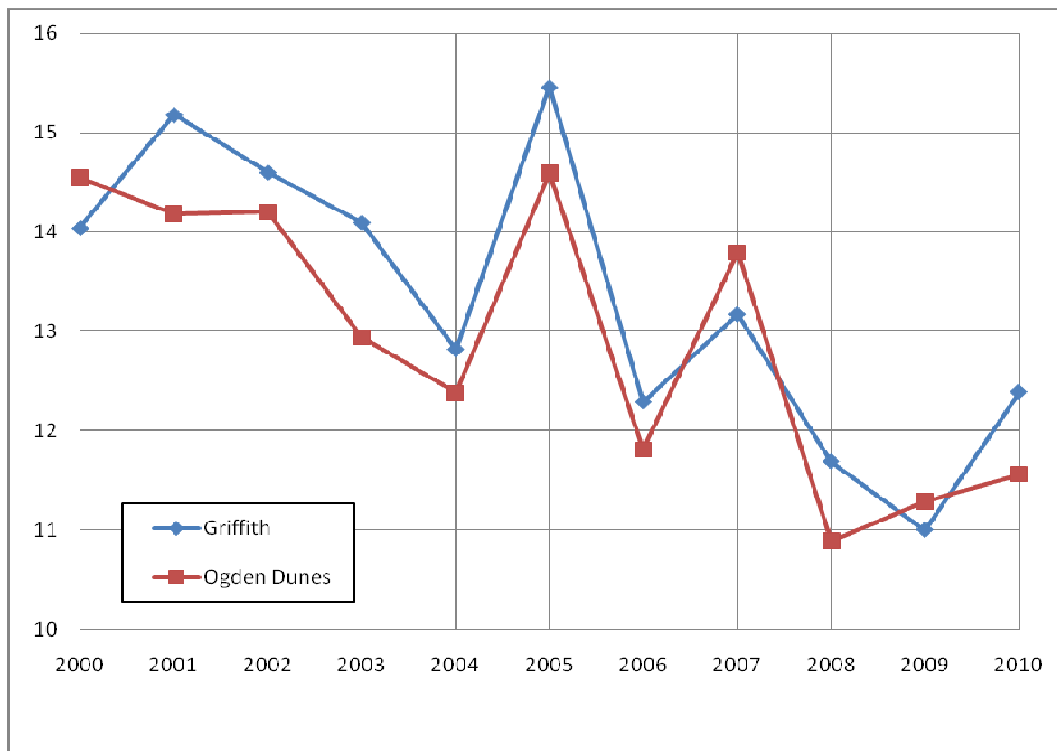
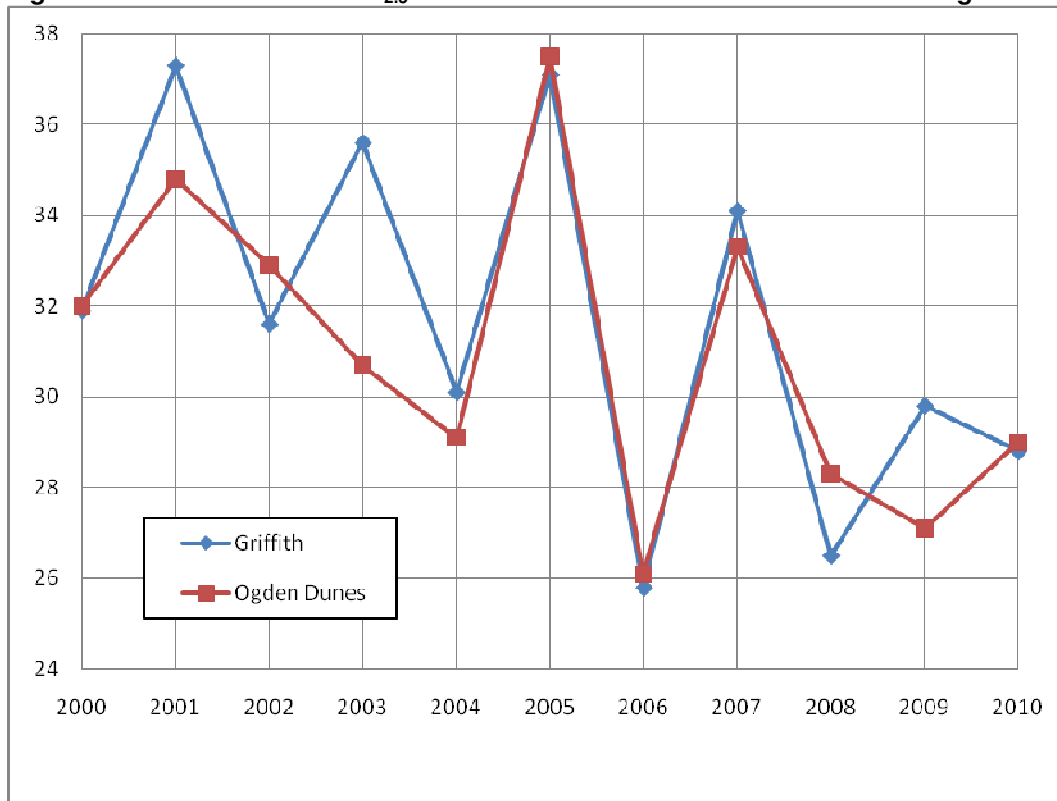


Figure 13 - 98th Percentile PM_{2.5} Values from 2000 to 2010 for Griffith and Ogden Dunes



The Columbus MSA is the only MSA in Indiana which does not have a PM_{2.5} monitoring site. Indiana will deploy a monitoring location in the city of Columbus to collect both intermittent and continuous data.

One of the recommendations which came from the 2010 Network Assessment was to relocate the State's background site from Southwest Ag Center near Vincennes in Knox County to the Plummer site located in Greene County. The values from the two locations should be very close and by having both parameters at the same site, it will result in a more efficient use of resources when performing field operations. Since a new shelter will be installed to accommodate the O₃, a continuous PM_{2.5} will also be installed to provide more mapping coverage across southwest Indiana.

As per 40CFR Part 58.12, if the daily design value of an area is within plus or minus 5% of the NAAQS, then sampling must be daily. Four (4) sites, listed in Table 18 operated on a daily sampling in 2011. Each year the data are evaluated to determine which sites must collect daily data. The design values from the 2008 - 2010 period will determine the sites to collect daily samples in 2012. Only Gary Burr St. will be dropped from collecting daily samples. Indpls – Washington Park and Indpls – W. 18th St. will continue sampling daily to continue to collect comparison data for the continuous monitors operating at these sites. Jeffersonville – Walnut St. will also collect daily samples to continue to collect more data for the Jeffersonville Special Study.

Table 18 – Daily Sampling Frequency

Site	Unrounded Design Value			Daily Sampling		
	06-08	07-09	08-10	2010	2011	2012
Jeffersonville - Walnut St	35.33	32.07	29.47	X	X	X
Indpls – Washington Park	31.97	30.23	28.37	X	X	X
Indpls – W. 18 th St.	34.13	31.57	29.87	X	X	X
Gary - Burr St	32.6	33.73	32.63		X	
+/-5% of NAAQS = 33.25ug/m ³ to 36.75ug/m ³				X - Required Site X - Other Daily Site		
2010 sampling determined by 06-08 design value 2011 sampling determined by 07-09 design value 2012 sampling determined by 08-10 design value						

Unanticipated Network Changes

Since Indiana has not opted to spatially average PM_{2.5} values from multiple sites in an MSA, if access to a site is lost or the site must be discontinued, and that site is violating the NAAQS for PM_{2.5}, a new site need not be found, if the 'design value site' for the MSA is still operational. The attainment of the area would still be determined by the 'design value site'. However, if the violating 'design value site' were to be lost, every effort would be made to obtain a new site close to the old site and having the same scale of representativeness and monitoring objectives as the original site.

Figure 14 – PM_{2.5} Monitoring Network

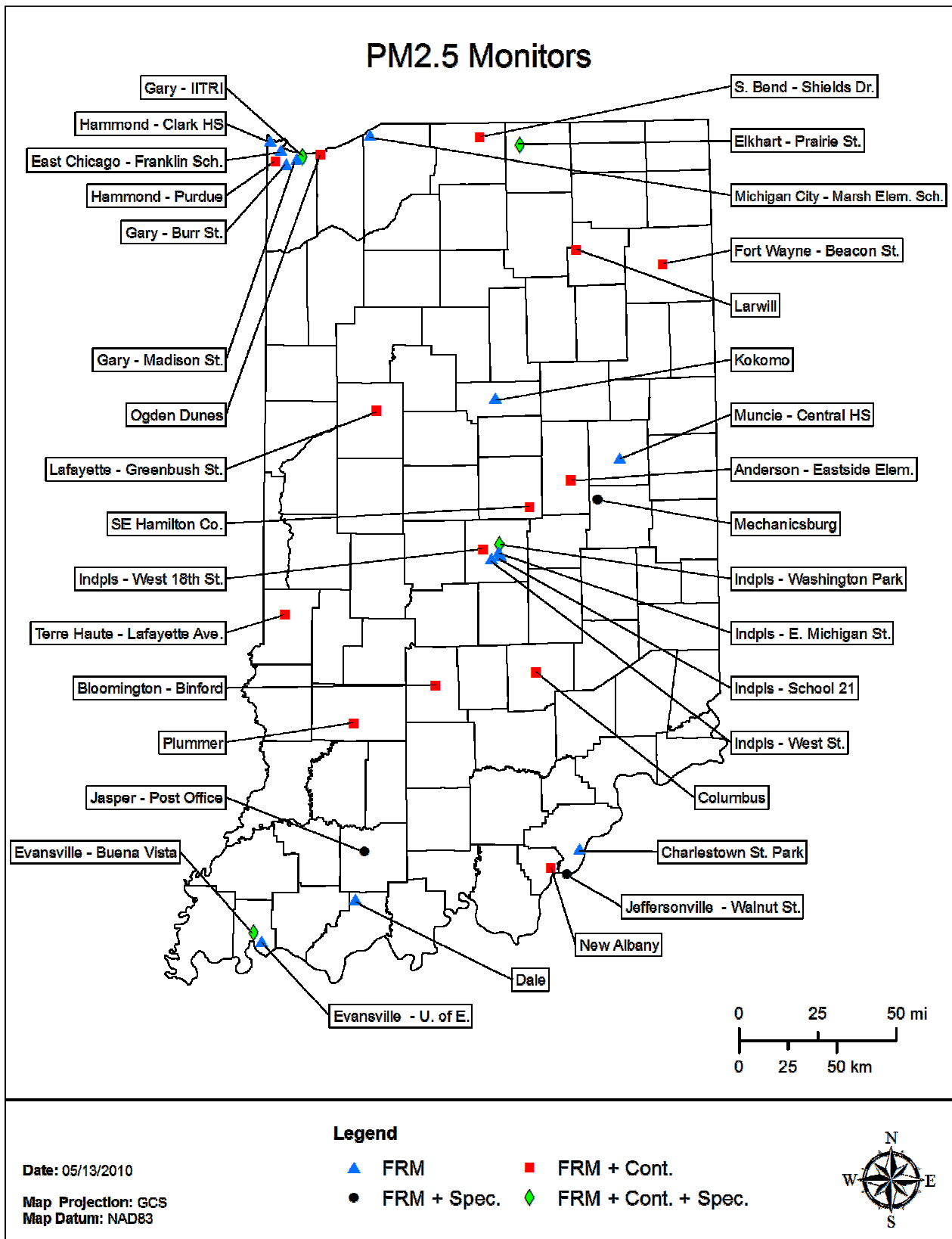


Table 19 – PM_{2.5} Monitoring Network

PM _{2.5} Monitoring Network																
RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management																
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	NAAQS Comparable	MSA	Site Change Proposed?	
180030004	Ft Wayne - Beacon St.	Allen	Fort Wayne	2022 North Beacon St.	SLAMS	01/01/99	3-Day	145	Neigh	Pop Exp	41.094722	-85.101944	Yes	Ft. Wayne	No	
180030004	Ft Wayne - Beacon St.	Allen	Fort Wayne	2022 North Beacon St.	Special Purpose	01/01/02	Continuous	181	Neigh	Pop Exp	41.094722	-85.101944	No	Ft. Wayne	No	
18005____	Columbus	Bartholomew			SLAMS	2012	3-Day		Neigh	Pop Exp			Yes	Columbus	Add	
18005____	Columbus	Bartholomew			Special Purpose	2012	Continuous		Neigh	Pop Exp			No	Columbus	Add	
180190006	Jeffersonville - Walnut St.	Clark	Jeffersonville	Jeffersonville PFAU, 719 Walnut St.	SLAMS	06/26/03	1-Day	145	Neigh	Pop Exp	38.277675	-85.740153	Yes	Louisville/Jefferson Co.	No	
180190008	Charlestown State Park	Clark		Charlestown State Park 12500 Hwy 62, Charlestown	Special Purpose	07/01/08	3-Day	145	Urban	Pop Exp	38.393833	-85.664167	Yes	Louisville/Jefferson Co.	No	
180350006	Muncie - Central HS	Delaware	Muncie	Muncie Central HS, 801N. Walnut St.	SLAMS	10/15/99	3-Day	145	Neigh	Pop Exp	40.201111	-85.388056	Yes	Muncie	No	
180372001	Jasper - Post Office	Dubois	Jasper	Post Office, 206 E. 6th St.	SLAMS	01/01/00	3-Day	145	Neigh	Pop Exp	38.391389	-86.929167	Yes	Non-MSA County	No	
180390008	Elkhart - Prairie St.	Elkhart	Elkhart	2745 Prairie St.	SLAMS	01/01/08	3-Day	145	Neigh	Pop Exp	41.656905	-85.968371	Yes	Elkhart-Goshen	No	
180390008	Elkhart - Prairie St.	Elkhart	Elkhart	2745 Prairie St.	Special Purpose	11/23/10	Continuous	170	Neigh	Pop Exp	41.656905	-85.968371	No	Elkhart-Goshen	No	
180431004	New Albany	Floyd	New Albany	Green Valley Elem. Sch., 2230 Green Valley Rd.	SLAMS	01/18/99	3-Day	145	Neigh	Pop Exp	38.308056	-85.834167	Yes	Louisville/Jefferson Co.	No	
180431004	New Albany	Floyd	New Albany	Green Valley Elem. Sch., 2230 Green Valley Rd.	QA Collocated	01/18/99	6-Day	145	Neigh	Quality Assurance	38.308056	-85.834167	No	Louisville/Jefferson Co.	No	
180431004	New Albany	Floyd	New Albany	Green Valley Elem. Sch., 2230 Green Valley Rd.	Special Purpose	11/01/03	Continuous	181	Neigh	Pop Exp	38.308056	-87.834167	No	Louisville/Jefferson Co.	No	
180510012	Oakland City	Gibson		2205 S. 1350 E., Oakland City	Special Purpose	01/18/08	3-Day	145	Urban	Pop Exp	38.322930	-87.318789	Yes	Evansville, IN-KY	Discontinue	
180550001	Plummer	Greene		2500 S. 275 W	SLAMS	2012	3-Day	145	Regional	Upwind Bkgrd	38.985578	-86.990120	Yes	Bloomington	Add	
180550001	Plummer	Greene		2500 S. 275 W	Special Purpose	07/04/05	Continuous		Regional	Upwind Bkgrd	38.985578	-86.990120	No	Bloomington	Add	
18057____		Hamilton			SLAMS	2011	3-Day	145	Urban	Pop Exp			Yes	Indianapolis-Carmel	No	
18057____		Hamilton			Special Purpose	2011	Continuous		Urban	Pop Exp			No	Indianapolis-Carmel	No	
180650003	Mechanicsburg	Henry		Shenandoah HS, 7354 W. Hwy. 36, Pendleton	SLAMS	09/26/00	3-Day	145	Regional	Regional Transport	40.011667	-85.523611	Yes	Non-MSA County	No	
180670003	Kokomo	Howard	Kokomo	Fire Station, 215 W. Superior	SLAMS	06/11/99	3-Day	145	Neigh	Pop Exp	40.485556	-86.132778	Yes	Kokomo	No	
180830004	Southwest Ag Center	Knox		SW Purdue Ag Center, Vincennes	SLAMS	01/01/00	3-Day	145	Regional	General Background	38.740833	-87.484722	Yes	Non-MSA County	Discontinue	
180890006	East Chicago - Franklin Sch.	Lake	East Chicago	Franklin School, Alder & 142nd St.	SLAMS	01/27/99	3-Day	145	Neigh	Pop Exp	41.636111	-87.440833	Yes	Chicago-Naperville-Joliet, IL	No	

Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	NAAQS Comparable	MSA	Site Change Proposed?
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	03/04/99	3-Day	145	Middle	Source & Pop Exp	41606667	-87.304722	Yes**	Chicago-Naperville-Joliet, IL	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	Special Purpose	01/01/03	Continuous	184	Middle	Source & Pop Exp	41606667	-87.304722	No	Chicago-Naperville-Joliet, IL	No
180890026	Gary - Burr St	Lake	Gary	Truck Stop, 25th Ave & Burr St.	SLAMS	02/12/00	1-Day	145	Middle	Source & Pop Exp	41573056	-87.405833	Yes**	Chicago-Naperville-Joliet, IL	Op Sched
180890027	Griffith	Lake	Griffith	Eldon Ready Elem Sch, 1345 N. Broad St.	SLAMS	02/18/00	3-Day	145	Neigh	Pop Exp	41546667	-87.426389	Yes	Chicago-Naperville-Joliet, IL	Discontinue
180890031	Gary - Madison St.	Lake	Gary	Indiana American Water Co., 650 Madison St.	SLAMS	07/01/05	3-Day	145	Neigh	Pop Exp	41598505	-87.342991	Yes	Chicago-Naperville-Joliet, IL	No
180890031	Gary - Madison St.	Lake	Gary	Indiana American Water Co., 650 Madison St.	QA Collocated	07/01/05	6-Day	145	Neigh	Quality Assurance	41598505	-87.342991	No	Chicago-Naperville-Joliet, IL	No
180892004	Hammond - Purdue	Lake	Hammond	Powers Bldg. Purdue Univ. Calumet, 2200 169th St.	SLAMS	02/11/99	3-Day	145	Neigh	Pop Exp	41585278	-87.474444	Yes	Chicago-Naperville-Joliet, IL	No
180892004	Hammond - Purdue	Lake	Hammond	Powers Bldg. Purdue Univ. Calumet, 2200 169th St.	Special Purpose	12/01/03	Continuous	184	Neigh	Pop Exp	41585278	-87.474444	No	Chicago-Naperville-Joliet, IL	No
180892010	Hammond - Clark HS	Lake	Hammond	Robertsdale Clark HS, 1921 Davis St.	SLAMS	01/27/99	3-Day	145	Middle	Pop Exp	41678333	-87.508333	Yes	Chicago-Naperville-Joliet, IL	No
180910011	Michigan City - Marsh Elem. Sch.	La Porte	Michigan City	Marsh Elem. Sch., 400 E. Homer St.	SLAMS	12/17/99	3-Day	145	Neigh	Pop Exp	41706944	-86.891111	Yes	Michigan City-LaPorte	No
180950011	Anderson - Eastside Elem.	Madison	Anderson	Eastside Elementary Sch., 844 N. Scatterfield Rd.	SLAMS	07/22/10	3-Day	145	Middle	Pop Exp	40.125556	-85.652222	Yes	Anderson	No
180950011	Anderson - Eastside Elem.	Madison	Anderson	Eastside Elementary Sch., 844 N. Scatterfield Rd.	Special Purpose	07/08/10	Continuous	184	Middle	Pop Exp	40.125556	-85.652222	No	Anderson	No
180970043	Indpls - West St.	Marion	Indianapolis	1735 South West Street	SLAMS	01/24/99	3-Day	145	Middle	Pop Exp	39.744957	-86.166496	Yes**	Indianapolis-Carmel	Op Sched
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS	03/07/99	1-Day	145	Neigh	Pop Exp	39.811097	-86.114469	Yes	Indianapolis-Carmel	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	Special Purpose	01/01/04	Continuous	181	Neigh	Pop Exp	39.811097	-86.114469	No	Indianapolis-Carmel	No
180970081	Indpls - W. 18th St.	Marion	Indianapolis	Ernie Pyle Sch 90, 3351W. 18th St.	SLAMS	01/22/99	3-Day	145	Neigh	Pop Exp	39.788903	-86.214628	Yes	Indianapolis-Carmel	No
180970081	Indpls - W. 18th St.	Marion	Indianapolis	Ernie Pyle Sch 90, 3351W. 18th St.	QA Collocated	02/11/99	6-Day	145	Neigh	Quality Assurance	39.788903	-86.214628	No	Indianapolis-Carmel	No
180970081	Indpls - W. 18th St.	Marion	Indianapolis	Ernie Pyle Sch 90, 3351W. 18th St.	Special Purpose	11/01/07	Continuous	181	Neigh	Pop Exp	39.788903	-86.214628	No	Indianapolis-Carmel	No
180970083	Indpls - E. Michigan St.	Marion	Indianapolis	Thomas Gregg Sch 15, 2302 E. Michigan St.	SLAMS	01/22/99	3-Day	145	Neigh	Pop Exp	39.774944	-86.122053	Yes	Indianapolis-Carmel	No
180970084	Indpls - School 21	Marion	Indianapolis	IPS Sch 21, 2815 English Ave.	SLAMS	02/16/09	3-Day	145	Middle	Pop Exp	39.759083	-86.115556	Yes**	Indianapolis-Carmel	No
181050063	Bloomington	Monroe	Bloomington	Binford Elementary Sch, 2300 E. 2nd St.	SLAMS	04/01/09	3-Day	145	Neigh	Pop Exp	39.159444	-86.504722	Yes	Bloomington	No
181050063	Bloomington	Monroe	Bloomington	Binford Elementary Sch, 2300 E. 2nd St.	Special Purpose	04/01/09	Continuous	184	Neigh	Pop Exp	39.159444	-86.504722	No	Bloomington	No
181270024	Ogden Dunes	Porter	Ogden Dunes	Water Treatment Plant, 84 Diana Rd	SLAMS	01/27/99	3-Day	145	Neigh	Pop Exp	41617500	-87.199167	Yes	Chicago-Naperville-Joliet, IL	No
181270024	Ogden Dunes	Porter	Ogden Dunes	Water Treatment Plant, 84 Diana Rd	Special Purpose	12/03/03	Continuous	181	Neigh	Pop Exp	41617500	-87.199167	No	Chicago-Naperville-Joliet, IL	No

Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	NAAQS Comparable	MSA	Site Change Proposed?
181410015	South Bend - Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	SLAMS	06/01/06	3-Day	145	Neigh	Pop Exp	41.696692	-86.214683	Yes	South Bend-Mishawaka	No
181410015	South Bend - Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	QA Collocated	06/01/06	6-Day	145	Neigh	Quality Assurance	41.696692	-86.214683	No	South Bend-Mishawaka	No
181410015	South Bend - Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	Special Purpose	06/01/06	Continuous	170	Neigh	Pop Exp	41.696692	-86.214683	No	South Bend-Mishawaka	No
181470009	Dale	Spencer	Dale	David Turnham School, Dunn & Locust	SLAMS	02/01/00	3-Day	145	Urban	Regional Trans	38.167500	-86.983333	Yes	Non-MSA County	No
181570008	Lafayette - Greenbush St.	Tippecanoe	Lafayette	Cinergy Substation, 3401 Greenbush St	SLAMS	10/01/02	3-Day	145	Neigh	Pop Exp	40.431639	-86.852500	Yes	Lafayette	No
181570008	Lafayette - Greenbush St.	Tippecanoe	Lafayette	Cinergy Substation, 3401 Greenbush St	QA Collocated	10/01/02	6-Day	145	Neigh	Quality Assurance	40.431639	-86.852500	No	Lafayette	No
181570008	Lafayette - Greenbush St.	Tippecanoe	Lafayette	Cinergy Substation, 3401 Greenbush St	Special Purpose	04/01/05	Continuous	170	Neigh	Pop Exp	40.431639	-86.852500	No	Lafayette	No
181630016	Evansville - U of E	Vanderburgh	Evansville	Carson Center, Walnut St.	SLAMS	06/05/99	3-Day	145	Neigh	Pop Exp	37.974444	-87.532222	Yes	Evansville, IN-KY	No
181630020	Evansville - Post Office	Vanderburgh	Evansville	800 Sycamore St	SLAMS	03/11/09	3-Day	145	Neigh	Pop Exp	37.975278	-87.567778	Yes	Evansville, IN-KY	Discontinue
181630020	Evansville - Post Office	Vanderburgh	Evansville	800 Sycamore St	QA Collocated	03/11/09	6-Day	145	Neigh	Quality Assurance	37.975278	-87.567778	No	Evansville, IN-KY	Relocate
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS	07/10/09	3-Day	145	Neigh	Pop Exp	38.013333	-87.577778	Yes	Evansville, IN-KY	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	QA Collocated	04/03/11	6-Day	145	Neigh	Quality Assurance	38.013333	-87.577778	No	Evansville, IN-KY	Relocation
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS	07/14/09	Continuous	170	Neigh	Pop Exp	38.013333	-87.577778	No	Evansville, IN-KY	No
181670018	Terre Haute - Lafayette Ave.	Vigo	Terre Haute	961 N. Lafayette Ave.	SLAMS	03/19/99	3-Day	145	Neigh	Pop Exp	39.486111	-87.401389	Yes	Terre Haute	No
181670018	Terre Haute - Lafayette Ave.	Vigo	Terre Haute	961 N. Lafayette Ave.	Special Purpose	07/02/03	Continuous	170	Neigh	Pop Exp	39.486111	-87.401389	No	Terre Haute	No
181830003	Larwill	Whitley	Larwill	Whitko Middle School, 710 N. State Rd. 5	SLAMS	04/08/10	3-Day	145	Regional	Regional Transport	41.169646	-171.258585	Yes	Ft. Wayne	No
181830003	Larwill	Whitley	Larwill	Whitko Middle School, 710 N. State Rd. 5	Special Purpose	04/08/10	Continuous	170	Regional	Regional Transport	41.169646	-85.629292	No	Ft. Wayne	No
** According to 40 CFR Part 58 Subpart D, PM2.5 data that is representative of a unique population-oriented scale or localized hot spot are only eligible for comparison to the 24-hour PM2.5 NAAQS. The annual standard does not apply.															
<div> <div>MONITORING METHODS:</div> <div> 145 - R & P 2025 184 - Thermo SHARP </div> <div> 170 - MET ONE BAM - FEM 181 - FDMS TEOM </div> </div>															

Sulfur Dioxide (SO₂)

Monitoring Requirements

40 CFR Part 58 Appendix D, 4.4 details the requirements for SO₂ monitoring. U.S.EPA has revised the primary NAAQS. The new standard is based on the 3-year average of the 99th percentile of the yearly distribution of 1-hour daily maximum SO₂ concentrations. The level of the new 1-hour standard is 75 ppb. The monitoring requirements have also been revised. U.S.EPA is setting specific minimum requirements as to location and number of SO₂ monitors. Monitoring is required in CBSAs based on a population weighted emissions index (PWEI) for the area. Any adjustments to the existing monitoring network to ensure that monitoring meets the network design regulations for the new 1-hour SO₂ standard must be sited and operational by January 1, 2013. See Appendix C “2012 Indiana SO₂ Monitoring Network Plan” for more detailed information.

The appropriate spatial scales for SO₂ SLAMS monitoring are the microscale, middle, neighborhood, and urban scales. Monitors sited at the microscale, middle, and neighborhood scales are suitable for determining maximum hourly concentrations. Monitors sited at urban scales are useful for identifying SO₂ transport, trends, and background concentrations if sited upwind of a source.

40 CFR Part 58.10 (a)(3) requires NCore monitoring. 40 CFR Part 58 Appendix D, 3(b) states that SO₂ measurements will be included at the NCore multi-pollutant monitoring sites. Multi-point NCore monitoring sites provide data for metropolitan area trends analyses, a general control strategy, and progress tracking.

Monitoring Methodology

Indiana’s SO₂ monitoring network collects data with Thermo Environmental Models 43c, 43i and the API Model 100E using pulsed ultra-violet fluorescence monitoring methodology. The API Model 100EU Trace level/Ultra-sensitive analyzer is used to collect trace level SO₂ data at the NCore, Indpls - Washington Park site.

Monitoring Network

Indiana operates eight (8) SO₂ monitors located throughout the state, as displayed in Figure 15. The current network, along with any changes planned in 2012, is listed in Table 20.

Network Modifications

No changes are planned for the Indiana SO₂ monitoring network in 2012.

Figure 15 – SO₂ Monitoring Network

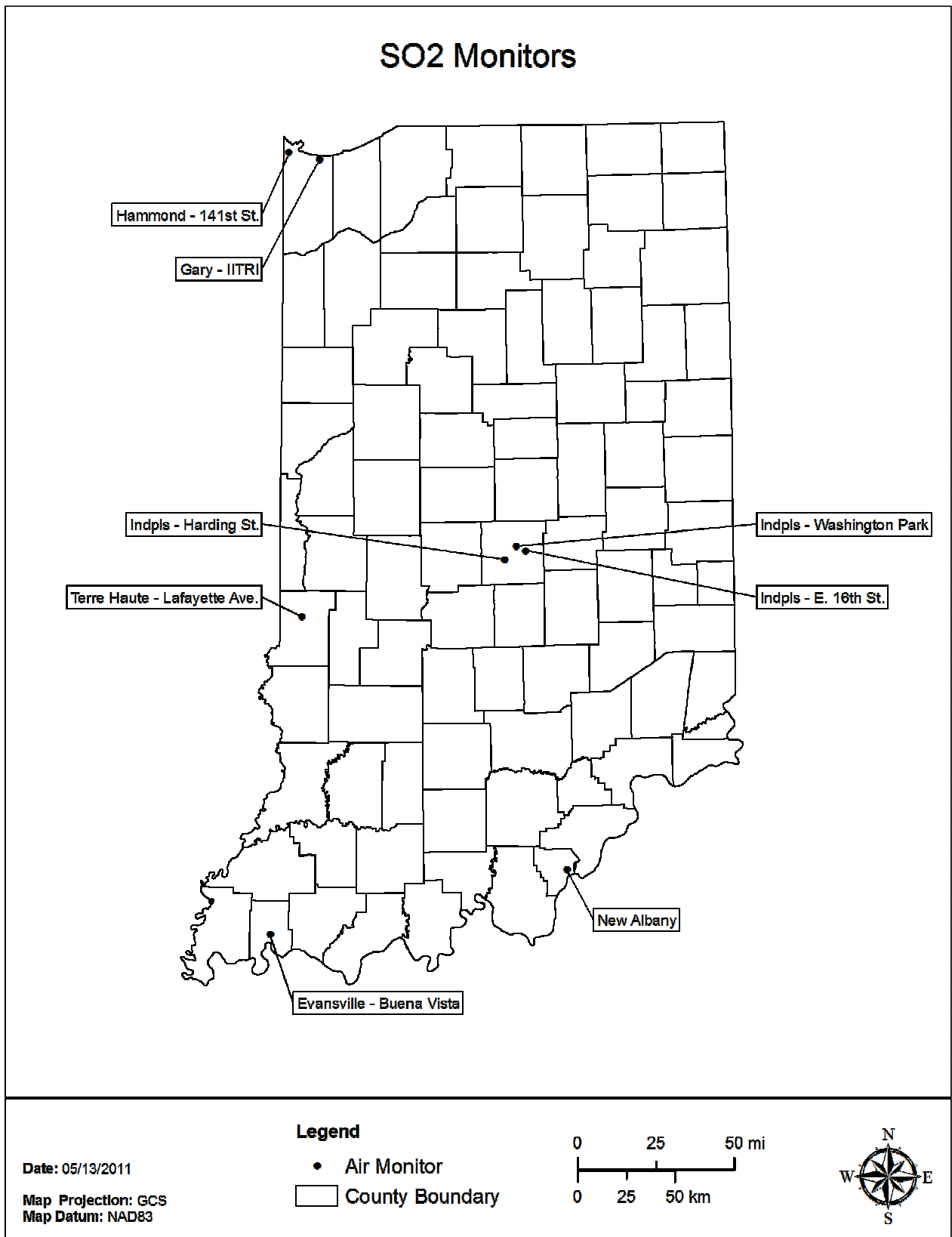


Table 20 – SO₂ Monitoring Network

Parameter Code: 42401					SO ₂ - Sulfur Dioxide									
RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management														
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
180431004	New Albany	Floyd	New Albany	Green Valley Elem. Sch., 2230 Green Valley Rd.	SLAMS	11/01/76	Continuous	060	Neigh	Pop Exp	38.308056	-85.834167	Louisville/Jefferson Co.	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	06/12/97	Continuous	060	Neigh	Pop Exp	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	No
180892008	Hammond - 141st St.	Lake	Hammond	1300 E. 141st Street	SLAMS	08/01/75	Continuous	060	Neigh	Highest Conc	41.639444	-87.493611	Chicago-Naperville-Joliet, IL	No
180970057	Indpls - Harding St.	Marion	Indianapolis	1321 Harding St.	SLAMS	03/04/82	Continuous	060	Neigh	Highest Conc	39.749019	-86.186314	Indianapolis-Carmel	No
180970073	Indpls - E. 16th St.	Marion	Indianapolis	6125 E. 16th St.	SLAMS	04/02/90	Continuous	060	Neigh	Pop Exp	39.789167	-86.060833	Indianapolis-Carmel	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	NCORE	01/01/10	Continuous	100	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	SLAMS	07/08/09	Continuous	060	Neigh	Pop Exp	38.013333	-87.577778	Evansville, IN-KY	No
181670018	Terre Haute - Lafayette Ave.	Vigo	Terre Haute	961 N. Lafayette Ave.	SLAMS	07/01/83	Continuous	060	Neigh	Pop Exp	39.486111	-87.401389	Terre Haute	No
SO2 MONITORING METHOD: 060 - THERMO ELECTRON 43C, 43i 100 - TELEDYNE INSTR. 100EU														

PM_{2.5} Speciation

Monitoring Requirements

Monitoring requirements in 40 CFR Part 58 Appendix D 4.7.4 states that “each state shall continue to conduct chemical speciation monitoring and analyses at sites designated to be part of the PM_{2.5} Speciation Trends Network (STN).”

Monitoring Methodology

Intermittent speciation samples are collected on three different filter mediums, each for a specific analysis and list of compounds. A Teflon filter using the Energy Dispersive X-ray Fluorescence analysis methodology is used to target the mass and thirty-three (33) trace metals. A nylon filter using Ion Chromatography for an analytical method is used to target sulfates, nitrates, and three (3) cations; ammonium, potassium, and sodium. And a quartz fiber filter using Thermal Optical Analysis is used to target organic, elemental, and total carbon.

The Met One SASS is used to collect Mass-PM_{2.5}, trace elements, Cations-PM_{2.5}, Nitrate-PM_{2.5}, and Sulfate-PM_{2.5} data. The URG-3000N sampler is used to collect organic and elemental carbon data. Samples are collected on a 1/6 day sampling frequency at all sites except Indpls - Washington Park, which samples every third day.

Indiana also operates continuous speciation monitors at three (3) different locations. A Magee Model AE21 Aethalometer, using optical absorption analysis methodology, is used for sampling black carbon at Indpls - Washington Park and Gary - IITRI, and a Magee Model AE22, using optical absorption analysis methodology, is used for sampling black carbon at Evansville - Buena Vista. A Thermo Electron Model 5020 Sulfate Particulate Analyzer, using Catalytic Thermal Reduction and Pulsed Fluorescence analysis, monitors sulfates at Indpls - Washington Park and Evansville - Buena Vista.

Monitoring Network

The Indiana speciation network consists of seven (7) sites across the state. The current network, along with any changes planned for 2012, is listed in Table 21.

Network Modifications

The Met One SASS and URG-3000N samplers located at the Hammond-Purdue site (180892004) are to be discontinued as of September 30, 2011. LADCO has determined that the Hammond-Purdue site and Chicago-Lawndale site are redundant; collecting data that are very similar. The Indiana site and Illinois site are located 16 miles apart, and have a PM_{2.5} Correlation Factor of 0.92, based on 2006-2008 PM_{2.5} mass concentrations.

A Magee Aethalometer is to be installed at the Elkhart-Prairie Street site (180390008) by October 1, 2011. Current data collected from the URG-3000N sampler shows intermittent high values of carbon. A continuous PM_{2.5} sampler is also located at this site. The continuous carbon data collected from the Aethalometer should show some correlations of high carbon to high PM_{2.5} mass.

