

Indiana  
2008  
Annual Ambient Air Monitoring  
Network Plan



Indiana Department of Environmental Management  
Office of Air Quality  
December 3, 2007



# Table of Contents

Acronyms.....	6
Introduction .....	7
Indiana's Air Monitoring Network .....	7
Overview of Monitored Parameters .....	7
Criteria Pollutants .....	7
Carbon Monoxide (CO) .....	7
Lead (Pb).....	7
Nitrogen Dioxide (NO <sub>2</sub> ).....	7
Ozone (O <sub>3</sub> ) .....	7
Particulate Matter (PM <sub>10</sub> ).....	8
Fine Particulate Matter (PM <sub>2.5</sub> ).....	8
Sulfur Dioxide (SO <sub>2</sub> ).....	8
Non Criteria Parameters .....	8
PM <sub>2.5</sub> Speciation .....	8
PAMS (Ozone Precursors) .....	8
Toxics / Carbonyls / Metals.....	8
Meteorological Monitoring .....	9
National Ambient Air Quality Standards (NAAQS).....	9
Network Overview.....	10
Review Summary .....	16
Network Description .....	16
Network Review Description.....	17
Monitoring Requirements .....	18
Parameter Networks .....	20
CO.....	20
Monitoring Requirements .....	20
Monitoring Methodology .....	20
Monitoring Network .....	20
Network Modifications .....	20
Lead.....	22
Monitoring Requirements .....	22
Monitoring Methodology .....	22
Monitoring Network .....	22
Network Modifications .....	22
NO <sub>2</sub> .....	23
Monitoring Requirements .....	25
Monitoring Methodology .....	25
Monitoring Network .....	25
Network Modifications .....	25
O <sub>3</sub> .....	27
Monitoring Requirements .....	27
Monitoring Season .....	28
Data.....	28
Monitoring Methodology .....	28
Monitoring Network .....	28
Network Modifications .....	28
PM <sub>10</sub> .....	33
Monitoring Requirements .....	33
Monitoring Methodology .....	33
Monitoring Network .....	33
Network Modifications .....	33
PM <sub>2.5</sub> .....	38

Monitoring Requirements .....	38
Monitoring Methodology .....	38
Monitoring Network .....	39
Data.....	39
Network Modifications .....	40
Unanticipated Network Changes .....	43
SO <sub>2</sub> .....	49
Monitoring Requirements .....	49
Monitoring Methodology .....	49
Network Modifications .....	49
PM 2.5 Speciation.....	52
Monitoring Requirements .....	52
Monitoring Methodology .....	52
Monitoring Network .....	52
Network Modifications .....	52
Ozone Precursors .....	55
Monitoring Requirements .....	55
Monitoring Methodology .....	55
Monitoring Network .....	55
Network Modifications .....	55
Toxics .....	57
Monitoring Requirements .....	57
Monitoring Methodology .....	57
Monitoring Network .....	57
Network Modifications .....	57
Carbonyls .....	60
Monitoring Requirements .....	60
Monitoring Methodology .....	60
Monitoring Network .....	60
Network Modifications .....	60
Metals.....	62
Monitoring Requirements .....	62
Monitoring Methodology .....	62
Monitoring Network .....	62
Network Modifications .....	62
Meteorological .....	64
Monitoring Requirements .....	64
Monitoring Network .....	64
Network Modifications .....	64

## **Appendices**

Appendix A.	
Comments Received Regarding Indiana 2008 Ambient Air Monitoring Annual Network Plan .....	66

## List of Tables

Table 1 - State and Local Air Monitoring Network .....	11
Table 2 - CO Monitoring Network .....	21
Table 3 - Lead Monitoring Network .....	24
Table 4 - NOx Monitoring Network .....	26
Table 5 - SLAMS Minimum O3 Monitoring Requirement .....	27
Table 6 - SLAMS O3 Sites Required for Indiana .....	27
Table 7 - O3 Monitoring Network .....	30
Table 8 - PM10 Site Requirements .....	34
Table 9 - PM10 Monitoring Network .....	36
Table 10 - SLAMS Minimum PM2.5 Monitoring Site Requirements.....	38
Table 11 - Number of SLAMS PM2.5 Monitoring Sites Required for Indiana .....	39
Table 12 - Comparison of PM2.5 Monitoring Data (Fort Wayne - Taylor & Fort Wayne - Beacon St.).....	41
Table 13 - Comparison of PM2.5 Monitoring Data (Gary - Ivanhoe, Hammond - Purdue, & Griffith).....	41
Table 14 - Comparison of PM2.5 Monitoring Data (LaPorte - Lake St. & Michigan City - Marsh Sch.).....	41
Table 15 - Comparison of PM2.5 Monitoring Data (IN Dunes Nat'l Lakeshore & Ogden Dunes) .....	42
Table 16 - Comparison of PM2.5 Monitoring Data (S. Bend - LaSalle HS, Nuner Sch., & Shields Dr.) ....	42
Table 17 - FRM Sampling Frequency Changes .....	43
Table 18 - PM2.5 Monitoring Network .....	44
Table 19 - SO2 Monitoring Network .....	51
Table 20 - PM2.5 Speciation Monitoring Network .....	54
Table 21 - Ozone Precursor Monitoring Network .....	56
Table 22 - Toxics Monitoring Network .....	59
Table 23 - Carbonyl Monitoring Network .....	61
Table 24 - Metals Monitoring Network .....	63
Table 25 - Meteorological Monitoring Network .....	65

## List of Figures

Figure 1 - State and Local Air Monitoring Network (2007 and 2008) .....	15
Figure 2 - Indiana MSAs.....	19
Figure 3 - CO Monitoring Network .....	20
Figure 4 - Lead Monitoring Network .....	22
Figure 5 - Lake County Pb Data Comparison .....	23
Figure 6 - NO <sub>2</sub> Monitoring Network .....	25
Figure 7 - O <sub>3</sub> Design Values (2004-2006).....	28
Figure 8 - O <sub>3</sub> Monitoring Network .....	29
Figure 9 - PM <sub>10</sub> Monitoring Network .....	35
Figure 10 - PM <sub>2.5</sub> Site Design Values .....	40
Figure 11 – Comparison of Indianapolis PM <sub>2.5</sub> Annual Averages.....	40
Figure 12 – Comparison of Indianapolis 98 Percentile Values .....	42
Figure 13 - PM <sub>2.5</sub> Monitoring Networks (2007 & 2008).....	48
Figure 14 - SO <sub>2</sub> Monitoring Network .....	49
Figure 15 - Indianapolis SO <sub>2</sub> Annual Averages 1990 – 2006 .....	50
Figure 16 - Indianapolis SO <sub>2</sub> 24-Hour Maximum 1990 – 2006 .....	50
Figure 17 - Indianapolis SO <sub>2</sub> 3-Hour Maximum 1990 – 2006 .....	50
Figure 18 - Speciation Monitoring Network .....	52
Figure 19 - Ozone Precursors Network.....	55
Figure 20 - Toxics Monitoring Network .....	57
Figure 21 - Carbonyl Monitoring Network.....	60
Figure 22 - Metals Monitoring Network .....	62
Figure 23 - Meteorological Monitoring Network .....	64

## Acronyms

AQS	Air Quality System
BAM	Beta Attenuation Monitor
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
ICP/MS	Inductive Coupled Plasma / Mass Spectrometry
IDEM	Indiana Department of Environmental Management
IMPROVE	Interagency Monitoring of Protected Visual Environments
IOES	Indianapolis Office of Environmental Services
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standard
NAMS	National Air Monitoring Station
NATTS	National Air Toxics Trends Station
NCore	National Core multipollutant monitoring stations
NO	Nitric Oxide
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Oxides of Nitrogen
NO <sub>y</sub>	Total Reactive Nitrogen Oxides
NOAA	National Oceanic and Atmospheric Association
O <sub>3</sub>	Ozone
PAMS	Photochemical Assessment Monitoring Station
Pb	Lead
PM <sub>2.5</sub>	Particulate matter with a diameter less than or equal to 2.5 micrometers
PM <sub>10</sub>	Particulate matter with a diameter less than or equal to 10 micrometers
PTFE	Polytetrafluoroethylene
QA	Quality Assurance
SASS	Speciation Air Sampling System
SLAMS	State or Local Air Monitoring Stations
SO <sub>2</sub>	Sulfur Dioxide
SPM	Special Purpose Monitor
STN PM <sub>2.5</sub>	Speciation Trends Network
TSP	Total Suspended Particulate
TEOM	Tapered Element Oscillating Microbalance
USEPA	United States Environmental Protection Agency
UV	Ultraviolet
VOC	Volatile Organic Compounds



## **Introduction**

In October 2006, the USEPA issued final regulations concerning state and local agency ambient air monitoring networks. These regulations require states to submit an annual monitoring network review to the USEPA. 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 2008 season. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to USEPA.