Figure 16 – Speciation Monitoring Network

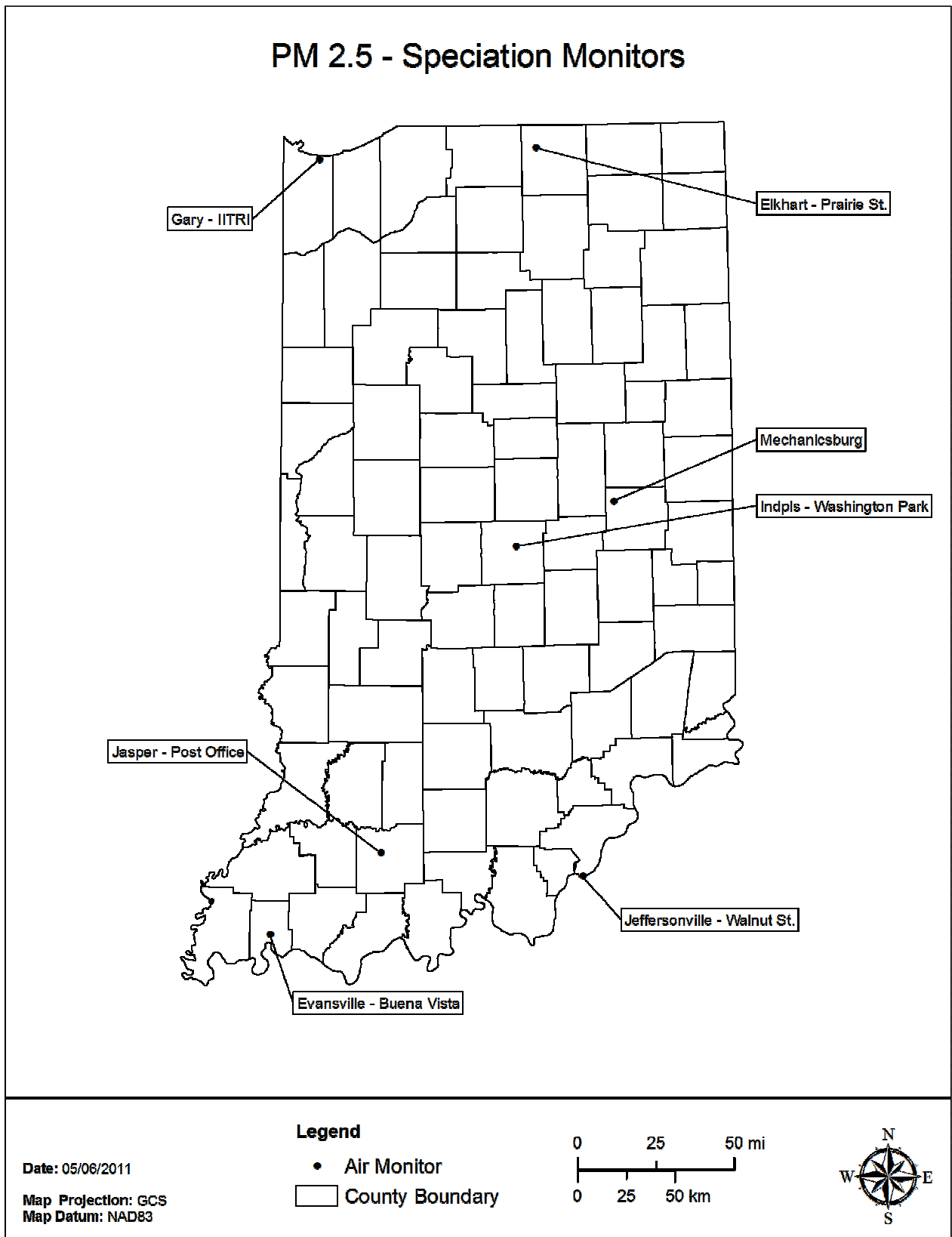


Table 21 – PM_{2.5} Speciation Monitoring Network

PM2.5 Speciation (Sulfate, Nitrate, Carbon, etc.)														
RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management														
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
180190006	Jeffersonville-Walnut St.	Clark	Jeffersonville	Jeffersonville PFAU, 719 Walnut St.	Suplmntl Speciation	07/01/08	6-Day	811, 812, 833	Neigh	Pop Exp	38.277675	-85.740153	Louisville/Jefferson Co.	No
180372001	Jasper - Post Office	Dubois	Jasper	Post Office, 206 E. 6th St	Suplmntl Speciation	01/04/05	6-Day	811, 812, 833	Neigh	Pop Exp	38.391389	-86.929167	Non-MSA County	No
180390008	Elkhart - Prairie St.	Elkhart	Elkhart	2745 Prairie St.	Suplmntl Speciation	01/01/08	6-Day	811, 812, 833	Neigh	Pop Exp	41.656905	-85.968371	Elkhart-Goshen	No
180390008	Elkhart - Prairie St.	Elkhart	Elkhart	2745 Prairie St.	Special Purpose	10/01/11	Continuous Black Carbon	866	Neigh	Pop Exp	41.656905	-85.968371	Elkhart-Goshen	Add
180650003	Mechanicsburg	Henry		Shenandoah HS, 7354 W. Hwy. 36	Suplmntl Speciation	02/01/02	6-Day	811, 812, 833	Regional	Regional Trans	40.011667	-85.523611	Non-MSA County	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	Suplmntl Speciation	04/03/03	6-Day	811, 812, 833	Middle	Pop Exp	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	Special Purpose	04/01/05	Continuous Black Carbon	866	Middle	Pop Exp	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	No
180892004	Hammond - Purdue	Lake	Hammond	Powers Bldg. Purdue Univ. Calumet, 2200 169th St.	Suplmntl Speciation	01/01/04	6-Day	811, 812, 833	Neigh	Pop Exp	41.585278	-87.474444	Chicago-Naperville-Joliet, IL	Discontinue
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	Trends Speciation	12/13/00	3-Day	811, 812, 833	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	Special Purpose	10/01/03	Continuous Black Carbon	866	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	Special Purpose	01/01/06	Continuous Sulfate	875	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	Suplmntl Speciation	07/12/09	6-Day	811, 812, 833	Neigh	Pop Exp	38.013333	-87.577778	Evansville, IN-KY	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	Special Purpose	07/08/09	Continuous Black Carbon	867	Neigh	Pop Exp	38.013333	-87.577778	Evansville, IN-KY	No
181630021	Evansville - Buena Vista	Vanderburgh	Evansville	1110 W. Buena Vista Rd	Special Purpose	07/08/09	Continuous Sulfate	875	Neigh	Pop Exp	38.013333	-87.577778	Evansville, IN-KY	No
MONITORING METHOD: 811 - MET ONE SASS TEFLON / ANALYSIS METHOD: ENERGY DISPERSIVE XRF 812 - MET ONE SASS NYLON / ANALYSIS METHOD: ION CHROMATOGRAPHY 833 - URG MASS450 QUARTZ WINS / ANALYSIS METHOD: STN TOT 866 - MAGEE AETHALOMETER AE21 / ANALYSIS METHOD: OPTICAL ABSORPTION 867 - MAGEE AETHALOMETER AE22 / ANALYSIS METHOD: OPTICAL ABSORPTION 875 - THERMO ELECTRON 5020 / CATALYTIC THERMAL REDUCT, PULSED FLUORESCENCE														

PAMS Ozone Precursors (VOCs)

Monitoring Requirements

Ozone precursor monitoring is required as part of the PAMS program. The specific requirements are addressed in Table D-6 of 40 CFR Part 58 Appendix D. According to the Modified Network Plan for the Chicago Nonattainment Area, Indiana operates one (1) type 2 PAMS site. A type 2 site requires measurements for speciated VOCs, carbonyls, NO_x, CO, O₃, and surface met.

This section deals with the speciated VOCs. The other parameters are addressed in their own area. According to the plan, fifty-six (56) speciated VOCs are to be collected at Indiana's PAMS site.

Monitoring Methodology

Ozone precursor VOCs are collected continuously in June, July, and August using a Perkin Elmer Clarus 500 Gas Chromatograph (GC), with dual Flame Ionization Detectors (FIDs) and a TurboMatrix thermal desorber. In addition, canister samples are collected year round on a 1/6 day sampling schedule. These canisters are analyzed using the same analytical method.

Monitoring Network

Indiana operates two (2) PAMS monitoring sites collecting ozone precursors VOCs at Gary—IITRI (180890022), and Indpls-Washington Park (180970078). The site details are in Table 22.

Network Modifications

The equipment that had been operational at Indpls-School 21 to monitor the cleanup at Citizen's Gas and Coke facility has been moved to Indpls-Washington Park. The site is to be operational June 1, 2011. No changes are planned for ozone precursor VOC monitoring in 2012.

Figure 17 – Ozone Precursors Network

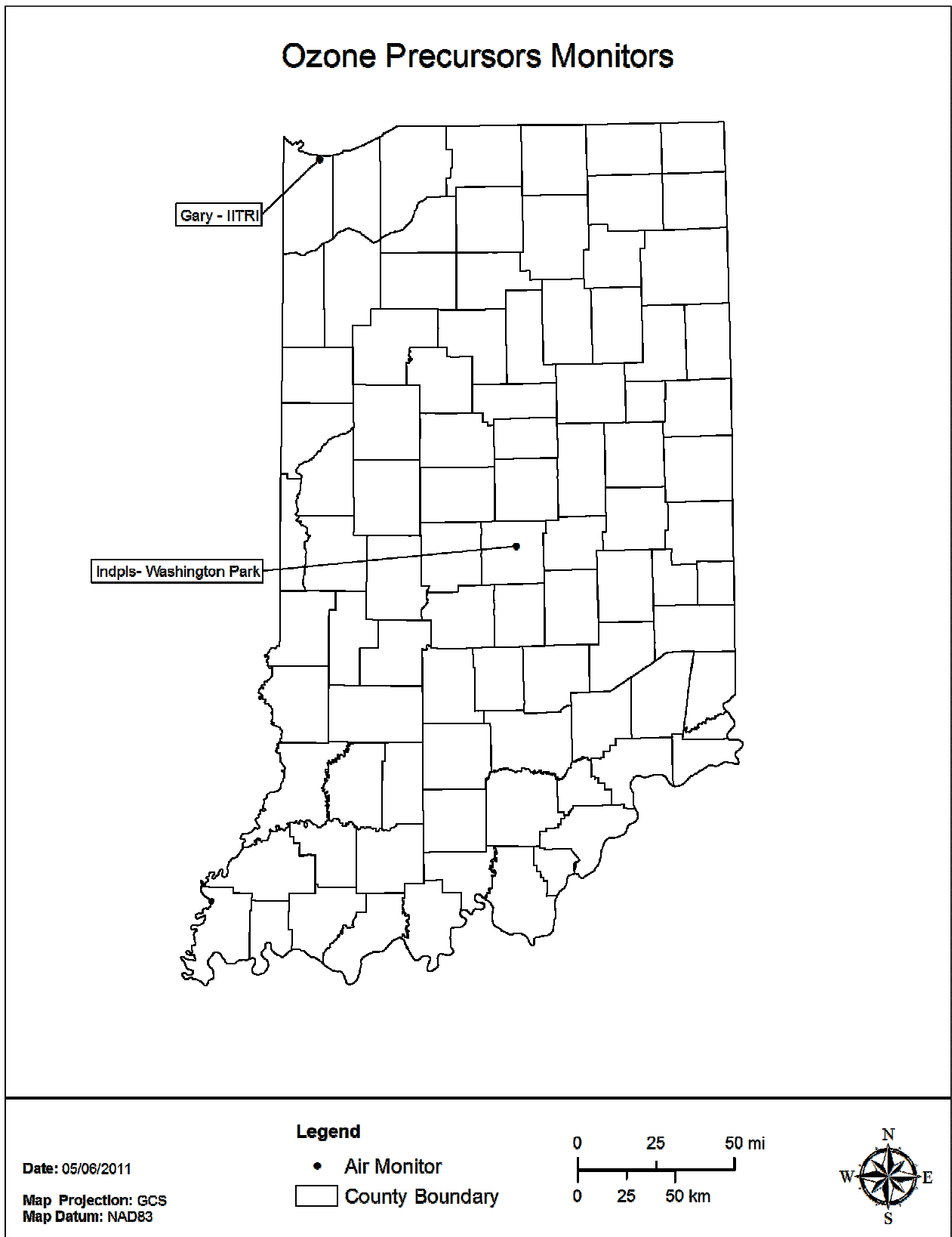


Table 22 – Ozone Precursor Monitoring Network

Ozone Precursors														
RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management														
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	Unofficial PAMS	07/06/95	Continuous*	128	Middle	Max Prec. Em. Impact	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	Unofficial PAMS	07/06/95	6-Day	146	Middle	Max Prec. Em. Impact	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	Special Purpose	07/01/11	Continuous*	128	Middle	Max Prec. Em. Impact	39.811097	-86.114469	Indianapolis-Carmel	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	Special Purpose	07/01/11	6-Day	146	Middle	Max Prec. Em. Impact	39.811097	-86.114469	Indianapolis-Carmel	No
							* Data collected June, July, & August only							
MONITORING METHOD: 128 - CRYOGENIC PRECONCENTRATION GC/FID DETECTION 146 - E.S.A. AC32M / CHEMILUMINESCENT														

Toxics (VOCs)

Monitoring Requirements

There are no requirements for toxics monitoring listed in 40 CFR Part 58.

Monitoring Methodology

Indiana uses a modification of the TO-15 method at the majority of its sites to collect toxics VOC data. TO-15 is part of U.S.EPA's Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air and consists of guidance for the sampling and analysis of volatile organic compounds in air. Ambient air is collected in a stainless steel canister in the field using either the Meriter MCS-1-R or the ATEC 2200 Air Toxic Samplers and analyzed using a GC/MS to determine the concentration of the compounds found in the sample obtained. Samples are collected for 24 hours on a 1/6 sampling schedule. Sixty-two (62) different VOCs are currently analyzed.

Monitoring Network

In 2012, Indiana will operate nine (9) sites. The current network, along with any changes planned in 2012, is listed in Table 23.

Network Modifications

East Chicago-Aldis St. (180890023) will be relocated. The East Chicago water utility is closing its old facility and has requested IDEM move its equipment before the shutdown in late 2011.

Figure 18 – Toxics Monitoring Network

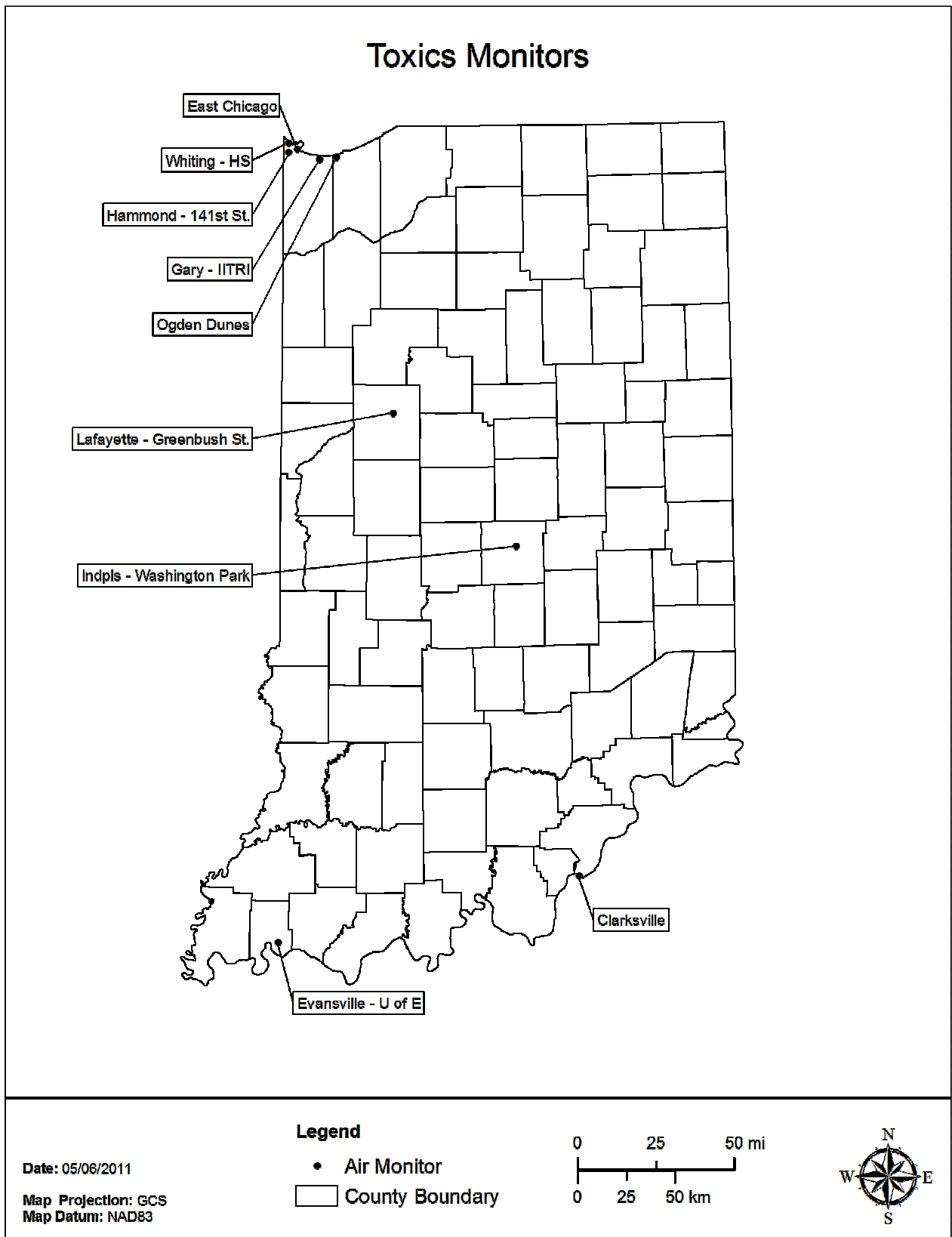


Table 23 – Toxics Monitoring Network

Toxics - VOC														
RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management														
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
180190009	Clarksville	Clark	Clarksville	Falls of the Ohio SP, 201W. Riverside Dr. Clarksville, IN	Special Purpose	03/07/08	6-Day	126	Neigh	Pop Exp	38.276628	-85.763811	Louisville/Jefferson Co.	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	Special Purpose	07/06/95	6-Day	126	Middle	Pop Exp	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	No
180890023	East Chicago - Aldis St.	Lake	East Chicago	Water Filtration Plant, 3330 Aldis St.	Special Purpose	06/01/99	6-Day	126	Neigh	Pop Exp	41.652778	-87.439444	Chicago-Naperville-Joliet, IL	Relocate
18089___	East Chicago	Lake	East Chicago		Special Purpose	2012	6-Day	126	Neigh	Pop Exp			Chicago-Naperville-Joliet, IL	Relocation
180890030	Whiting HS	Lake	Whiting	Whiting HS, 1751 Oliver St.	Special Purpose	04/01/04	6-Day	126	Neigh	Pop Exp	41.681384	-87.494722	Chicago-Naperville-Joliet, IL	No
180892008	Hammond - 141st St.	Lake	Hammond	1300 E. 141st St.	Special Purpose	02/01/89	6-Day	126	Neigh	Pop Exp	41.639444	-87.493611	Chicago-Naperville-Joliet, IL	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St.	Special Purpose	04/18/99	6-Day	126	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No
181270024	Ogden Dunes	Porter	Ogden Dunes	Water Treatment Plant, 84 Diana Rd.	Special Purpose	08/15/98	6-Day	126	Neigh	Pop Exp	41.617500	-87.199167	Chicago-Naperville-Joliet, IL	No
181570008	Lafayette - Greenbush St.	Tippecanoe	Lafayette	Cinergy Substation, 3401 Greenbush St.	Special Purpose	01/01/08	6-Day	126	Neigh	Pop Exp	40.431639	-86.852500	Lafayette	No
181630016	Evansville - U of E	Vanderburgh	Evansville	Carson Center, Walnut St.	Special Purpose	06/05/99	6-Day	126	Neigh	Pop Exp	37.974444	-87.532222	Evansville, IN-KY	No
<div> MONITORING METHOD: 126 - CRYOGENIC PRECONCENTRATION GC/FID DETECTION 128 - PERKIN ELMER 8700; AUTO GC; SUBAMBIENT DUAL FID </div>														

Carbonyls

Monitoring Requirements

Carbonyl monitoring is required as one of the components of the PAMS monitoring program. The overall requirements are addressed in Table D-6 of 40 CFR Part 58 Appendix D. The specific requirement of monitoring for carbonyls at Indiana's PAMS site is listed in the approved PAMS network plan for the Chicago nonattainment area.

Monitoring Methodology

Carbonyl data are collected using Method TO-11A of the U.S.EPA's Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air Compendium of Method. Currently Indiana uses the ATEC 2200 2C for 1/6 day sampling at Indpls - Washington Park (180970078) and the ATEC 8000 Automated Sampler for 1/6 day sampling at the Gary - IITRI (180890022) PAMS site. Samples are collected by drawing a known volume of air through a cartridge filled with silica gel coated with activated DNPH. These samples are analyzed using HPLC with a UV absorption detector.

Monitoring Network

Indiana currently operates two (2) carbonyl monitoring sites. Gary - IITRI collects data for the PAMS program. Indpls - Washington Park is conducted as part of the toxics, and PAMS monitoring network. The details of the network are in Table 24.

Network Modifications

No changes are planned for the carbonyl monitoring network in 2012.