In addition, USEPA Region V provided guidance in what was to be submitted with the first round of a Network Description.

## **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 the USEPA'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, NO<sub>2</sub>, O<sub>3</sub>, particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and SO<sub>2</sub>. Other pollutants which do not have an ambient standard established for them are also monitored; toxics (VOCs), metals, carbonyls, PM<sub>2.5</sub> speciated compounds, and ozone precursors. In addition meteorological data are also collected to support the monitoring and aid in analysis of the data.

## **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 (NO<sub>2</sub>)**

NO<sub>2</sub> 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 (O<sub>3</sub>)**

Ground-level O<sub>3</sub>, 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 (PM<sub>10</sub>)**

Particulate matter with a mean diameter of 10 microns or less and 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<sub>2.5</sub>)**

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 (SO<sub>2</sub>)**

SO<sub>2</sub> 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<sub>2.5</sub> Speciation**

EPA implemented the PM<sub>2.5</sub> chemical speciation monitoring program knowing the chemical composition of the PM<sub>2.5</sub> 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 suspected harmful components of the PM<sub>2.5</sub> mixture. The process consists of using three different types of filters to separate out such specific compounds as: sulfate, nitrate, organic and elemental carbon, and ammonium.

### **PAMS (Ozone Precursors)**

Of the six (6) criteria pollutants, O<sub>3</sub> is the most encompassing. The most prevalent photochemical oxidant and an important contributor to "smog," O<sub>3</sub> 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<sub>x</sub> in the presence of sunlight. There are thousands of sources of VOCs and NO<sub>x</sub> located across the country. To track and control ozone, USEPA 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, the USEPA called for improved monitoring of ozone and its precursors, VOC and NO<sub>x</sub>, to obtain more comprehensive and representative data on ozone air pollution. 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 movements 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, turbulent wind is blowing any pollution generated will be rapidly dispersed into the atmosphere and will result in lower concentrations near the pollution source.

The measurements of wind speed and direction, temperature, humidity, rainfall 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.

## **National Ambient Air Quality Standards (NAAQS)**

NAAQS are identified for the criteria pollutants; CO, lead, NO<sub>2</sub>, O<sub>3</sub>, particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and SO<sub>2</sub>. 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 the USEPA, 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, a city, a county, or an MSA is the level of pollutant concentration when the rules of the NAAQS calculations are applied to that specific pollutant. For example, the O<sub>3</sub> 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 O<sub>3</sub>, then it is an exceedance of the NAAQS and the area defined by that monitor would be classified as 'nonattainment'. If the design value is below the NAAQS then the

area is in 'attainment' of the standard. 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>

## **Network Overview**

Indiana has reviewed its current ambient air quality network and developed a proposed network to be implemented during 2008. Current and possible proposed NAAQS, site redundancy, siting problems, site access concerns, and other identified monitoring issues all contribute to any proposed network revisions.

Indiana's air monitoring network consists of the sites and monitors listed in Table 1. Any planned changes in the network are also identified. Figure 1 is an overview of Indiana's current monitoring network and show the types of changes planned in 2008.

Overall, the number of monitoring locations operated by the State and Local Agencies in Indiana is planned to go from ninety (90) sites to eighty-three (83) sites. The number of monitored parameters or monitoring systems will go from one hundred eighty-three (183) to one hundred sixty-nine (169).

**Table 1 - State and Local Air Monitoring Network**

AQS#	COUNTY	CITY	SITE NAME	SITE ADDRESS	O <sub>3</sub>	SO <sub>2</sub>	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub> (FRM)	PM <sub>2.5</sub> (Cont)	PM <sub>2.5</sub> (SPEC)	LEAD	TOXICS (VOCs)	O <sub>3</sub> 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				Disc	X	X			Disc				X
180030011	Allen	Fort Wayne	Fort Wayne - Career Cntr.	Career Center, 203 E. Douglas St.			X											
180030014	Allen	Fort Wayne	Fort Wayne - Taylor Univ.	Taylor University, 1025 W. Rudisill						Disc								
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
180190008	Clark		Charlestown St. Park	Charlestown State Park, 12500 Highway 62, Charlestown	X													X
180190006	Clark	Jeffersonville	Jeffersonville - Walnut St	PFAU, 719 Walnut St.					X	X								
180350006	Delaware	Muncie	Muncie - Central HS	Muncie Central HS, 810 N. Walnut St.						X								
180350010	Delaware	Albany	Albany	Albany Elem. Sch., 700 W. State St.	X													
180370004	Dubois	Jasper	Jasper - Sport	Jasper Sport Complex, 1401 12th Ave.						X								X
180370005	Dubois	Jasper	Jasper - Golf	Jasper Golf Course, 1729 Jackson St.						X								
180372001	Dubois	Jasper	Jasper - Post Office	Post Office, 206 E. 6th St.					X	X		X						
180390003	Elkhart	Elkhart	Elkhart - Pierre Moran Sch.	Pierre Moran Jr. HS. 200 W. Lusher St.						Relocate		Relocate		Disc				
	Elkhart	Elkhart								Relocation		Relocation						
180390007	Elkhart	Bristol	Bristol	Bristol Elem. Sch. 705 Indiana Ave.	X													
180431004	Floyd	New Albany	New Albany	Green Valley Elem. Sch., 2230 Green Valley Rd.	X	X				X	X							
	Floyd	New Albany												Add				
180550001	Greene		Plummer	2500 S. 275 W	X													
	Gibson									Add								Add
180570005	Hamilton	Noblesville	Noblesville - 10th St.	1685 N. 10th St.	X													
	Hamilton									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						X								

AQS#	COUNTY	CITY	SITE NAME	SITE ADDRESS	O <sub>3</sub>	SO <sub>2</sub>	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub> (FRM)	PM <sub>2.5</sub> (Cont)	PM <sub>2.5</sub> (SPEC)	LEAD	TOXICS (VOCs)	O <sub>3</sub> PREC	CAR- BONYLS	METALS	MET
180890006	Lake	East Chicago	East Chicago - Franklin Sch.	Franklin Elem. Sch, Alder & 142nd St.					X	X								
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		X	X	X	Disc	X
180890023	Lake	East Chicago	East Chicago - Aldis St.	East Chicago Water Treatment Plant, 3330 Aldis St.					X				X	X			Disc	
180890026	Lake	Gary	Gary - Burr St.	25th Ave. and Burr St.						X								
180890027	Lake	Griffith	Griffith	Ready Elementary School, 1345 N. Broad St.						X								
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								
180891003	Lake	Gary	Gary - Ivanhoe Sch.	Ivanhoe Elem. Sch., 5700 W 15th Ave.						Disc								
180892004	Lake	Hammond	Hammond - Purdue	Powers Bldg. Purdue Univ. Calumet, 2200 169th St.						X	X	X						
180892008	Lake	Hammond	Hammond - 141st St.	1300 E. 141st St.	X	X							X	X				X
180892010	Lake	Hammond	Hammond - Clark HS	Clark High School, 1921 Davis St.					X	X								
180892011	Lake	Hammond	Hammond - Superior Engineering	Superior Engineering, 2345 167th St.									Disc					
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 Sch.	400 E. Homer St.						X								
180910012	LaPorte	LaPorte	LaPorte - Lake St.	Water Trmt. Plant, 1119 Lake St.						Disc								
180950009	Madison	Anderson	Anderson - W. 5th St	44 W. 5th St					Disc	Relocate								
	Madison	Anderson	Anderson - Lincoln St.	1229 Lincoln St.						Relocation	Add							
180950010	Madison		Emporia	East Elem. Sch., 893 E. US 36, Pendleton	X													
180970042	Marion	Indianapolis	Indpls - Mann Rd.	8327 Mann Rd.	Disc	Disc			Disc	Disc								
180970043	Marion	Indianapolis	Indpls - West St.	1735 S. West St.					X	X								
180970050	Marion	Indianapolis	Indpls - Ft. Harrison	Ft. Harrison St. Park	X													
180970057	Marion	Indianapolis	Indpls - Harding St.	1321 S. Harding St.	X	X								Disc		Disc	Disc	X
180970063	Marion	Indianapolis	Indpls - Rockville Rd.	7601 Rockville Rd									X					
180970066	Marion	Indianapolis	Indpls - English Ave.	Seal Products. 3302 English Ave.					X	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	X									X
180970076	Marion	Indianapolis	Indpls - Quemetco	230 S. Girls School Rd.									X					
180970078	Marion	Indianapolis	Indpls - Washington Park	Washington Park, 3120 E. 30th St.	Add	Add	Add	Add		X	X	X		X		X	X	Add