Figure 19 – Carbonyl Monitoring Network

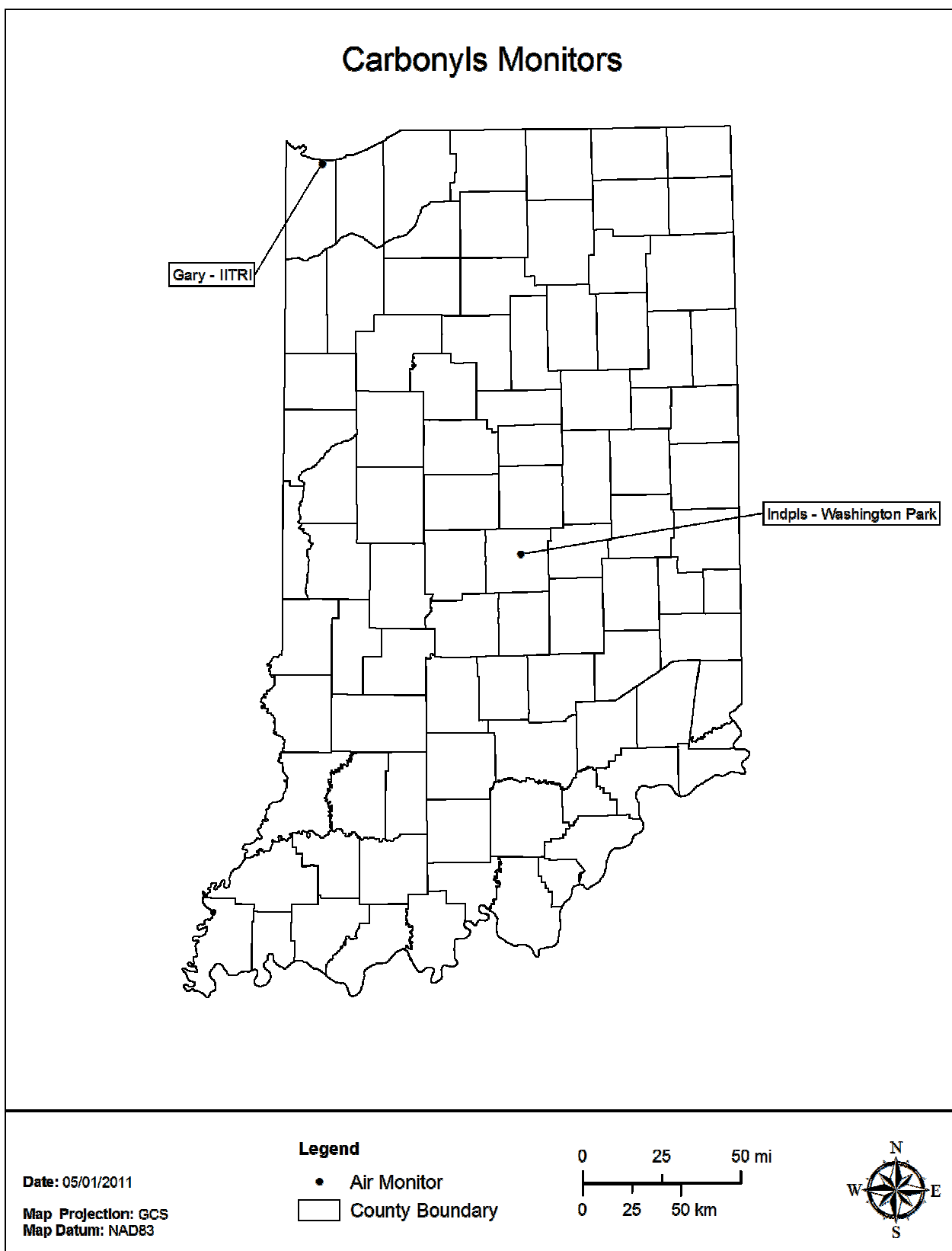


Table 24 – Carbonyl Monitoring Network

Carbonyls														
RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management														
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
180890022	Gary - ITRI	Lake	Gary	ITRI Bunker, 201 Mississippi St.	Unofficial PAMS	06/01/95	6-Day	102	Neigh	Max Prec. Em. Impact	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 320 E. 30th St	Special Purpose	04/18/99	6-Day	102	Neigh	Max Prec. Em. Impact	39.811097	-86.114469	Indianapolis-Carmel	No
MONITORING METHOD: 102 - HPLC (TO-14) DNPH-COATED CARTRIDGES														

Metals

Monitoring Requirements

There are no requirements for metals monitoring listed in 40 CFR Part 58.

Monitoring Methodology

Metals data are collected using a TSP sampler and collecting the sample on filters for a 24-hour period according to a 1/6 day sampling schedule. Filters are analyzed using the flameless atomic absorption method.

Monitoring Network

There are six (6) sites that monitor TSP metals in Indiana. Arsenic, beryllium, cadmium, chromium, lead, manganese, and nickel are monitored at Indpls – Washington Park. Due to concern over possible elevated manganese values reported in the School Air Toxics monitoring program in 2009, it was decided to analyze all the Pb samples collected in Lake and Porter Counties for manganese. These five (5) sites; Gary – 4th Ave., East Chicago – Aldis St., East Chicago – E. 135th St., Hammond – 141st St., and Portage – Highway 12, began reporting the additional metals data on January 2, 2010. When the Portage – Highway 12 site is relocated to Burns Harbor later this year, the samples from the new site will also be analyzed. These sites are detailed in Table 25.

Network Modifications

East Chicago-Aldis St. will be relocated due to the old water filtration plant closing and the property being used for other purposes.

Figure 20 – Metal Monitoring Network

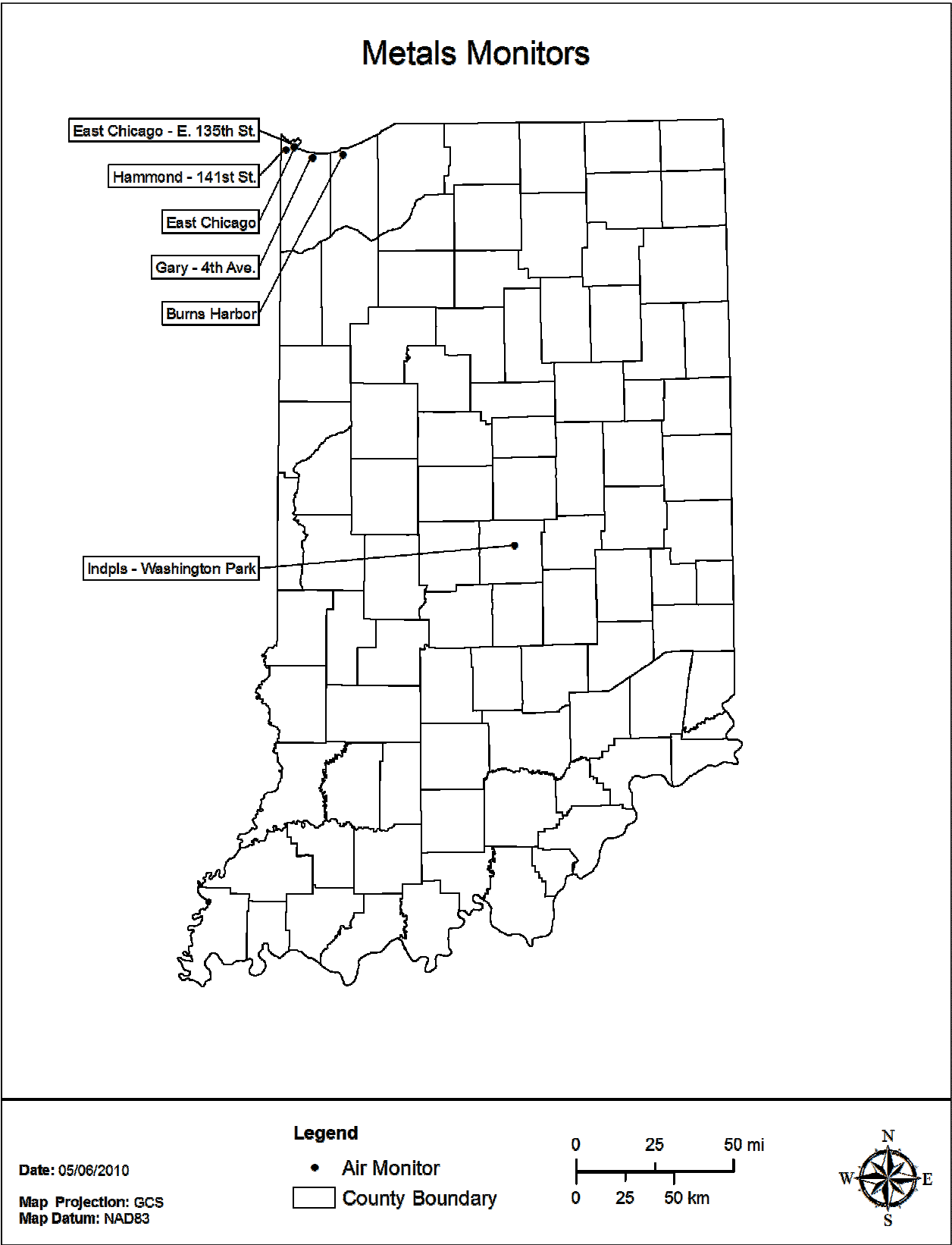


Table 25 – Metals Monitoring Network

Metals														
RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management														
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
180890023	East Chicago - Aldis St. *	Lake	East Chicago	Water Filtration Plant, 3330 Aldis St.	Special Purpose	01/02/10	6-Day	107	Middle	Source Oriented	41652778	-87.439444	Chicago-Naperville-Joliet, IL	Relocate
18089	East Chicago *	Lake	East Chicago		Special Purpose	2012	6-Day	107	Middle	Source Oriented			Chicago-Naperville-Joliet, IL	Relocation
180890032	Gary - 4th. Ave *	Lake	Gary	Gary SouthShore RailCats, One Stadium Plaza	Special Purpose	01/02/10	6-Day	107	Middle	Source Oriented	41603582	-87.332658	Chicago-Naperville-Joliet, IL	No
180890033	East Chicago - E. 135th St. *	Lake	East Chicago	Abraham Lincoln Elem. Sch., E. 135th St.	Special Purpose	01/02/10	6-Day	107	Middle	Source Oriented	41649064	-87.447256	Chicago-Naperville-Joliet, IL	No
180892008	Hammond - 141st St. *	Lake	Hammond	1300 E. 141st Street	Special Purpose	01/02/10	6-Day	107	Middle	Pop Exp	41639444	-87.493611	Chicago-Naperville-Joliet, IL	No
180892008	Hammond - 141st St. *	Lake	Hammond	1300 E. 141st Street	QA Colocated	01/02/10	6-Day	107	Middle	Quality Assurance	41639444	-87.493611	Chicago-Naperville-Joliet, IL	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St.	Special Purpose	04/18/99	6-Day	107	Middle	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No
181270023	Portage - Hwy. 12 *	Porter	Portage	Bethlehem Steel Waste Lagoon, Hwy 12	Special Purpose	01/02/10	6-Day	107	Middle	Source Oriented	41616618	-87.146959	Chicago-Naperville-Joliet, IL	Relocate
18127	Burns Harbor-Port of Indiana *	Porter			Special Purpose	2011	6-Day	107	Middle	Source Oriented			Chicago-Naperville-Joliet, IL	Relocation
<u>Metals Monitored</u> Manganese * Manganese Only Nickel Arsenic Beryllium Cadmium Chromium														
MONITORING METHOD: 107 - HI-VOL SAMPLER / ANALYSIS METHOD: FLAMELESS ATOMIC ABSORPTION														

Meteorological Monitoring

Monitoring Requirements

40 CFR Part 58 Appendix D, 3(b) specifies that the following meteorological parameters be measured for the design criteria for NCore sites; wind speed, wind direction, relative humidity, and ambient temperature. Meteorological monitoring is generally not required for SLAMS or NAMS sites; however these data support the suitability of the site along with other data sets. Many factors determine the amount and types of meteorological data that are collected in Indiana. Some of the factors include the intended use of the data and the availability of representative meteorological data that is already being collected by the National Weather Service in any given area of interest. Meteorological data are required to be collected at PAMS sites as per 40 CFR Part 58 Appendix D 5.1. This data will give the ability to observe more accurately what the atmosphere is doing at the lower boundary layer.

Monitoring Network

Meteorological data are collected at eighteen (18) sites across Indiana in 2011. This includes sites which will be installed during the remainder of 2011. Sites are established to provide coverage in all areas of the state where pollutant monitoring is conducted. Table 26 details the meteorological sites and the parameters collected.

Network Modifications

The number of meteorological monitoring sites will stay the same in 2012.

A new meteorological site will be deployed on the southwest side of Indianapolis to have more information available to model dispersion in the event of a bioterrorism event. This site was expected to be operational during 2009; however, due to siting problems the original site could not be used necessitating the search for another location. This site was expected to be operational during 2010, but again siting problems required finding another site. A site has been secured, and should be operational during 2011.

The meteorological site at Oakland City (180510012) will be discontinued, and the equipment relocated to Plummer (180550001). LADCO identified Plummer as a good upwind rural site for the comparison of data with the Indianapolis urban area. This urban-rural pairing is useful for assessing background concentrations.

Figure 21 – Meteorological Monitoring Network

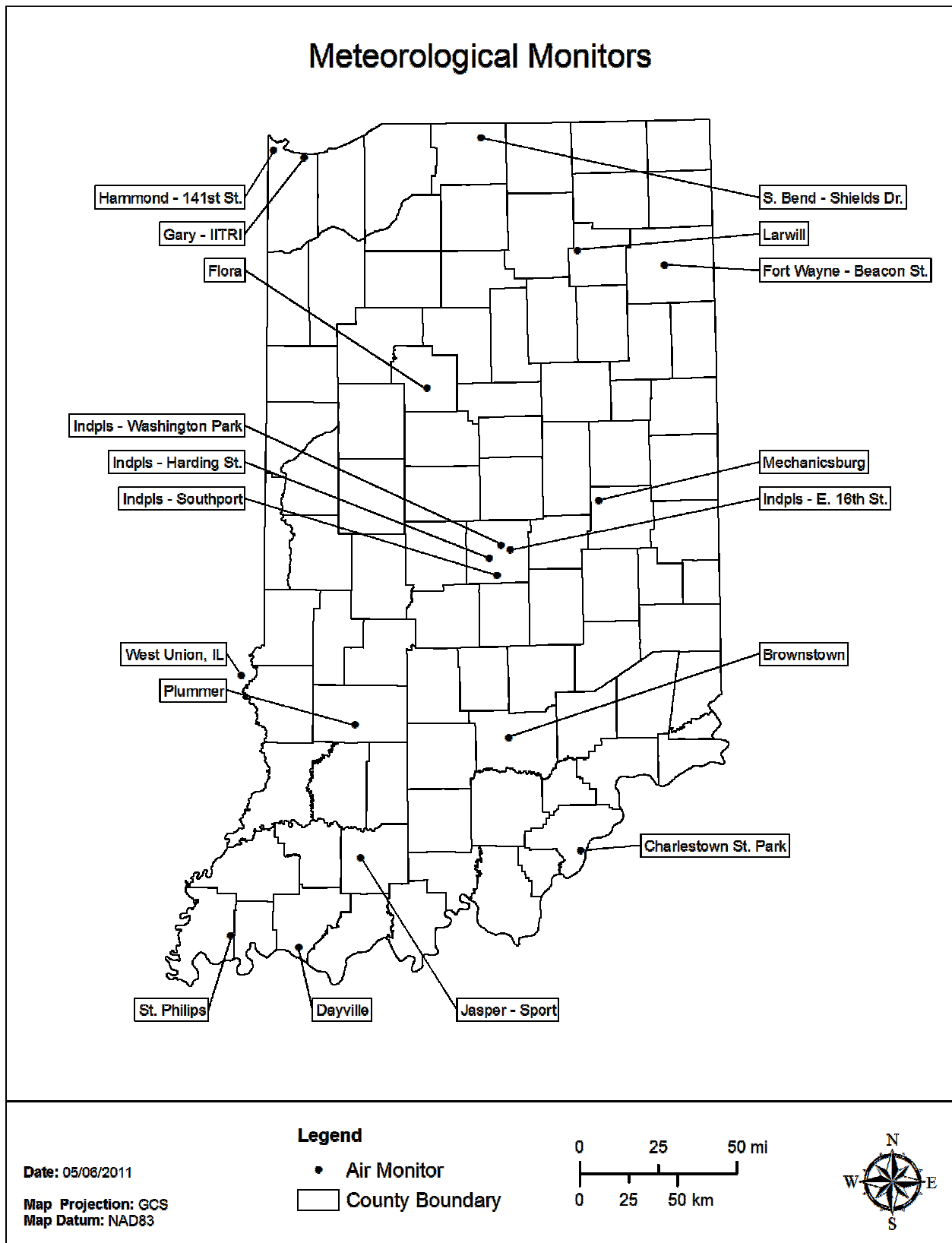


Table 26 – Meteorological Monitoring Network

Meteorological Parameters by Site															
RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management															
Site ID	Site Name	County	City	Address	Latitude	Longitude	61101 61102 WS / WD	62201 RH	64101 Baro Press	62101 Outside Temp	63302 UV Rad	63301 Solar Rad	61109 Vertical WS	65102 Precip	Site Change Proposed?
170230001	West Union	Clark Co., IL	West Union	416 S. St. Hwy 1	39.210883	-87.668416	■	■	■	■					No
180030004	Ft Wayne - Beacon St.	Allen	Fort Wayne	2022 North Beacon	41.094722	-85.101944	■	■		■					No
180150002	Flora	Carroll		Flora Airport, 481 S. 150 W	40.540556	-86.553056	■	■		■					No
180190008	Charlestown State Park	Clark		Charlestown State Park, 12500 Hwy 62, Charlestown	38.393833	-85.664167	■	■	■	■					No
180370004	Jasper Sport	Dubois	Jasper	Jasper Sport Complex - 1401 12th Ave.	38.369436	-86.959031	■								No
180510012	Oakland City	Gibson		2205 S. 1350 E., Oakland City	38.322930	-87.318789	■								Relocate
180550001	Plummer	Greene		2500 S. 275 W	38.985578	-86.990120	■	■		■					Relocation
180650003	Mechanicsburg	Henry		Shenandoah HS, 7354 W. Hwy. 36	40.011667	-85.523611	■	■		■			■		No
180710001	Brownstown	Jackson		225 W & 300 N	38.920798	-86.080523	■	■		■					No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	41.606667	-87.304722	■	■	■	■	■	■	■		No
180892008	Hammond - 141st St.	Lake	Hammond	1300 E. 141st Street	41.639444	-87.493611	■	■		■					No
18097____	Indpls - Southport	Marion	Indianapolis	Southport Advanced Wastewater Treatment Plant, 3800 W. Southport Rd			■								No
180970057	Indpls - Harding St.	Marion	Indianapolis	1321 Harding St.	39.749019	-86.186314	■	■	■	■					No
180970073	Indpls - E. 16th St.	Marion	Indianapolis	6125 E. 16th St.	39.789167	-86.060833	■	■		■	■	■		■	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	39.811097	-86.114469	■	■	■	■				■	No
181290003	St Philips	Posey		2027 S. St. Phillips Rd., Evansville	38.005278	-87.718333	■	■	■	■	■	■			No
181410015	South Bend - Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	41.696692	-86.214683	■	■		■			■		No
181730011	Dayville	Warrick		3488 Eble Rd., Newburgh	37.954450	-87.321933	■	■	■	■					No
181830003	Larwill	Whitley	Larwill	Whitko Middle School, 710 N. State Rd. 5	41.169646	-85.629292	■								No

NCore

Monitoring Requirements

40 CFR Part 58 Appendix D 3. requires each state to operate at least one NCore site and lists the minimum parameters which must be measured at that site. Currently the required parameters are; continuous and intermittent $PM_{2.5}$, $PM_{2.5}$ speciation, $PM_{10-2.5}$ particle mass, CO, O₃, SO₂, NO/NO_y, wind speed, wind direction, relative humidity, and ambient temperature.