AQS#	COUNTY	CITY	SITE NAME	SITE ADDRESS	O <sub>3</sub>	SO <sub>2</sub>	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub> (FRM)	PM <sub>2.5</sub> (Cont)	PM <sub>2.5</sub> (SPEC)	LEAD	TOXICS (VOCs)	O <sub>3</sub> PREC	CAR- BONYLS	METALS	MET
180970079	Marion	Indianapolis	Indpls - E 75th St.	Lawrence North Car. Cntr, 7250 E. 75th St						Disc								
180970081	Marion	Indianapolis	Indpls - W. 18th St	School 90, 3351 W. 18th St.						X	Add							
180970083	Marion	Indianapolis	Indpls - E. Michigan St	School 15, 2302 E. Michigan St.					Disc	X								
180970084	Marion	Indianapolis	Indpls - School 21	School 21, 3815 English Ave.										X				X
180970085	Marion	Indianapolis	Indpls - Stout Field	Stout Field, 2002 S. Holt Rd.										Disc		Disc	Disc	
	Monroe	Bloomington								Add	Add							
181090005	Morgan	Monrovia	Monrovia	Monrovia HS, 135 S Chestnut St	X													
181230009	Perry		Leopold	Perry Central HS, 19856 Old St. Rd 37, Leopold	X													
181270020	Porter	Porter	Dunes Nat'l Lakeshore	IN Dunes Nat'l Lakeshore, 3400 Mineral Springs Rd.						Disc								
181270022	Porter	Burns Harbor	Burns Harbor - East Office	Bethlehem Steel, East Office					Disc									
181270023	Porter	Portage	Portage - Hwy 12	Bethlehem Steel Waste Lagoon, Hwy. 12					X									
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 Wesley St.	X													
181290003	Posey		St. Philips	2027 St. Philips Rd., Evansville	X													X
181410010	St. Joseph		Potato Creek St. Park	Potato Creek St. Park, 25601 St. Rd. 4, N. Liberty	X													
181410014	St. Joseph	South Bend	S. Bend - Nuner Sch.	Nuner Elem. Sch., 2716 Pleasant St.						X								
181410015	St. Joseph	South Bend	S. Bend - Shields Dr.	2335 Shields Dr.	X			X	Disc	X	X							X
181411007	St. Joseph	Granger	Granger	Harris Twnshp Fire Sta, 12481 Anderson Rd.	X													
181412004	St. Joseph	South Bend	S. Bend - LaSalle HS	LaSalle HS, 2701 Elwood St.						Disc								
181450001	Shelby		Fairland	Triton Central HS, 4774 W. 600N, Fairland	X													
181470009	Spencer	Dale	Dale	David Turnham School, Dunn & Locust						X								
181570008	Tippecanoe	Lafayette	Lafayette - Greenbush St.	Cinergy Substation, 3401 Greenbush St.						X	X			Add				
181630006	Vanderburgh	Evansville	Evansville - Civic Center	Civic Center Courts Building					X	X			X					
181630012	Vanderburgh	Evansville	Evansville - Mill Rd.	Fire Station # 17, 425 W. Mill Rd.	X	X		X	X	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				
181630019	Vanderburgh	Evansville	Evansville - Harwood Sch.	Harwood Middle School, 3013 North 1st Ave.			Relocate											
	Vanderburgh	Evansville					Relocation											
181670018	Vigo	Terre Haute	Terre Haute - Lafayette Ave.	961 N. Lafayette Ave.	X	X			X	X	X							

AQS#	COUNTY	CITY	SITE NAME	SITE ADDRESS	O <sub>3</sub>	SO <sub>2</sub>	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub> (FRM)	PM <sub>2.5</sub> (Cont)	PM <sub>2.5</sub> (SPEC)	LEAD	TOXICS (VOCs)	O <sub>3</sub> PREC	CAR- BONYLS	METALS	MET
181670020	Vigo	Terre Haute	Terre Haute - Hulman St.	1600 Hulman St.					Disc									
181670023	Vigo	Terre Haute	Terre Haute - Devaney Sch.	Devaney Elementary School, 1011 S. Brown Ave.						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	2844 Eble Rd., Newburgh	X													Add

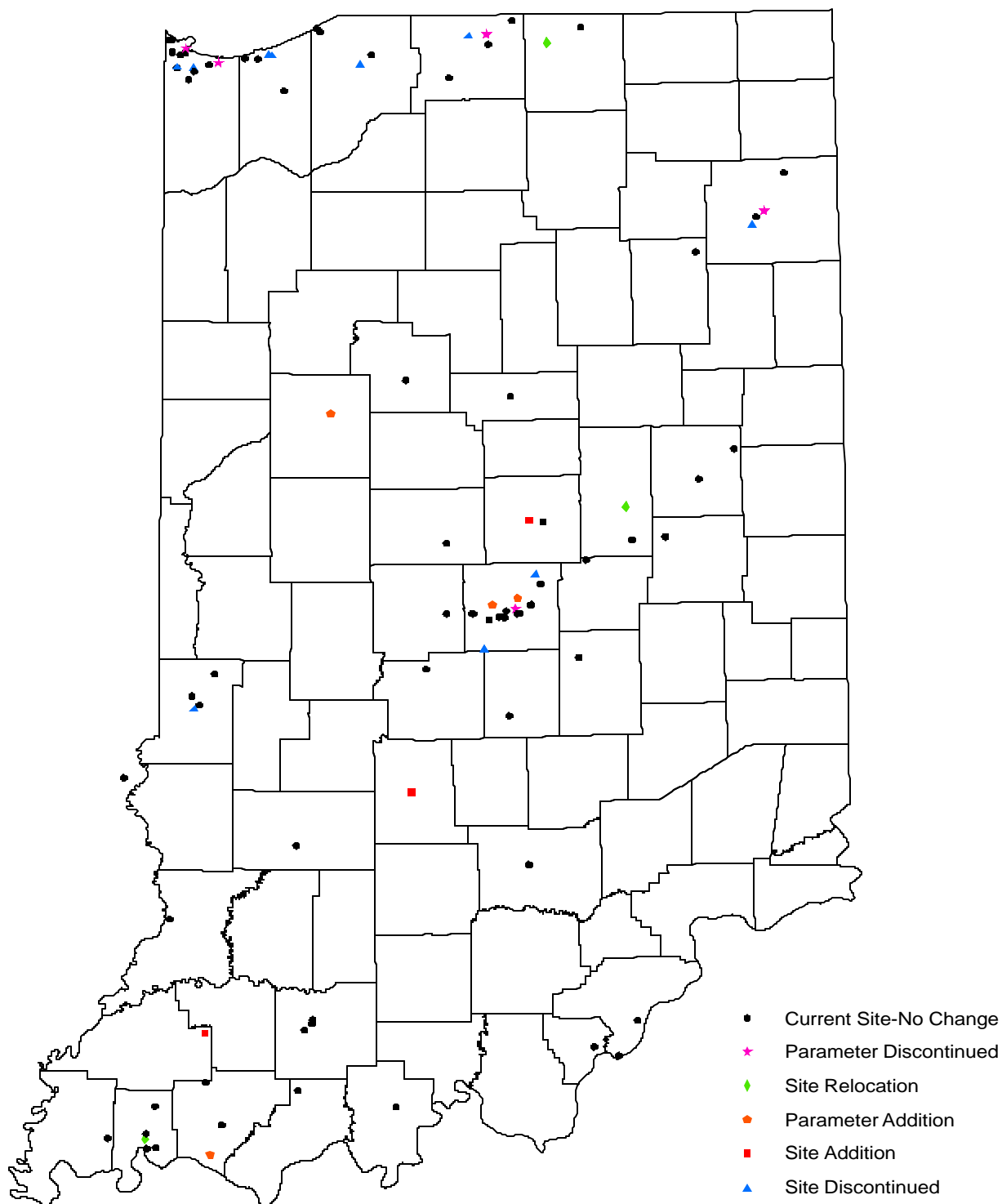
			Number of Parameters													
	Number of Monitoring Sites	Number of Monitored Parameters	O <sub>3</sub>	SO <sub>2</sub>	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub> (FRM)	PM <sub>2.5</sub> (Cont)	PM <sub>2.5</sub> (SPEC)	LEAD	TOXICS (VOCs)	O <sub>3</sub> PREC	CAR- BONYLS	METALS	MET
Current Monitoring Network (2007)	90	183	42	8	5	4	23	42	10	7	6	12	1	4	5	14
Proposed Monitoring Network (2008)	84	171	42	8	6	5	16	38	13	7	5	10	1	2	1	17

Indicates a site where a change is planned



Figure 1 - State and Local Air Monitoring Network (2007 and 2008)

## All Parameters with Changes



## Review Summary

Some of the major network modifications include the following:

With the revocation of the annual PM<sub>10</sub> NAAQS, seven (7) PM<sub>10</sub> monitoring sites will be discontinued.