Monitoring Network

Indiana's NCore site is Indpls–Washington Park (180970078). The details for all the NCore parameters are listed in Table 27. Except for $PM_{10-2.5}$, the parameters are also listed in the individual parameter sections.

Other parameters have also been collected at Indpls – Washington Park over the past twelve (12) years. These are listed in Table 28, as well as in the individual parameter sections.

Network Modifications

PAMS was added June 1, 2011.

No changes are planned for the NCore monitoring network in 2012.

Figure 22 – NCore Monitoring Network

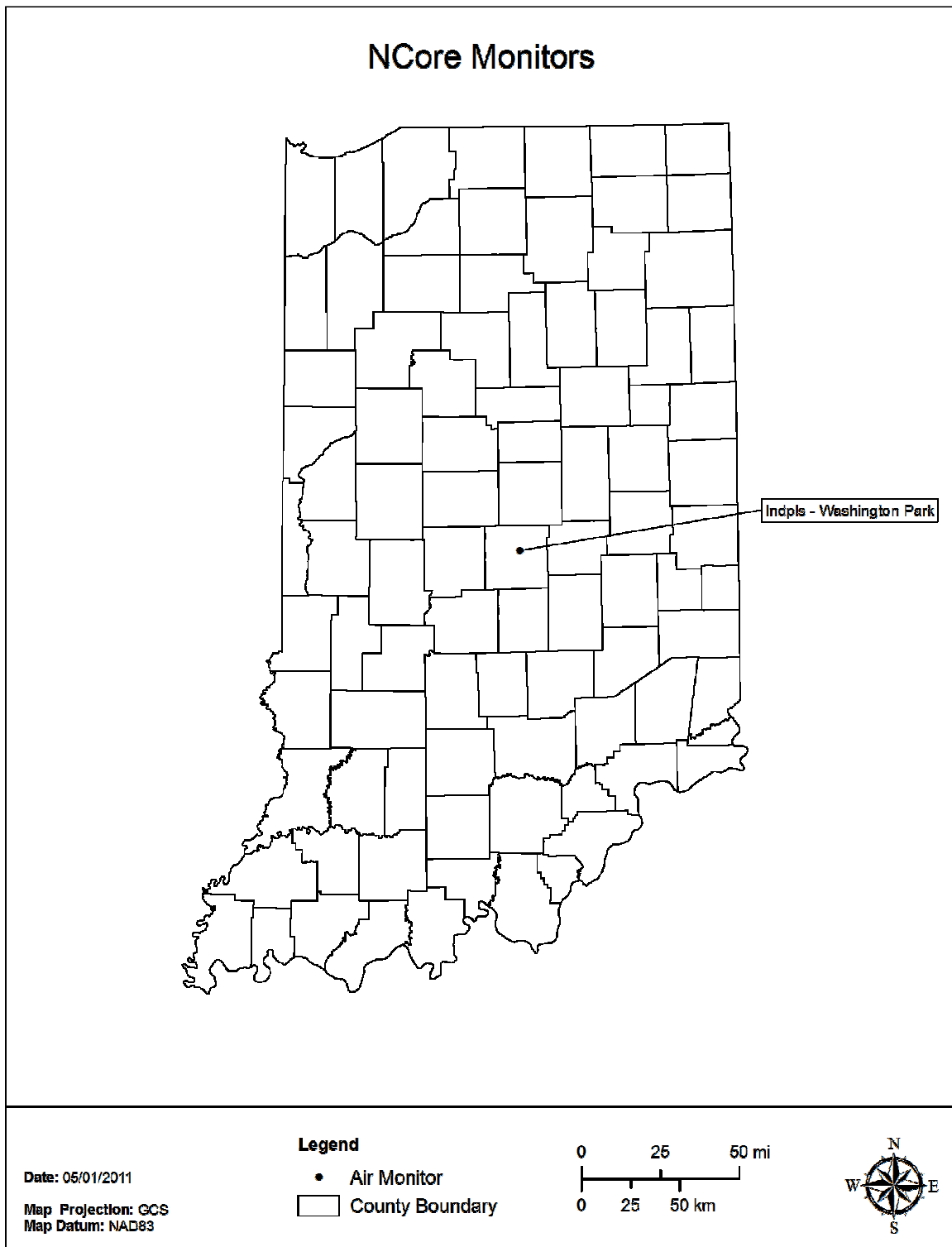


Table 27 – NCore Required Parameters

Parameter	Monitor Type	Start Date	Sampler or Monitor	Method Code	Analysis Method	Sample Frequency
CO – trace level	NCore / Index	1/1/2010	Teledyne API 300EU	593	Automated reference method utilizing trace level non-dispersive infrared analysis.	Continuous
NO	NCore	3/10/2010	Teledyne API 200EU	099	Automated reference method utilizing chemiluminescence analysis.	Continuous
NO _y	NCore	3/10/2010	Teledyne API 200EU	099	Automated reference method utilizing chemiluminescence analysis.	Continuous
O ₃	NCore / Index	4/1/2009	Thermo Electron 49i	047	Automated equivalent method utilizing uv photometry analysis.	Continuous
SO ₂ – trace level	NCore / Index	1/1/2010	Teledyne API 100EU	600	Automated equivalent method utilizing Trace Level UV Fluorescence Analysis	Continuous
Intermittent PM _{2.5}	NCore	3/7/1999	Thermo Electron 2025	145	Manual reference method utilizing gravimetric analysis.	1/1 day
Continuous PM _{2.5}	NCore / Index	1/1/2004	Thermo Electron 1400A TEOM with FDMS and 'c' drier ¹	181	Automated equivalent method* utilizing tapered element oscillating microbalance/gravimetric analysis	Continuous
Intermittent PM _{10-2.5}	NCore	7/1/2010	Thermo Scientific Partisol-Plus Model 2025 Sequential sampler	176	Manual reference method utilizing gravimetric analysis.	1/1 day
Continuous PM _{10-2.5}	NCore	Proposed 7/1/2011	Met One Instruments BAM-1020 System	185	Automated equivalent method utilizing beta ray transmission	Continuous
PM _{2.5} Speciation	Trends Speciation / NCore	12/13/2000	Met One SASS & URG 3000N	811 / 812 / 833	Multi-species manual collection method utilizing thermal optical, ion chromatography, gravimetric, and x-ray fluorescence analyses.	1/3 day
WS/WD	NCore	10/11/2009	RM Young 05305-AQ	020	Air quality measurements approved instrumentation for wind speed and wind direction	Continuous
OT/RH	NCore	10/11/2009	RM Young 41372VF	040 / 020	Air quality measurements approved instrumentation for humidity and temperature	Continuous
			¹ This method will be changed with the installation of the Met One Instruments BAMS-1020 System for PM10-2.5.			

Table 28 – Additional Parameters Collected at NCore Site

Parameter	Designation	Start Date	Sampler or Monitor	Method Code	Analysis Method	Sample Frequency
Intermittent PM ₁₀	SLAMS	7/1/2010	Thermo Electron 2025	145	Manual reference method utilizing gravimetric analysis.	1/1 day
Continuous PM ₁₀	SLAMS	Proposed 7/1/2011	Met One Instruments BAM-1020 System	185	Automated equivalent method utilizing beta ray transmission	Continuous
NO ₂	Special Purpose	Proposed 7/1/2011	Teledyne API 200EU	099	Automated reference method utilizing chemiluminescence analysis.	Continuous
Continuous Sulfate	Special Purpose	1/1/2006	Thermo Electron 5020 SPA	875	Catalytic thermal reduction fluorescence	Continuous
Continuous Black Carbon	Special Purpose	10/1/2003	Magee AE21	861	Optical Absorption	Continuous
Toxics	Special Purpose	4/18/1999	Meriter MCS-1-R	126 / 150	SS 6l canister with cryogenic GC/MS	1/6 day
Carboynls	Special Purpose	4/18/1999	ATEC 2200 2C	102	Silica DNPH cartridge w/KI O3 scrubber with HPLC (TO-11A)	1/6 day
Lead	SLAMS or NCore	4/18/1999	High Volume Sampler	803	Atomic Absorption with graphite furnace	1/6 day
Metals	Special Purpose	4/18/1999	High Volume Sampler	107	Atomic Absorption with graphite furnace	1/6 day
Precipitation	Special Purpose	10/11/2009	RM Young 52202E	014	Air quality measurements approved instrumentation for rainfall	Continuous
BP	Special Purpose	10/11/2009	Met One 594	011	Air quality measurements approved instrumentation for barometric pressure	Continuous
PAMS	Special Purpose	Proposed 7/1/2011	Perkin Elmer Clarus 500 Gas Chromatograph	128	Cryogenic Preconcentration GC/FID Detection	Continuous
Canister	Special Purpose	Proposed 7/1/2011	Meriter MCS-1-R	146	E.S.A. AC32M / Chemiluminescent	1/6 day

Appendix A
Comment Submittal Information

The proposed 2012 Ambient Air Monitoring Network Plan is posted on the IDEM website at <http://www.in.gov/idem/5342.htm> for review and comment for thirty (30) days.

Comments should be emailed to

Steve Lengerich (slengeri@idem.in.gov)

or mailed to

Steve Lengerich
100 North Senate Avenue
MC 61-50-2 Shadeland
Indianapolis, IN 46204-2251

or faxed to

317-308-3239

Network Comments

Comment #1

Received from Joanne M. Alexandrovich, Ph.D, Vanderburgh County Ozone Officer
e-mail submission on 6/24/2011

Dr. Alexandrovich submitted comments addressing the following areas:

1. Discontinued monitors and sites
 - a. Evansville Post Office
Expressed concern that interested parties were not contacted when IDEM was forced to vacate the site.
 - b. Oakland City
Expressed concern that there should be more outreach to stakeholders in the area to explain why the site is planned to be discontinued.
 - c. Southwest Ag Center (SWAG)
Expressed concern that the data collected at the proposed Plummer site may not be true background concentrations nor comparable to Southwest Ag Center.
2. Intermittent PM2.5
Noted a wording discrepancy between the PM2.5 methods mentioned on pages 44 and 46.
3. Continuous PM2.5
Expressed concern about using continuous PM2.5 data for comparison to the NAAQS for attainment/nonattainment purposes.
4. Ozone data
Requested that data outside the O3 monitoring season which are collected by IDEM be submitted into AQS.
5. Previous versions of IDEM's Network Plans
Noted that past Annual Air Monitoring Plans were not available on IDEM's website or through the Virtual File Cabinet.
6. Communication between IDEM and others
Noted that more detailed and timely response to communications regarding air monitoring issues to the Air Monitoring Branch is needed. Wants a formal process to notify and receive comments from stakeholders when network changes need to be made that were unanticipated or not spelled out in the Network Plan.

Response

- 1a. IDEM had a short time from notification until they had to discontinue the Post Office site. Past data from the three Evansville sites was compared and it was determined, as Dr. Alexandrovich states, that the data collected at this site are very comparable to the other two sites. In the future, IDEM will notify local organizations of situations such as this and also post on the Air Monitoring area of the IDEM website.
- 1b. When the Oakland City monitoring site was established in 2008, IDEM committed to operating it for three years. When it is discontinued at the end of 2011, it will have operated four years. The PM2.5 values collected at this site have been well below the standards and lower than the surrounding areas of concern, Evansville and Jasper. If the NAAQS were lowered to 13 or 12, the area would still be in attainment. See page 50 of the Plan.
- 1c. IDEM will go forward with the relocation of the Southwest Ag Center PM2.5 site to Plummer. The distance of the move is approximately 30 miles to the east northeast and the area between the old site and the new site is rural and agricultural. Due to the regional nature of PM2.5, no changes in concentration are anticipated. With the new shelter to be installed at Plummer to consolidate O3 and PM2.5, a continuous PM2.5 monitor can also be installed to provide more mapping coverage across the state. It will also result in more efficient use of resources when performing field operations.

2. The term FRM used for the intermittent samplers on page 46 is left over from a previous version of the plan. It has been changed to FEM to agree with the methodology identified on page 44.
3. IDEM agrees with Dr. Alexandrovich's concerns about using continuous PM2.5 data for comparison to the NAAQS for determining attainment or nonattainment of an area. IDEM has postponed its timetable for submitting a proposal to USEPA on when to begin officially comparing continuous and intermittent data and the exact criteria to be used until the 4th quarter of 2011. The plan would designate a two year period of comparison prior to any comparison for attainment purposes. IDEM anticipates that by that time IDEM will be able to identify acceptable criteria for comparing the continuous data to the standard. The earliest period possible to begin using the data would be in 2014.
4. IDEM operates the O3 monitors outside the season for two reasons. Audits and calibrations are performed by the on-site calibrators and by the Quality Assurance Section to ensure the complete validation of the data collected during the O3 season. The monitors were left collecting data also to eliminate startup issues which plague the instruments when they are turned off through the winter. The data are not uploaded to AQS because the data are not validated and quality-assured as they are throughout the season. At this time, IDEM does not plan to enter data outside the season.
5. IDEM agrees that it would be useful to others if past Network Reviews were available online. The past Plans should have been scanned and made available in VFC. IDEM will investigate to determine if they have or have not been entered. If they have not been, they will be entered. Due to space availability on IDEM's website, it is uncertain if the past Plans can be posted. This issue will also be investigated.
6. IDEM agrees that communication is necessary and can be improved. Often when questions are asked of staff which requires some research or analysis, they are in the field and unable to respond with an answer quickly. Certain planned maintenance and offline testing of the continuous PM2.5 monitors have been communicated in the past and will continue.

Problems do occur with the continuous monitors which may not be observed each day as the primary operator is in the field. Forecasters or others who follow an individual area closely may notice a problem before the operator is aware of it. IDEM's forecasters have access to all IDEM data online along with other states' data on AirNow. They do notify AMB often when a problem is observed. The data posted are not validated until after the end of the month. It was AMB's desire to have the 'validation bar' available on the posted validated values to aid the data users. This feature was not activated by IDEM's web team when the data site was activated.

In the future, IDEM will notify local organizations of unanticipated site moves or discontinuations and also post the information on the Air Monitoring area of the IDEM website.

Comment #2

Received from Dona Bergman, Director, Evansville Department of Sustainability, Energy & Environmental Quality
e-mail submission on June 24, 2011

Ms. Bergman concurred with and echoed Dr. Alexandrovich's remarks regarding communications (Comment #1, 6)

Response

See response in Comment #1, item 6.

Comment #3

Received from Bill McCoy, Refuge Manager, Patoka River NWR&MA
e-mail submission on June 24, 2011

Mr. McCoy requests that IDEM continue to operate the Oakland City PM2.5 monitoring site. He is also concerned about pollution from the I-69 interchange and future sources which may locate in the area.

Response

When the Oakland City monitoring site was established in 2008, IDEM committed to operating it for three years. When it is discontinued at the end of 2011, it will have operated four years. The PM2.5 values collected at this site have been well below the standards and lower than the surrounding areas of concern, Evansville and Jasper. The values are essentially identical to the rural background site located at the Southwest Ag Center, near Vincennes. See page 50 of the Plan. If the Patoka River NWR&MA plans to pursue establishing its own monitoring site(s), IDEM could assist in siting and provide guidance in operation.

Nearby monitors will continue to provide information of area pollutants. An O3 monitor is located nine miles south of Oakland City and as mentioned, PM2.5 samplers will continue to collect data in Jasper and Evansville. Due to the regional nature of these pollutants, these monitors will continue to provide data pollutant levels in the area. Source oriented SO2 monitors in and around Mt. Carmel, IL and near Petersburg provide data on this pollutant. SO2 levels decline as the emission plume disperses away from the source. With controls in place and new controls to be installed in the future, emissions are projected to decrease and ambient levels should decline further.

Currently IDEM has estimates of area and vehicle emissions based on future growth and the anticipated impact on ambient pollutant levels. Any large new source would be addressed through the permitting process.

Comment #4

Received from Rachel Lewis, private citizen
e-mail submission on June 24, 2011

Ms. Lewis requested that the Oakland City monitoring site not be discontinued. She is concerned about possible future sources locating in the area. More time to review the Plan is also requested.

Response

When the Oakland City monitoring site was established in 2008, IDEM committed to operating it for three years. When it is discontinued at the end of 2011, it will have operated four years. The PM2.5 values collected at this site have been well below the standards and lower than the surrounding areas of concern, Evansville and Jasper. The values are essentially identical to the rural background site located at the Southwest Ag Center, near Vincennes. See page 50 of the Plan.

Currently IDEM has estimates of area and vehicle emissions based on future growth and the anticipated impact on ambient pollutant levels. Any large new source would be addressed through the permitting process.

IDEM is required to submit the Network Plan to EPA by July 1, and would be unable to incorporate any later comments.

Appendix B

2012 Indiana Lead Monitoring Network Plan

Introduction

Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been from fuels in motor vehicles (such as cars and trucks) and industrial sources. Emissions from on-road vehicles decreased 99% between 1970 and 1995 due primarily to the use of unleaded gasoline. Use of leaded gasoline in highway vehicles was prohibited on December 31, 1995. Due to the phase out of leaded gasoline, ore and metals processing have become the major sources of lead emissions in the air today. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers. Combustion and smelting processes operate at high temperatures and emit submicron particulate matter lead. Material handling and mechanical operations emit larger particles of lead.

Lead NAAQS

USEPA promulgated a new lead NAAQS on October 15, 2008. The new standard is set forth in 40 CFR Part 50.

§50.16 National primary and secondary ambient air quality standards for lead.

(a) The national primary and secondary ambient air quality standards for lead (Pb) and its compounds are 0.15 micrograms per cubic meter, arithmetic mean concentration over a 3-month period, measured in the ambient air as Pb either by:

(1) A reference method based on Appendix G of this part and designated in accordance with part 50 of this chapter or;

(2) An equivalent method designated in accordance with part 53 of this chapter.

(b) the national primary and secondary ambient air quality standards for Pb are met when the maximum arithmetic 3-month mean concentration for a 3-year period, as determined in accordance with Appendix R of this part, is less than or equal to 0.15 micrograms per cubic meter.

This new standard was strengthened by a factor of 10, from 1.5 $\mu\text{g}/\text{m}^3$ with a quarterly average, to 0.15 $\mu\text{g}/\text{m}^3$ with a rolling 3 month average.

Monitoring Requirements

Along with the new NAAQS promulgated in 2008, new monitoring requirements were issued. 40 CFR Part 58 Appendix D, 4.5 specifies that Pb monitoring must be conducted, taking into account Pb sources which are expected to or have been shown to contribute to maximum Pb concentrations in ambient air in excess of the NAAQS, the potential for high population exposure, and logistics of siting a monitor. At a minimum there must be one (1) source-oriented SLAMS site located to measure the maximum Pb concentration in ambient air resulting from each Pb source which emits 1.0 or more tons per year. The facility emissions are to be based on the most recent National Emission Inventory or other scientifically justifiable methods and data, such as improved emissions factors or site-specific data. Waivers may be granted if the state can demonstrate that the Pb source will not contribute to a maximum Pb concentration in ambient air in excess of 50% (0.075 $\mu\text{g}/\text{m}^3$) of the NAAQS. The source-oriented sites are to be operational by January 1, 2010.