As more PM<sub>2.5</sub> data are collected across the state and areas are identified with essentially the same concentration, seven (7) PM<sub>2.5</sub> sites have been identified as not necessary and will be discontinued.

New PM<sub>2.5</sub> monitoring sites in Bloomington and Hamilton County will provide information on concentrations in these areas.

Site relocations have been identified due to access problems, or the need to expand monitoring capabilities; Elkhart and Anderson.

Due to siting concerns and low data, Hammond – Superior Engineering lead monitoring will be discontinued.

Two toxics sites will be relocated to other areas of the state to identify any potential health risks in those areas.

Trace level monitoring for CO, SO<sub>2</sub>, and NO<sub>y</sub>, as part of the future NCore requirements, will be initiated at Indianapolis – Washington Park.

Meteorological data will be collected at two additional sites, as part of the future requirement for NCore at Indianapolis – Washington Park, and as the need increases for more met data in SW Indiana, Dayville.

## 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 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<sub>2.5</sub> 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.

## Network Review Description

The following definitions represent the 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<sub>x</sub> 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. The EPA must approve all SLAMS sites.
- ° STN – *PM<sub>2.5</sub> Speciation Trends Network*: A PM<sub>2.5</sub> speciation station designated to be part of the speciation trends network. This network provides chemical species data of fine particulates.
- ° Supplemental Speciation - Any PM<sub>2.5</sub> 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 multipollutant 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 planned and funded for Indiana to be set up in the Indianapolis area.
- ° 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 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 EPA “List of Designated Reference and Equivalent Methods” (see EPA Transfer Technology Network web page at: <http://www.epa.gov/ttn/amtic/files/ambient/criteria/relist030607.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 - ten 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 in the next 18 months; 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.

The placement of a monitoring probe, its spacing from obstructions, and probe materials are outlined in Appendix E of 40 CFR Part 58. The monitors operated in Indiana meet the criteria outlined there.

# Indiana Metropolitan Statistical Areas



## Parameter Networks

### 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 the EPA. Where SLAMS CO monitoring is ongoing, at least one site must be a “maximum concentration” site for that particular area under investigation.

40 CFR Part 58.10 (a)(3) requires NCore monitoring to be operational by January 1, 2011. 40 CFR Part 58 Appendix D, 3.(b) states that CO measurements will be included at the NCore multipollutant monitoring sites.

#### 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 will be used to collect trace level CO data at the NCore Indpls-Washington Park site.

#### Monitoring Network

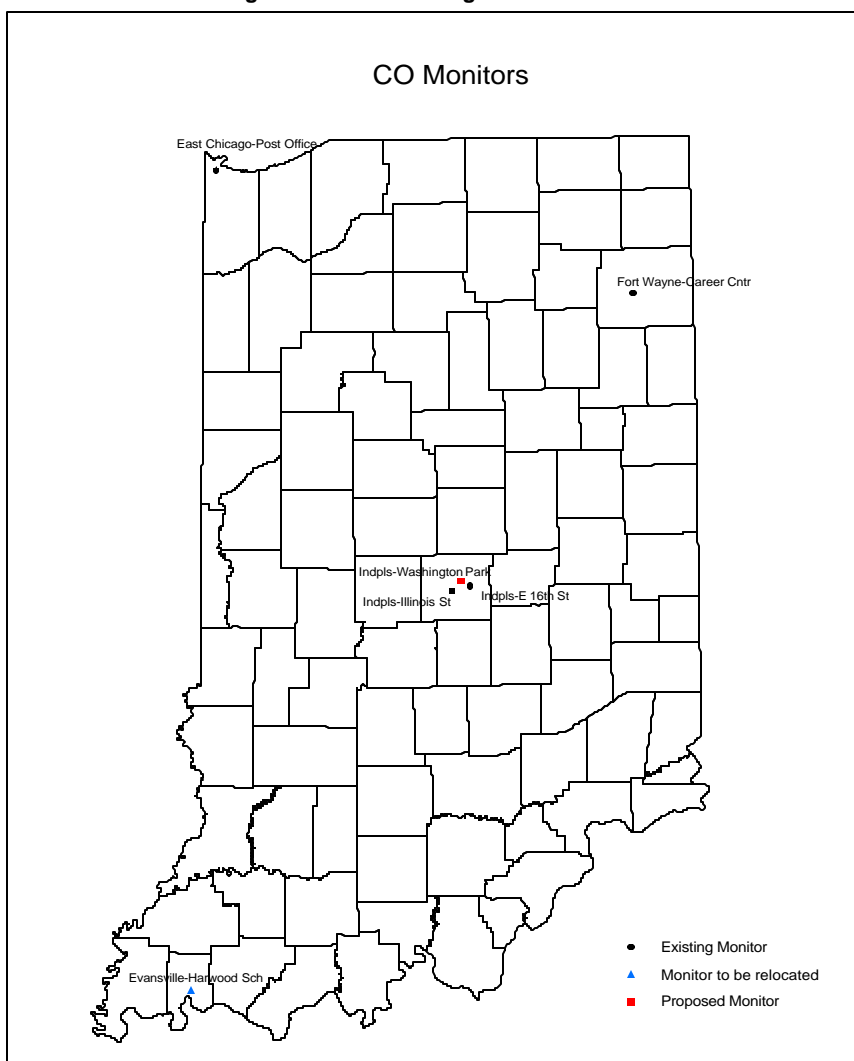
Indiana currently operates five (5) CO monitors located throughout the state. The details of the current network, along with any changes planned in 2008, are listed in Table 2.