In addition, one (1) non source-oriented SLAMS site is required in each CBSA with a population equal to or greater than 500,000 people. These sites are to be operational by January 1, 2011.

Indiana performed this initial analysis and submitted its Lead Monitoring Plan to USEPA on July 1, 2009. It was approved and the source oriented sites were deployed in December 2009 and January 2010.

Indianapolis – Washington Park (180970078) was designated as the non source-oriented site. It has been collecting data since 1999.

In December 2010 USEPA promulgated new monitoring requirements, essentially moving the modeling requirements from 1.0 tpy to 0.5 tpy and listing the airports which would be required to be monitored for Pb. The requirement for the non source-oriented monitoring was also changed. The monitoring would now be required at each NCore site in a CBSA with a population of 500,000 or more. All monitors are to begin sampling by December 27, 2011.

Indiana's PB Sources

A list of seventeen (17) sources was identified by USEPA as meeting the criteria of emitting greater than 0.5 tpy of Pb. Table B1 lists the sources. This list included those higher emitting sources which had monitors established in 2010. After updating the list with more current information, such as more current state emissions data (bolded values in Table B1) and plant status, it was determined that there were no new sources which were above 0.5 tpy Pb emissions, and therefore no new Pb monitoring sites have to be established.

Some notes of clarification for the list:

Essroc Cement Corp in Cass County

The 2005 NEI data are questionable based on the most recent information. The facility reported 0.15 tons in 2008 and has never reported greater than 0.5 tons to TRI. The Title V permit does not contain any Pb estimates.

Auburn Foundry Plant 1 in DeKalb County

This facility has closed and is no longer in operation.

D&W Inc. in Elkhart County

The NEI data listed for 2005 is outdated 2002 reported data. Lead emissions are estimated to be 0.00 tpy in the minor source operating permit. Reporting to TRI in 2009 was also 0.00 tons.

Saint-Gobain Containers in Jay County

The facility has not reported any emissions since 2006. The Title V permit does not contain any Pb estimates.

PSC Metals (SMS Mill Services) in Porter County

These emissions are from a scrap metal torch cutting operation at ISG Burns Harbor Steel Mill. They had reported emissions in the 0.5 tpy range in the past. The last two years in the State E.I. are less than 0.5 tons. PSC Metals, now SMS Mill Services, is located on the northeast part of ISG's property. Any impact on the monitoring site from ISG would also include any possible impact from SMS.

RMG Foundry in St. Joseph County

This facility closed in October 2006.

Monitoring Network

No new source oriented sites are required as a result of the lowered emissions limit. Indpls – Washington Park has been approved as Indiana's NCore site. Pb monitoring has been conducted at this site since 1999, thus fulfilling Indiana's NCore monitoring requirement.

IDEM has been informed that a new water treatment plant is being constructed in East Chicago. No actual date has been given when the site located there, East Chicago – Aldis St., must be discontinued. Survey work has begun and the plan is to obtain a new site by January 1, 2012.

The monitoring network to be operated in 2012 is shown in Table B2. More detailed information for Indiana's Pb sites is presented in Table 4 of the Lead section in the Indiana 2012 Ambient Air Monitoring Network Plan.

Table B1 – Indiana Lead Sites with >0.5 tpy Emissions

State	County	Facility Name	Address	City	Long	Lat	NEI	TRI					State E.I.					Need monitor?
							05	05	06	07	08	09	05	06	07	08	09	
IN	Cass	Essroc Cement Corp.	3084 W County Rd. 225 S.	Logansport	-	40.730	0.74	0.11	0.06	0.03	0.04	0.03	0.15			0.00		no
IN	De Kalb	Auburn Foundry Plant 1	635 W. 11th St.	Auburn	85.064	41.364	0.81	0.00	0.00	0.00	0.00	0.00						no
IN	Delaware	Exide Technologies	2601 W. Mt. Pleasant Blvd.	Muncie	85.416	40.158	1.47	0.46	0.48	0.87	0.52	0.39			0.80			existing
IN	Elkhart	D&W Inc.	941 Oak St.	Elkhart	85.994	41.696	0.58	0.00	0.00	0.00	0.00	0.00						no
IN	Jay	Saint-Gobain Containers	524 E. Center St.	Dunkirk	85.219	40.376	0.59	0.27	0.30	0.28	0.28	0.28	0.58	0.58				no
IN	Lake	Mittal Steel - East	3210 Watling Street	East Chicago	87.440	41.653	2.99	1.05	1.06	5.53	4.85	2.35	3.54	4.25	5.00	4.98	2.66	existing
IN	Lake	Mittal Steel - West	3001 Dickey Rd.	East Chicago	87.447	41.649	0.44	0.52	0.53	10.9	9.87	0.87	0.44	5.00	5.00	> 5	0.20	existing
IN	Lake	US Steel Gary Works	One North Broadway	Gary	87.337	41.609	0.93	0.96	1.65	1.26	1.21	1.35	0.92	0.92	1.00	0.89	0.85	existing
IN	Marion	Indianapolis Belmont WWTP	2700 S Belmont Ave.	Indianapolis	86.195	39.727	1.00								0.10	0.10	0.09	no
IN	Marion	Quemetco, Inc.	7870 W. Morris St.	Indianapolis	86.300	39.754	1.71	0.56	0.53	0.62	0.63	0.44	0.60	0.50	0.64			existing
IN	Noble	Dalton Corp	200 W. Ohio St.	Kendallville	85.276	41.441	0.62	0.00	0.00	0.00	0.06	0.02	0.62	0.58	0.57	0.10	0.00	no
IN	Perry	Thyssenkrupp Waupaca	9856 State Hwy 66	Tell City	86.769	37.986	1.09	0.84	0.84	0.84	0.03	0.02	1.09	1.08	0.12	0.03	0.03	no
IN	Porter	ISG Burns Harbor LLC	250 W US Hwy 12	Burns Harbor	87.147	41.617	3.62	4.63	3.20	3.55	3.30	1.75	3.62	2.23	2.66	2.45	1.17	existing
IN	Porter	PSC Metals	U.S. Hwy 12	Burns Harbor	87.145	41.621	0.68	0.00	0.00	0.00	0.00	0.00		0.50	0.50	0.03	0.45	no
IN	Putnam	Lone Star Industries Landfill	3301 S. County Rd 150 W	Greencastle	86.881	39.612	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	no
IN	Joseph	RMG Foundry (form. Dodge)	500 W Union St.	Mishawaka	86.176	41.658	0.57	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	no
IN	Whitley	Steel Dynamics Structural	2601 County Rd. 700 E.	Columbia City	85.508	41.142	0.58	0.94	1.24	1.40	0.00	0.00	0.60	0.60	0.18	0.17	0.15	no

Table B2 - Lead Monitoring Network for 2012

Site ID	County	City	Site Name	Required Monitor	Monitoring Objective	Source	Start Date
180350009	Delaware	Muncie	Muncie - W. Pleasant Blvd.	Yes	Source Oriented	Exide Technologies	1/2/2010
180890032	Lake	Gary	Gary - 4th Ave.	yes	Source Oriented	US Steel Gary Works	1/2/2010
180890033	Lake	East Chicago	East Chicago - E. 135th St	Yes	Source Oriented	Mittal Steel - West	1/2/2010
180892008	Lake	Hammond	Hammond 141st St.	No	Population Exposure		1/1/1977
1808900__	Lake	East Chicago	Relocation of East Chicago - Aldis St.	Yes	Source Oriented	Mittal Steel - East	1/1/2012
180970063	Marion	Indianapolis	Indpls - Rockville Rd	No	Source Oriented	Quemetco	1/1/1984
180970078	Marion	Indianapolis	Indpls - Washington Park	Yes	Population Exposure		4/18/1999
181270027	Porter		Burns Harbor - Port of Indiana	Yes	Source Oriented	ISG Burns Harbor	7/1/2011

Appendix C

2012 Indiana SO₂ Monitoring Network Plan

Introduction

Sulfur dioxide is a gaseous pollutant that is emitted primarily by industrial furnaces, electric power plants, or large boilers burning coal or oil containing sulfur. Overall SO₂ levels have decreased since the mid 1970's due to various controls and scrubbers along with the conversion to coal containing lower percentages of sulfur. The original primary and secondary NAAQS for SO₂ were established in 1971.

New NAAQS

U.S.EPA promulgated an additional primary SO₂ NAAQS on June 10, 2010. The new standard considers the shorter time period of one hour and is set forth in 40 CFR Part 50.

§ 50.17 National primary ambient air quality standards for sulfur oxides (sulfur dioxide).

- (a) The level of the national primary 1-hour annual ambient air quality standard for oxides of sulfur is 75 parts per billion (ppb, which is 1 part in 1,000,000,000), measured in the ambient air as sulfur dioxide (SO₂).
- (b) The 1-hour primary standard is met at an ambient air quality monitoring site when the three-year average of the annual (99th percentile) of the daily maximum 1-hour average concentrations is less than or equal to 75 ppb, as determined in accordance with appendix T of this part.
- (c) The level of the standard shall be measured by a reference method based on appendix A or A-1 of this part, or by a Federal Equivalent Method (FEM) designated in accordance with part 53 of this chapter.

Monitoring Requirements

40 CFR Part 58 Appendix D, 4.4, also promulgated on June 10, 2010, specifies the requirements for the SO₂ network design with regard to the new NAAQS. The PWEI, a new term in monitoring site requirements, is used to define the areas and the number of monitoring sites to be located in those areas. The requirements are as follows:

4.4.2 Requirement for Monitoring by the Population Weighted Emissions Index.

- (a) The population weighted emissions index (PWEI) shall be calculated by States for each core based statistical area (CBSA) they contain or share with another State or States for use in the implementation of or adjustment to the SO₂ monitoring network. The PWEI shall be calculated by multiplying the population of each CBSA, using the most current census data or estimates, and the total amount of SO₂ 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 for each county in each CBSA. The resulting product shall be divided by one million, providing a PWEI value, the units of which are million persons-tons per year. For any CBSA with a calculated PWEI value equal to or greater than 1,000,000, a minimum of three SO₂ monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 100,000, but less than 1,000,000, a minimum of two SO₂ monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 5,000, but less than 100,000, a minimum of one SO₂ monitor is required within that CBSA.

(1) The SO₂ monitoring site(s) required as a result of the calculated PWEI in each CBSA shall satisfy minimum monitoring requirements if the monitor is sited within the boundaries of the parent CBSA and is one of the following site types (as defined in section 1.1.1 of this appendix): population exposure, highest concentration, source impacts, general background, or regional transport. SO₂ monitors at NCore stations may satisfy minimum monitoring requirements if that monitor is located within a CBSA with minimally required monitors under this part. Any monitor that is sited outside of a CBSA with minimum monitoring requirements to assess the highest concentration resulting from the impact of significant sources or source categories existing within that CBSA shall be allowed to count towards minimum monitoring requirements for that CBSA.

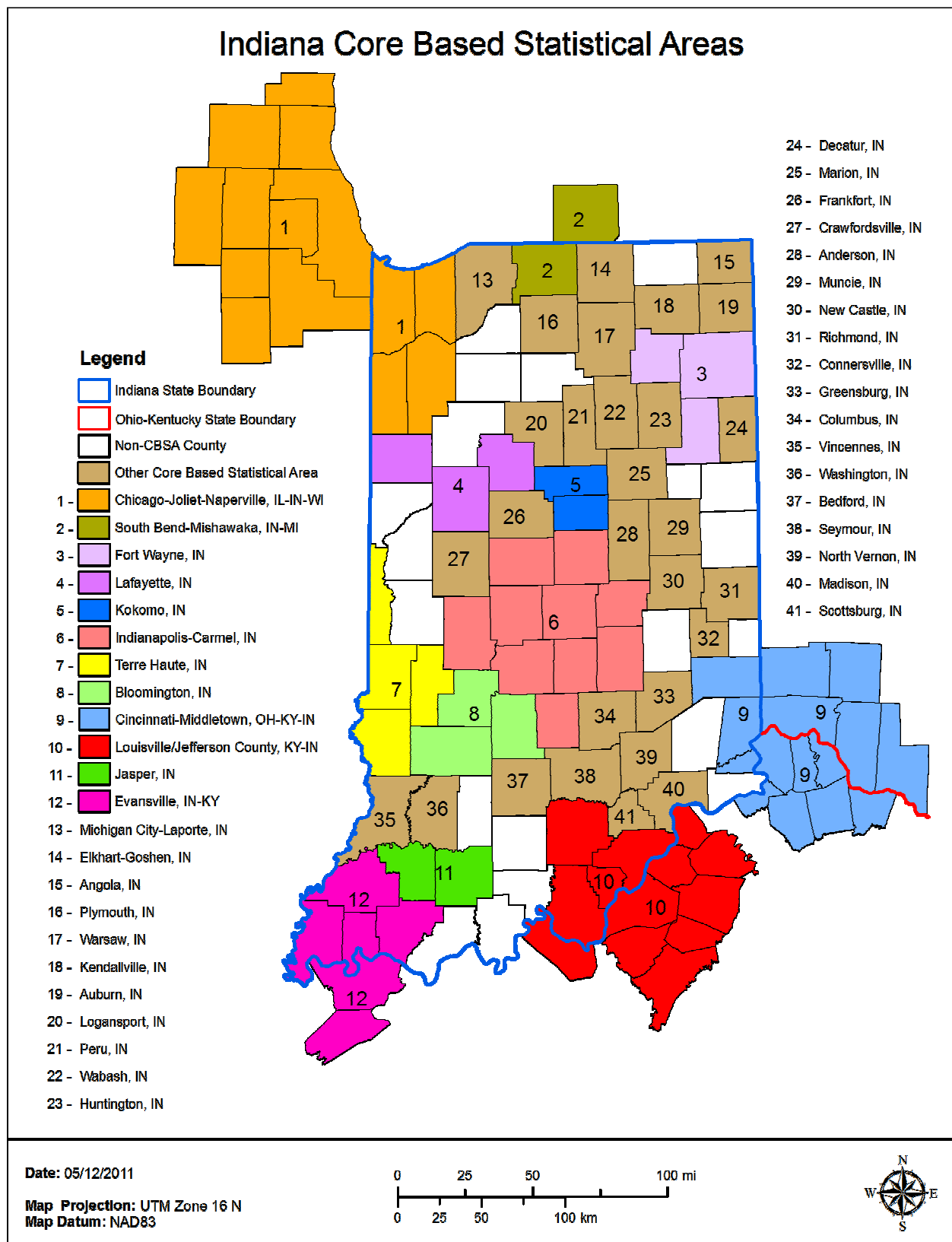
4.4.3 Regional Administrator Required Monitoring

(a) The Regional Administrator may require additional SO₂ monitoring stations above the minimum number of monitors required in 4.4.2 of this part, where the minimum monitoring requirements are not sufficient to meet monitoring objectives. The Regional Administrator may require, at his/her discretion, additional monitors in situations where an area has the potential to have concentrations that may violate or contribute to the violation of the NAAQS, in areas impacted by sources which are not conducive to modeling, or in locations with susceptible and vulnerable populations, which are not monitored under the minimum monitoring provisions described above. The Regional Administrator and the responsible State or local air monitoring agency shall work together to design and/or maintain the most appropriate SO₂ network to provide sufficient data to meet monitoring objectives.

CBSAs

As indicated in the regulation, the basic geographical unit is the CBSA. The map in Figure C1 shows the counties which make up the individual CBSAs, both inside Indiana and those which are shared by two or three states. The CBSAs are a combination of the defined metropolitan statistical areas (MSA) and the micropolitan statistical areas.

Figure C1- Map of Indiana CBSAs



Indiana's Required Network

When the new monitoring requirements were published in June 2010, the number of sites required was determined by using SO₂ emissions data from the 2005 NEI and estimated population from 2008. Table C1 presents these data, the PWEl, and the number of required sites per CBSA. Using these values, 12 sites would be required in the top six CBSAs, either in Indiana or encompassing Indiana and the neighboring state(s).

Table C1- Indiana's Required SO₂ Sites (2005 NEI and 2008 Population Estimates)

CBSA ID	CBSA Name	SO₂ per CBSA in tons per yr	CBSA Population (2008 Census Est.)	PWEl in Million persons-tpy	Monitors Required
16980	Chicago-Naperville-Joliet, IL-IN-WI	271,916	9,569,624	2,602,133	3
17140	Cincinnati-Middletown, OH-KY-IN	247,190	2,155,137	532,728	2
31140	Louisville/Jefferson County, KY-IN	123,642	1,244,696	153,897	2
26900	Indianapolis-Carmel, IN	85,224	1,715,459	146,199	2
21780	Evansville, IN-KY	287,769	350,261	100,794	2
45460	Terre Haute, IN	173,841	170,233	29,593	1
27540	Jasper, IN	54,485	54,018	2,943	0
43780	South Bend-Mishawaka, IN-MI	8,440	316,865	2,674	0
31500	Madison, IN	75,127	32,820	2,466	0
23060	Fort Wayne, IN	5,097	411,154	2,096	0
33140	Michigan City-La Porte, IN	18,000	110,888	1,996	0
29140	Lafayette, IN	9,396	192,870	1,812	0
21140	Elkhart-Goshen, IN	5,604	199,137	1,116	0
39980	Richmond, IN	12,859	67,795	872	0
14020	Bloomington, IN	2,840	183,944	522	0
34620	Muncie, IN	2,555	114,685	293	0
47180	Vincennes, IN	7,420	38,057	282	0
35860	North Vernon, IN	7,808	28,040	219	0
13260	Bedford, IN	4,523	45,913	208	0
29020	Kokomo, IN	2,087	99,304	207	0
30900	Logansport, IN	5,242	39,123	205	0
11300	Anderson, IN	1,397	131,501	184	0
47700	Warsaw, IN	1,724	76,275	131	0
18020	Columbus, IN	1,406	75,360	106	0
18820	Crawfordsville, IN	1,877	37,805	71	0
12140	Auburn, IN	1,574	41,884	66	0
31980	Marion, IN	929	68,609	64	0
28340	Kendallville, IN	1,261	47,601	60	0
38500	Plymouth, IN	840	46,709	39	0
19540	Decatur, IN	1,079	33,985	37	0
42980	Seymour, IN	813	42,193	34	0
26540	Huntington, IN	905	37,570	34	0
37940	Peru, IN	907	36,219	33	0
11420	Angola, IN	782	33,368	26	0
47340	Wabash, IN	750	32,706	25	0
35220	New Castle, IN	471	47,162	22	0
23140	Frankfort, IN	647	34,069	22	0
24700	Greensburg, IN	636	24,998	16	0
18220	Connersville, IN	484	24,265	12	0
47780	Washington, IN	324	28,319	9	0
42500	Scottsburg, IN	316	23,627	7	0

Since the promulgation of the monitoring requirements, the 2010 Census data have become available. The 2008 NEI has also been released. Table C2 uses these data to calculate the number of required sites. The top six CBSAs still require monitoring sites, but the number of sites required has decreased to 10. Indianapolis-Carmel and Evansville would now only be required one site in each CBSA.

Table C2 - Indiana's Required SO₂ Sites (2008 NEI and 2010 Census)

CBSA ID	CBSA Name	SO₂ per CBSA in tons per yr (2008)	CBSA Population (2010 Census)	PWEl in Million persons-tpy	Required Sites
16980	Chicago-Naperville-Joliet, IL-IN-WI	173,256	9,461,105	1,639,193	3
17140	Cincinnati-Middletown, OH-KY-IN	112,644	2,130,151	239,949	2
31140	Louisville/Jefferson County, KY-IN	84,635	1,283,566	108,635	2
26900	Indianapolis-Carmel, IN	39,522	1,756,241	69,410	1
21780	Evansville, IN-KY	115,815	358,676	41,540	1
45460	Terre Haute, IN	141,309	172,425	24,365	1
27540	Jasper, IN	50,284	54,734	2,752	0
31500	Madison, IN	64,946	32,428	2,106	0
33140	Michigan City-La Porte, IN	11,150	111,467	1,243	0
29140	Lafayette, IN	5,527	201,789	1,115	0
43780	South Bend-Mishawaka, IN-MI	2,292	319,224	732	0
39980	Richmond, IN	8,707	68,917	600	0
14020	Bloomington, IN	2,357	192,714	454	0
47180	Vincennes, IN	7,608	38,440	292	0
23060	Fort Wayne, IN	302	416,257	126	0
30900	Logansport, IN	629	38,966	25	0
21140	Elkhart-Goshen, IN	67	197,559	13	0
26540	Huntington, IN	246	37,124	9	0
11300	Anderson, IN	40	131,636	5	0
34620	Muncie, IN	34	117,671	4	0
18820	Crawfordsville, IN	82	38,124	3	0
47700	Warsaw, IN	33	77,358	3	0
29020	Kokomo, IN	25	98,688	2	0
31980	Marion, IN	27	70,061	2	0
18020	Columbus, IN	21	76,794	2	0
47340	Wabash, IN	40	32,888	1	0
13260	Bedford, IN	24	46,134	1	0
12140	Auburn, IN	26	42,223	1	0
42980	Seymour, IN	25	42,376	1	0
35220	New Castle, IN	21	49,462	1	0
38500	Plymouth, IN	20	47,051	1	0
28340	Kendallville, IN	19	47,536	1	0
24700	Greensburg, IN	33	25,740	1	0
11420	Angola, IN	21	34,185	1	0
23140	Frankfort, IN	18	33,224	1	0
19540	Decatur, IN	17	34,387	1	0
37940	Peru, IN	14	36,903	1	0
47780	Washington, IN	12	31,648	0	0
35860	North Vernon, IN	10	28,525	0	0
42500	Scottsburg, IN	9	24,181	0	0
18220	Connersville, IN	8	24,277	0	0

During 2008 several of the coal-fired power plants in Indiana decreased their SO₂ emissions due to new controls and scrubbers going on line. These reductions in SO₂ emissions became apparent in the reporting from the facilities in 2009. Table C3 lists the revised emissions data using the 2008 NEI for the

out of state county emissions and the updated 2009 reported and calculated emissions from the Indiana counties. Using these data along with the 2010 Census data for the populations, the number of sites required is reduced further to nine, one less site now required in the Louisville/Jefferson County CBSA.

Table C3 - Indiana's Required SO₂ Sites (2009 Updated Indiana Counties, 2008 NEI for out of state Counties and 2010 Census)

CBSA ID	CBSA Name	SO₂ per CBSA in tons per yr (2008/2009)	CBSA Population (2010 Census)	PWEl in Million persons-tpy	Required Sites
16980	Chicago-Naperville-Joliet, IL-IN-WI	175,616*	9,461,105	1,661,521	3
17140	Cincinnati-Middletown, OH-KY-IN	103,441*	2,130,151	220,345	2
31140	Louisville/Jefferson County, KY-IN	73,759*	1,283,566	94,675	1
26900	Indianapolis-Carmel, IN	40,201	1,756,241	70,603	1
21780	Evansville, IN-KY	57,454*	358,676	20,607	1
45460	Terre Haute, IN	70,954	172,425	12,234	1
27540	Jasper, IN	64,200	54,734	3,514	0
31500	Madison, IN	54,476	32,428	1,767	0
43780	South Bend-Mishawaka, IN-MI	3,421*	319,224	1,092	0
29140	Lafayette, IN	5,393	201,789	1,088	0
33140	Michigan City-La Porte, IN	9,438	111,467	1,052	0
14020	Bloomington, IN	2,713	192,714	523	0
39980	Richmond, IN	3,922	68,917	270	0
34620	Muncie, IN	1,466	117,671	173	0
47180	Vincennes, IN	1,427	38,440	55	0
30900	Logansport, IN	1,231	38,966	48	0
23060	Fort Wayne, IN	100	416,257	42	0
19540	Decatur, IN	1,196	34,387	41	0
11300	Anderson, IN	303	131,636	40	0
13260	Bedford, IN	705	46,134	33	0
47340	Wabash, IN	500	32,888	16	0
18820	Crawfordsville, IN	234	38,124	9	0
26540	Huntington, IN	199	37,124	7	0
12140	Auburn, IN	160	42,223	7	0
37940	Peru, IN	169	36,903	6	0
23140	Frankfort, IN	137	33,224	5	0
35860	North Vernon, IN	121	28,525	3	0
21140	Elkhart-Goshen, IN	12	197,559	2	0
47780	Washington, IN	36	31,648	1	0
29020	Kokomo, IN	7	98,688	1	0
42980	Seymour, IN	16	42,376	1	0
28340	Kendallville, IN	12	47,536	1	0
18020	Columbus, IN	4	76,794	0	0
47700	Warsaw, IN	2	77,358	0	0
35220	New Castle, IN	1	49,462	0	0
38500	Plymouth, IN	1	47,051	0	0
24700	Greensburg, IN	1	25,740	0	0
31980	Marion, IN	0	70,061	0	0
11420	Angola, IN	0	34,185	0	0
18220	Connersville, IN	0	24,277	0	0
42500	Scottsburg, IN	0	24,181	0	0

*These CBSAs use 2008 NEI data for non Indiana Counties

As can be seen from the emissions data between the three tables, the levels of SO₂ being emitted into the atmosphere is decreasing each year. The total amount of SO₂ detailed in Table C1 is 1,430,189 tons

released. In Table C2 the total is 821,875 tons, while the most current information in Table C3 indicated there were 673,028 tons of SO₂ emitted.

Even though Table C3 indicates that nine sites are required, Indiana proposes to use the 10 sites required by the emissions and populations in Table C2 when developing the network

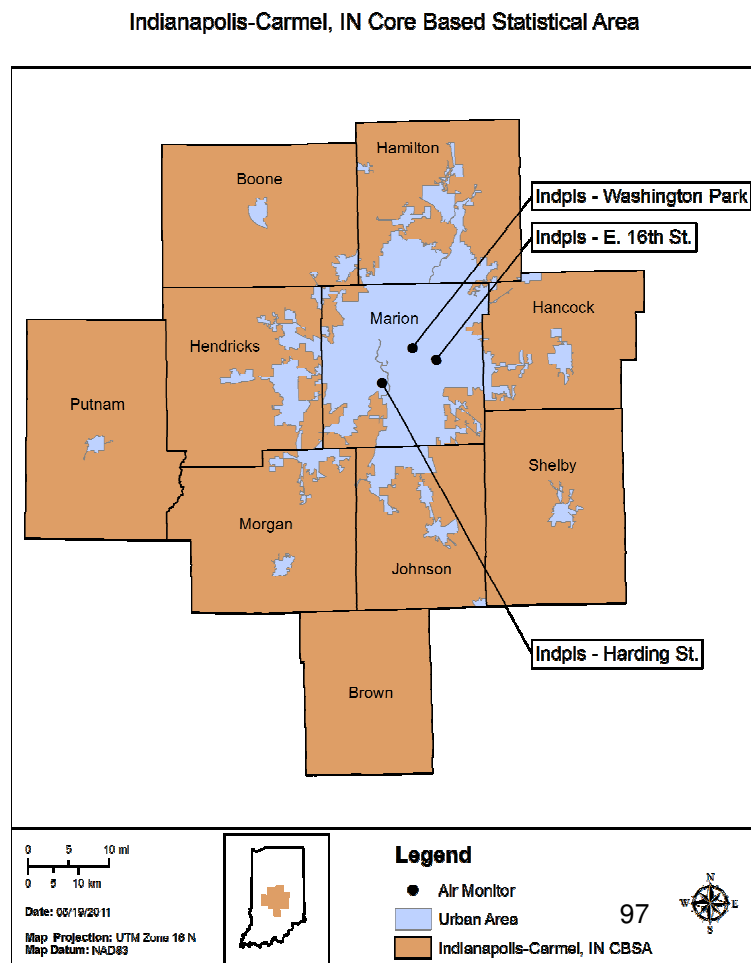
CBSA Details

Indianapolis-Carmel

The Indianapolis-Carmel CBSA includes the city of Indianapolis in Marion County and the surrounding counties of Boone, Brown, Hamilton, Hancock, Hendricks, Johnson, Morgan, Putnam, and Shelby. The population of the area determined from the 2010 Census is 1,756,241. According to the 2008 NEI there were 39,522 tons of SO₂ emitted from point, area, and mobile sources. This yields a PWEI of 69,410 million persons-tpy for the area. One site is required.

Currently there are three sites operated by IDEM in the Indianapolis-Carmel CBSA. Indpls – Washington Park is the NCore site for Indianapolis. It is located in a more densely populated area of the city, northeast of the CBD. Indpls – E 16th St. is located in a less densely populated area in the eastern part of the city. Both sites record values indicative of much of the Indianapolis Urban area and are considered to be population exposure sites. The Indpls – Harding St. site is located in the more industrialized southwest part of the city and yields somewhat higher values. It is considered to be a population exposure site also, in addition to being located in the higher concentration area of the city. For the 2008-2010 period, the values from this site are above the 1-hour NAAQS. The map in Figure C2 gives the location of the sites. More detailed information for the sites is presented in Table 20 of the SO₂ section in the Indiana 2012 Ambient Air Monitoring Network Plan.

Figure C2 – SO₂ Sites Indianapolis-Carmel CBSA



All three sites meet the criteria for SO₂ network design in 40 CFR Part 58 Appendix D 4.4 Sulfur Dioxide (SO₂) Design Criteria. They will be considered the monitoring network for the Indianapolis-Carmel CBSA. No new sites are needed.

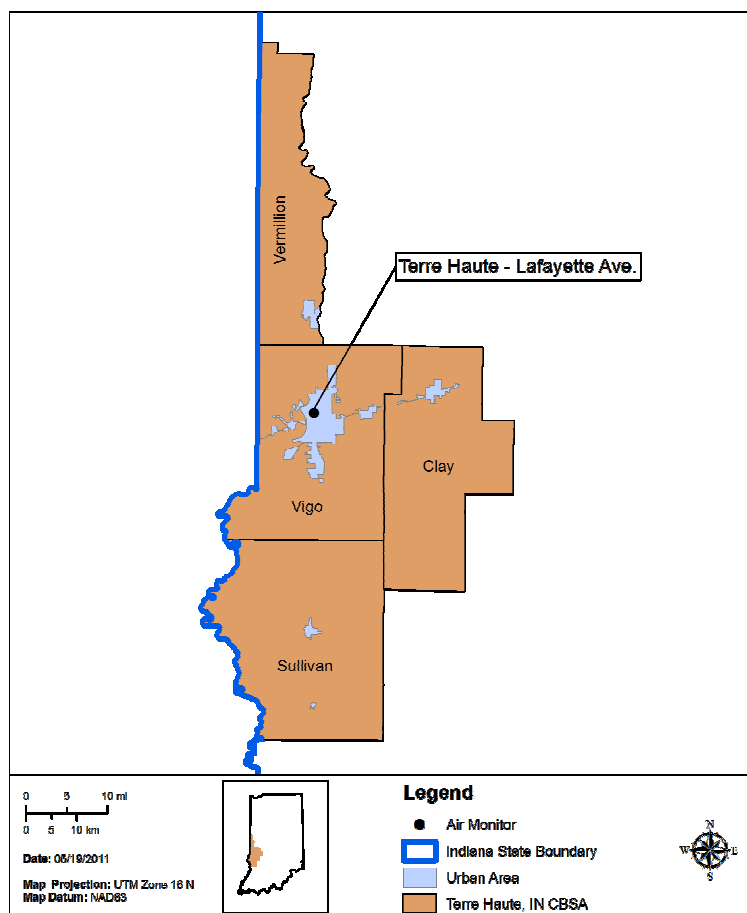
Terre Haute

The Terre Haute CBSA includes the city of Terre Haute in Vigo County and the surrounding Indiana counties of Clay, Sullivan, and Vermillion. The population of the area determined from the 2010 Census is 172,425. According to the 2008 NEI there were 141,309 tons of SO₂ emitted from point, area, and mobile sources. This yields a PWEI of 24,365 million persons-tpy for the area. One site is required.

IDEM operates one site, Terre Haute – Lafayette Ave., in Terre Haute. It is located in the urban area north of the CBD. It is considered a population exposure site, but is influenced by the Duke Energy Indiana – Wabash River Generating Station located 3 km to the north. The map in Figure C3 shows the location of the site in the Terre Haute CBSA. More detailed information for the site is presented in Table 20 of the SO₂ section in the Indiana 2012 Ambient Air Monitoring Network Plan.

Figure C3 – SO₂ Sites Terre Haute CBSA

Terre Haute, IN Core Based Statistical Area



Terre Haute – Lafayette Ave meets the criteria for SO₂ network design in 40 CFR Part 58 Appendix D 4.4 Sulfur Dioxide (SO₂) Design Criteria. It will be considered the monitoring network for the Terre Haute CBSA. No new sites are needed.

Evansville

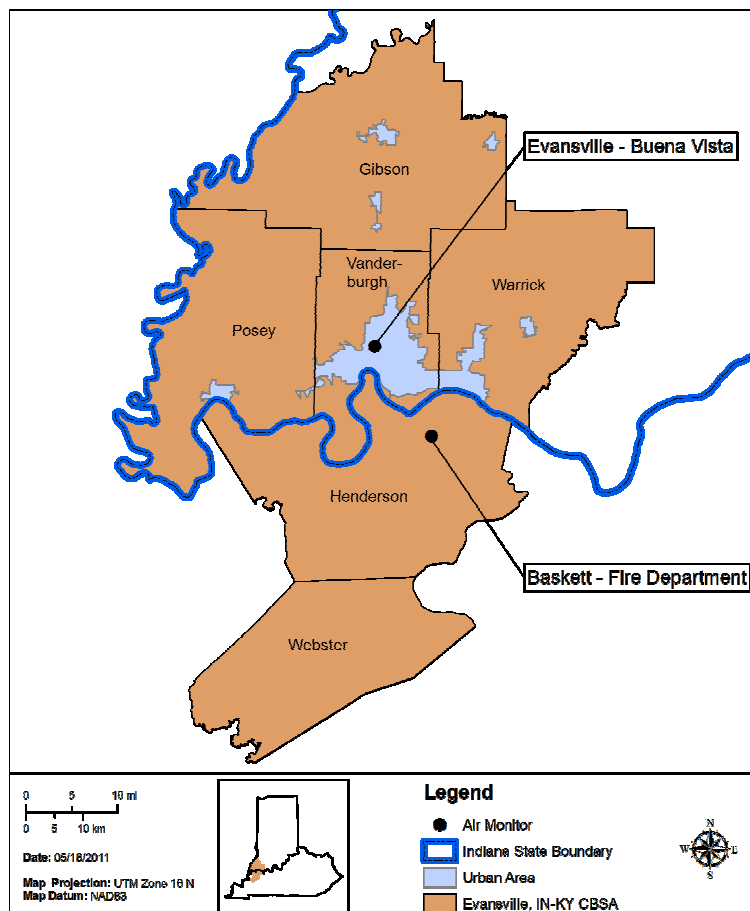
The Evansville CBSA includes the city of Evansville in Vanderburgh County and the surrounding Indiana counties of Gibson, Posey, and Warrick. It also includes the city of Henderson in Henderson County, KY plus Webster County, KY. The population of the area determined from the 2010 Census is 358,676. According to the 2008 NEI there were 115,815 tons of SO₂ emitted from point, area, and mobile sources. This yields a PWEI of 41,540 million persons-tpy for the area. One site is required.

IDEM operates one site, Evansville – Buena Vista in Evansville. It is located in the urban area in the northern part of the city of Evansville and is considered a population exposure site. One site is operated

by KDEP in Baskett in Henderson County. The map in Figure C4 shows the location of the monitoring sites in the Evansville CBSA. More detailed information for the Indiana site is presented in Table 20 of the SO₂ section in the Indiana 2012 Ambient Air Monitoring Network Plan.

Figure C4 – SO₂ Sites Evansville CBSA

Evansville, IN-KY Core Based Statistical Area



Evansville – Buena Vista meets the criteria for SO₂ network design in 40 CFR Part 58 Appendix D 4.4 Sulfur Dioxide (SO₂) Design Criteria. It will be considered the monitoring network for the Evansville CBSA. No new sites are needed.

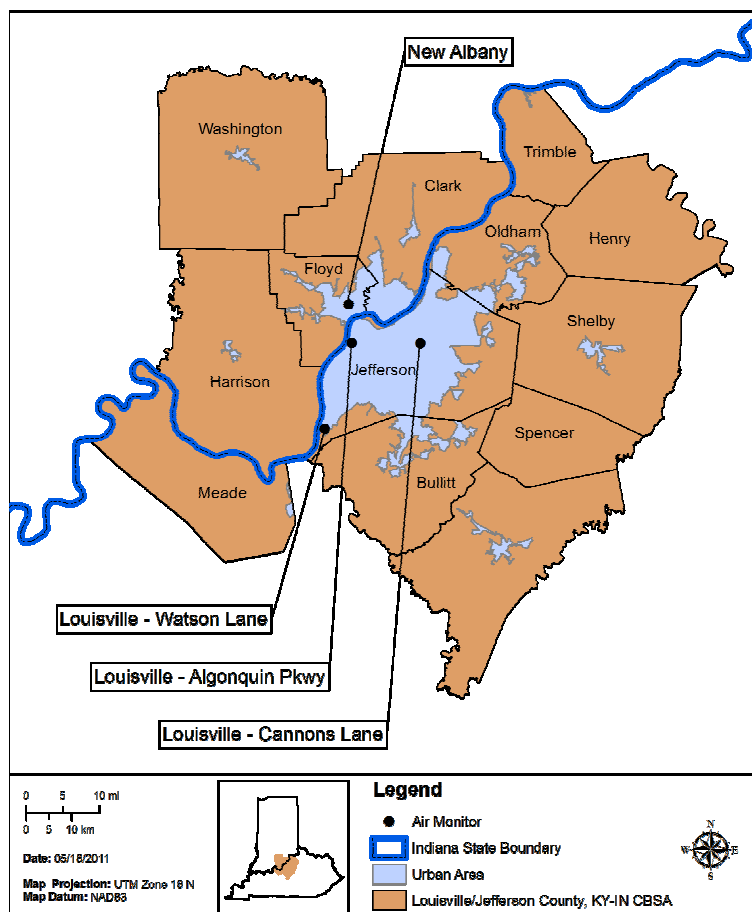
Louisville/Jefferson County

The Louisville/Jefferson County CBSA consists of counties in both Indiana and Kentucky. Louisville in Jefferson County, KY is the largest city in the CBSA. Jeffersonville and Clarksville in Clark County and New Albany in Floyd County comprise Indiana's portion of the urban area. Other Indiana counties include Harrison and Washington. The other Kentucky counties include Bullitt, Henry, Meade, Nelson, Oldham, Shelby, Spencer, and Trimble. The population of the area determined from the 2010 Census is 1,283,566. According to the 2008 NEI there were 84,635 tons of SO₂ emitted from point, area, and mobile sources. This yields a PWEI of 108,635 million persons-tpy for the area. Two sites are required.

IDEM operates one SLAMS site in New Albany on Green Valley Road. It is located in the urban area in the northern part of the city of New Albany and is considered a population exposure site. Readings at this site are also influenced by the Duke Energy Indiana – Gallagher Generating Station located 5 km to the south. Three sites collect SO₂ air quality in the city of Louisville; the SLAMS sites at Watson Lane and Algonquin Parkway and the NCore site at Cannons Lane. The map in Figure C5 shows the location of the monitoring site in the Louisville/Jefferson County CBSA. More detailed information for the Indiana site is presented in Table 20 of the SO₂ section in the Indiana 2012 Ambient Air Monitoring Network Plan.

Figure C5 – SO₂ Sites Louisville/Jefferson CBSA

Louisville/Jefferson County, KY-IN



The New Albany site meets the criteria for SO₂ network design in 40 CFR Part 58 Appendix D 4.4 Sulfur Dioxide (SO₂) Design Criteria. It will be considered part of the monitoring network for the Louisville/Jefferson County CBSA. The three sites located in Louisville will be considered part of the network also. According to 2.(e) of Appendix D, the full requirements of the network may fall on each state in the absence of an agreement defining the networks between the affected states. Indiana had submitted a proposed agreement to APCD in 2010, but did not get final signature from them. As no final agreement exists and as the majority of the population resides in Kentucky's portion of the CBSA, Indiana believes that one site will fulfill its part of the requirement. No new sites are needed.

Cincinnati-Middletown

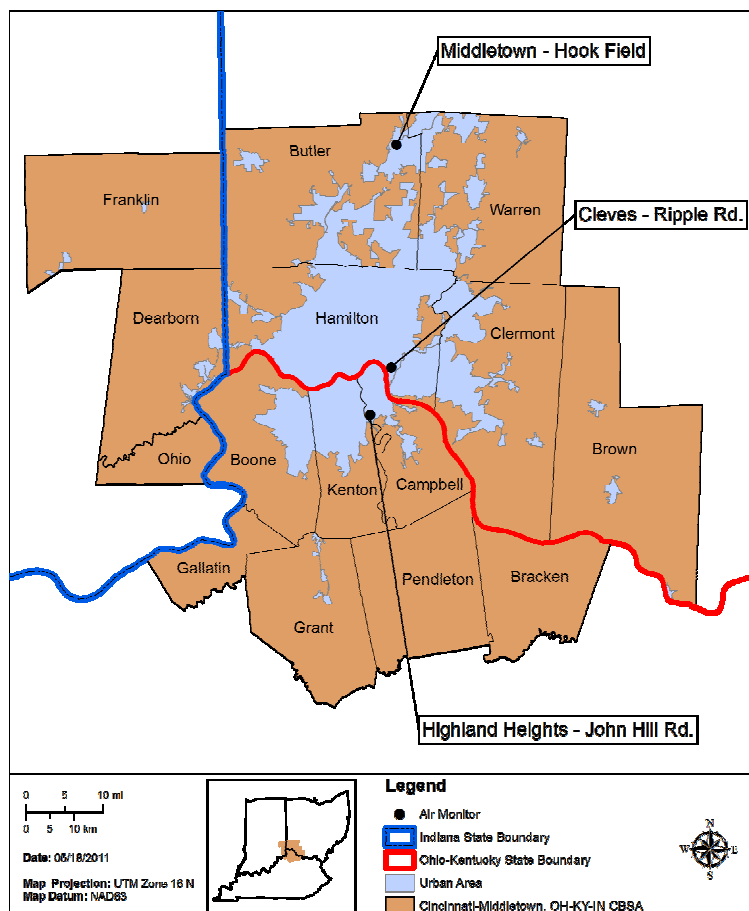
The Cincinnati-Middletown CBSA spans three states; Indiana, Ohio, and Kentucky. Cincinnati in Hamilton County, OH is the largest city in the CBSA and the majority of the population and emissions are located in the entire Ohio portion of the CBSA. Other

counties in Ohio include Brown, Butler, Clermont, and Warren. The Indiana counties are Dearborn, Franklin, and Ohio. The counties in Kentucky are Boone, Bracken, Campbell, Gallatin, Grant, Kenton, and Pendleton. The population of the area determined from the 2010 Census is 2,130,151. According to the 2008 NEI there were 112,644 tons of SO₂ emitted from point, area, and mobile sources. This yields a PWEI of 239,949 million persons-tpy for the area. Two sites are required.

The current network in the CBSA consists of two sites in Ohio, Hook Field in Middletown and Ripple Rd in Cleves, and one site in Kentucky, on John Hill Rd. in Highland Heights. These sites are shown on the map in Figure C6.

Figure C6 – SO₂ Sites Cincinnati-Middletown CBSA

Cincinnati-Middletown, OH-KY-IN Core Based Statistical Area



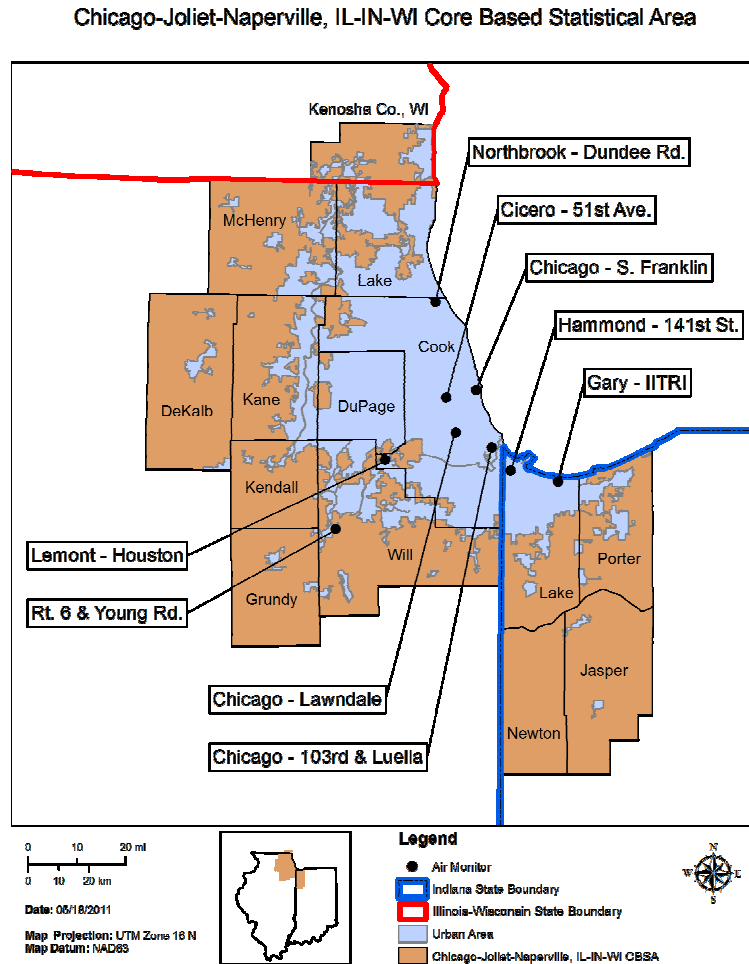
An agreement between IDEM, HCDOS, and KDEP defines the responsibilities of the agencies to maintain the required monitored networks in the CBSA. The three SO₂ sites currently in operation meet the requirements for the area. No new sites are required.

Chicago-Joliet-Naperville

The Chicago-Joliet-Naperville CBSA spans three states; Indiana, Illinois, and Wisconsin. The majority of the population is located in Chicago, IL and its surrounding suburbs. The counties in Illinois are Cook, DeKalb, Grundy, DuPage, Kane, Kendall, McHenry, and Will. The cities of East Chicago, Gary, and Hammond in Lake County are the major cities in Indiana. The CBSA also includes the Indiana counties of Jasper, Newton, and Porter. Kenosha County in Wisconsin is also included. The population of the area determined from the 2010 Census is 9,461,105. According to the 2008 NEI there were 173,256 tons of SO₂ emitted from point, area, and mobile sources. This yields a PWEI of 1,639,193 million persons-tpy for the area. Three sites are required.

Indiana's current network consists of two sites in Indiana at Gary – ITRI and Hammond – 141st St. Seven sites are located in Illinois. More detailed information for the Indiana sites is presented in Table 20 of the SO₂ section in the Indiana 2012 Ambient Air Monitoring Network Plan. The CBSA sites are shown on the map in Figure C7.

Figure C7 – SO₂ Sites Chicago-Joliet-Naperville CBSA



The Gary – IITRI and Hammond – 141st St. sites meet the criteria for SO₂ network design in 40 CFR Part 58 Appendix D 4.4 Sulfur Dioxide (SO₂) Design Criteria. They will be considered part of the monitoring network for the Chicago-Joliet-Naperville CBSA. The seven sites located in Illinois will be considered part of the network also. According to 2.(e) of Appendix D, the full requirements of the network may fall on each state in the absence of an agreement defining the networks between the affected states. Indiana does not have an agreement with Illinois or Wisconsin. As no agreement exists and as the majority of the population resides in Illinois's portion of the CBSA, Indiana believes that its two sites will fulfill its part of the requirement. No new sites are needed.

Current Network

Indiana currently collects SO₂ monitoring data at eight sites across the state. There are seven SLAMS operated by IDEM which have operated for between 14 and 36 years. (Evansville-Buena Vista was established in 2009, but was relocated

approximately 0.5 miles from the original site and is considered a continuation of sampling due to the proximity of the two sites.) The NCore site was established at Indpls – Washington Park in 2010. The current network is summarized in Table C4.

Table C4 - Indiana's Current SO₂ Monitoring Network

Site ID	County	City	Site Name	Monitor Type	Start Date
180431004	Floyd	New Albany	New Albany	SLAMS	11/01/1976
180890022	Lake	Gary	Gary – IITRI	SLAMS	06/12/1997
180892008	Lake	Hammond	Hammond – 141 st St.	SLAMS	08/01/1975
180970057	Marion	Indianapolis	Indpls – Harding St.	SLAMS	03/04/1982
180970073	Marion	Indianapolis	Indpls – E. 16 th St.	SLAMS	04/20/1990
180970078	Marion	Indianapolis	Indpls – Washington Park	NCore	01/01/2010
181630021	Vanderburgh	Evansville	Evansville – Buena Vista	SLAMS	07/08/2009
181670018	Vigo	Terre Haute	Terre Haute – Lafayette Ave.	SLAMS	07/01/1983

Proposed Network

As all eight current monitoring locations are located in the target CBSAs and the sites are located to meet the requirements of the network, Indiana proposes to keep the network as it currently exists. Table C5 provides a summary of the proposed monitoring network for 2012.

Table C5 - Indiana's Proposed SO₂ Monitoring Network

CBSA	States in CBSA	# of Sites per State	Indiana's Sites			# of Sites Required per CBSA	Does CBSA Meet Siting Requirements?
			Site ID	County	City		
Chicago-Naperville-Joliet, IL-IN-WI	Indiana	2	180890033	Lake	Gary	3	Yes ¹
			180892008	Lake	Hammond		
	Illinois	7					
	Wisconsin	0					
Cincinnati-Middleton, OH-KY-IN	Indiana	0				2	Yes ¹
	Ohio	2					
	Kentucky	1					
Louisville-Jefferson County, KY-IN	Indiana	1	180431004	Floyd	New Albany	2	Yes ¹
	Kentucky	3					
Indianapolis-Carmel, IN	Indiana	3	180970057	Marion	Indianapolis	1	Yes
			180970073	Marion	Indianapolis		
			180970078	Marion	Indianapolis		
Evansville, IN-KY	Indiana	1	181630021	Vanderburgh	Evansville	1	Yes ²
	Kentucky	1					
Terre Haute, IN	Indiana	1	181670018	Vigo	Terre Haute	1	Yes
¹ The multi state CBSA meets the minimum requirement when sites from all states are combined. ² The multi state CBSA meets the minimum requirement with Indiana's site only.							

Industrial Monitoring Network

Many industrial SO₂ monitoring sites have operated over the years due to Indiana's "SO₂ Rule." Much of this monitoring began in the mid to later 1970's with most sources operating multiple sites, up to as many as seven around a single facility. As emissions and measured values have decreased over the years the networks have been pared down. The minimum requirements in the rule have been amended and now require only one site per facility. The actual rule is in Title 326 of IAC which contains the Rules of the Air Pollution Control Board. "Rule 3. Ambient Monitoring" of "Article 7. SULFUR DIOXIDE RULES" defines the requirements for sources to conduct ambient SO₂ monitoring:

326 IAC 7-3-1 Applicability

Sec. 1. Sources with total actual emissions of sulfur dioxide greater than ten thousand (10,000) tons per year are subject to the requirements of this rule.

326 IAC 7-3-2 Ambient monitoring

Sec. 2. (a) The source owner or operator shall install and operate continuous ambient sulfur dioxide air quality monitors and a meteorological data acquisition system according to a monitoring plan submitted to the commissioner for approval. At a minimum, the monitoring plan shall contain the following requirements:

- (1) Installation and operation of one (1) or two (2) air quality monitors and one (1) meteorological instrumentation system capable of measuring wind speed and wind direction at a height of at least ten (10) meters above grade. The monitor shall be located in areas of expected maximum ambient concentration as determined by methods acceptable to the commissioner.
- (2) Reporting of the air quality and meteorological data in a format specified by the commissioner within ninety (90) days after the end of each calendar quarter.
- (3) Operation of the air quality monitor and meteorological instrumentation in accordance with a quality assurance program specified by the commissioner.
- (b) A monitoring plan shall be submitted to the department prior to October 1, 1991. The commissioner may require that the monitoring plan be modified, at any time, consistent with the requirements of this section.
- (c) Source owners or operators subject to the requirements of this rule, located in the same county, may submit a joint monitoring plan to satisfy the requirements of this rule. The joint monitoring plan shall specify the responsible owner or operator for each requirement in subsection (a). Upon approval by the commissioner, the joint monitoring plan may contain fewer than two (2) air quality monitors and one (1) meteorological station per owner or operator.
- (d) A source owner or operator may petition the commissioner for an administrative waiver of all or some of the requirements of this section if such owner or operator can demonstrate that ambient monitoring is unnecessary to determine continued maintenance of the sulfur dioxide ambient air quality standards in the vicinity of the source. The demonstration shall address uncertainties in any air quality dispersion models used in the demonstration and shall address the adequacy of any existing monitoring data to characterize the worst-case ambient concentrations in the vicinity of the source. A waiver shall be effective upon written approval by the commissioner. The commissioner may establish conditions in the approval of a waiver to assure compliance with the provisions of this article. Failure to continuously meet the requirements for obtaining a waiver or failure to comply with any condition contained in the approval of a waiver shall render void any waiver issued.

In 2011 there are 13 sites collecting data near coal fired power plants producing electricity in Indiana. Table C6 lists the sites and the facility which they monitor. The emissions reported from the plant in 2008, 2009, and 2010 are also included. There have been decreases in SO₂ emissions from several of the facilities in 2010 when compared to 2008. Duke Energy Indiana – Cayuga, Vectren – AB Brown Generating Station, and Richmond Power and Light – Whitewater Valley have made significant decreases in their SO₂ emissions.

Table C6 – Industrial SO₂ Monitoring Sites in 2011

Site ID	County	CBSA	Facility Monitored	SO ₂ Emissions (tons per year)		
				2008	2009	2010
180270022	Daviess	Washington, IN	Hoosier Energy - Ratts Generating Station & Indianapolis Power and Light - Petersburg Generating Station	27,335 & 22,494	23,948 & 40,129	21,308 & 29,846
181250005	Pike	Jasper, IN				
180430007	Floyd	Louisville/Jefferson County, KY-IN	Duke Energy Indiana - Gallagher	40,438	26,902	23,089
180450001	Fountain		Duke Energy Indiana - Cayuga	50,118	2,423	2,015
180510002	Gibson	Evansville, IN-KY	Duke Energy Indiana - Gibson	20,527	20,942	21,874
171850001	Wabash, IL					
180730002	Jasper	Chicago-Joliet-Naperville, IL-IN-WI	NiSource - R M Schahfer Generating Station	38,759	32,437	27,065
180910005	LaPorte	Chicago-Joliet-Naperville, IL-IN-WI	NiSource - Michigan City Generating Station	11,113	9,430	9,730
181091001	Morgan	Indianapolis-Carmel, IN	Indianapolis Power and Light - Eagle Valley Generating Station	13,086	11,091	12,266
181270011	Porter	Chicago-Joliet-Naperville, IL-IN-WI	NiSource - Bailey Generating Station	8,701	4,903	9,162
181631002	Vanderburgh	Evansville, IN-KY	Vectren - A B Brown Generating Station	10,002	5,778	5,293
181671014	Vigo	Terre Haute, IN	Duke Energy Indiana - Wabash River Generating Station	76,236	51,134	46,208
181770007	Wayne	Richmond, IN	Richmond Power and Light - Whitewater Valley	8,681	3,919	4,806

SO₂ Data

Table C7 presents a summary Indiana's SO₂ monitored data over the last three years as compared to the new 1-hour NAAQS. The data are collected from both the state operated sites and the industrial networks monitoring the individual sources. The value for each year is the 99th percentile value for that site. The 2008-2010 Design Value is the average of the 99th percentile for the three year period. The data are presented on the map in Figure C8.

Attainment Designations

The nine counties that currently have monitors measuring ambient concentrations above the standard are Daviess, Floyd, Fountain, Gibson, Marion, Morgan, Pike, Vigo, and Wayne. On May 11, 2011, Indiana recommended these counties to be classified as nonattainment. Indiana also recommended Vermillion County be classified as nonattainment based upon the contribution of a source(s) in that county to the monitor in Fountain County. The letter and supporting documentation are at http://www.in.gov/idem/files/designation_so2_indiana_prelim.pdf

When USEPA proposes designations in February 2012, Indiana is encouraging them to consider data from the 2009-2011 period. Several sources have implemented more controls in the 2008 to 2010 time

period and the effect of these controls on the 3-year design value does not show up until later in the three year averaging period.

Table C7 – SO₂ Data and Design Values

County	Monitor Site ID	2008	2009	2010	2008-2010 Design Value
Daviess	18-027-0002	122	138	115	125
Floyd	18-043-0004	117	87	72	92
Floyd	18-043-0007 ^	192	68	75	112
Floyd	18-043-1004	138	125	123	129
Fountain	18-045-0001	236	38	26	100
Gibson	18-051-0001 ^	56	44	45	48
Gibson	18-051-0002	90	65	74	76
<i>Wabash, IL</i>	<i>17-185-0001</i>	<i>90</i>	<i>69</i>	<i>66</i>	<i>75</i>
Hendricks	18-063-0002	32	34*		33*
Jasper	18-073-0002	61	88	39	63
Lake	18-089-0022	67	59	57	61
Lake	18-089-2008	37	37	34	36
LaPorte	18-091-0005	29	23	30	27
Marion	18-097-0057	79	75	103	86
Marion	18-097-0073	29	61	48	46
Morgan	18-109-1001	91	98	105	98
Pike	18-125-0005	205	194	211	203
Porter	18-127-0011	82	51	62	65
Vanderburgh	18-163-0012/21	41	17	19	26
Vanderburgh	18-163-1002	43	14	18	25
Vigo	18-167-0018	120	115	61	99
Vigo	18-167-1014	137	142	169	149
Warrick	18-173-0002^	111	38	18	56
Wayne	18-177-0006	109	70	109	96
* Not a complete year of data					
^ Monitor was discontinued at the end of 2010					
Design Value greater than or equal to 76 ppb					
Illinois Monitor					

Figure C8 – SO₂ 1-Hour Design Values (2008 – 2010)