#### Network Modifications

Evansville-Harwood School (181630019) will be re-located to a new location, preferably in a higher traffic density area. Problems with the site conditions at the current location also warrant a relocation of this site.

A trace level CO monitor will be added to the Indpls-Washington Park (180970078) proposed NCore monitoring station in 2008.

Figure 3 - CO Monitoring Network



RO: 0520 OPERATING AGENCY: Indiana Department of Environmental Management

CO MONITORING METHOD: 054 - THERMO ELECTRON 48, 48C, 48i  
093 - TELEDYNE INSTR. 300EU

## Lead

### Monitoring Requirements

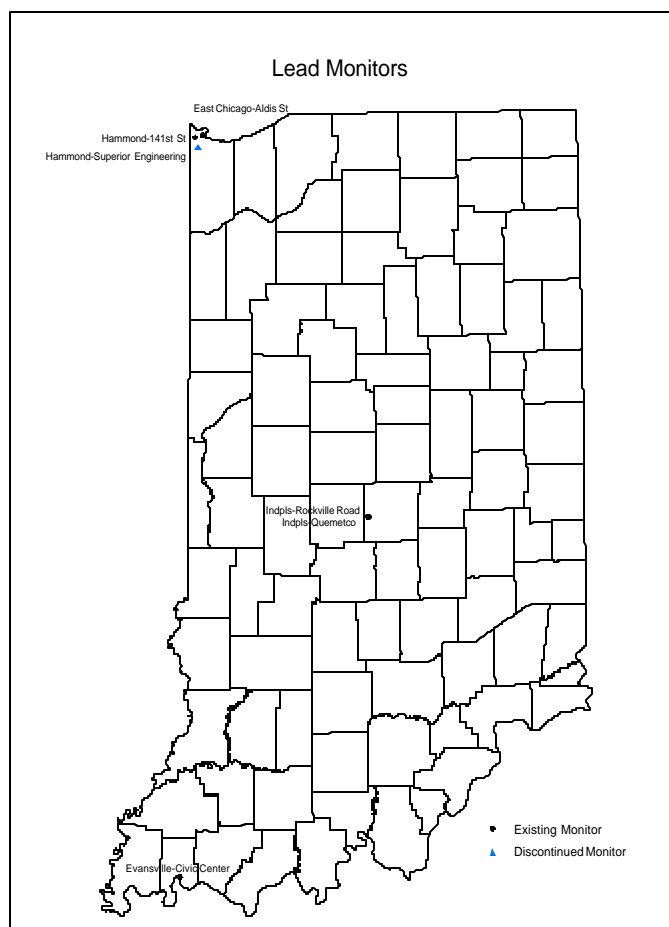
40 CFR Part 58 Appendix D, 4.5 specifies that lead monitoring must be conducted in all areas where lead levels have been shown or are expected to be of concern over the most recent two (2) years. Lead monitoring in Indiana is currently not required.

Collocated samplers are required at 15% of the sites operated by a primary quality assurance organization or a minimum of one (1) per network. Currently two (2) collocated sites are operated.

### Monitoring Methodology

The particulate lead monitoring network utilizes TSP filter sampling with atomic absorption analysis to generate ambient lead concentrations.

**Figure 4 - Lead Monitoring Network**



### Monitoring Network

The lead monitoring network in Indiana currently consists of six (6) sites. In 2008 the network is planned to have five (5) sites. These are detailed in Table 3.

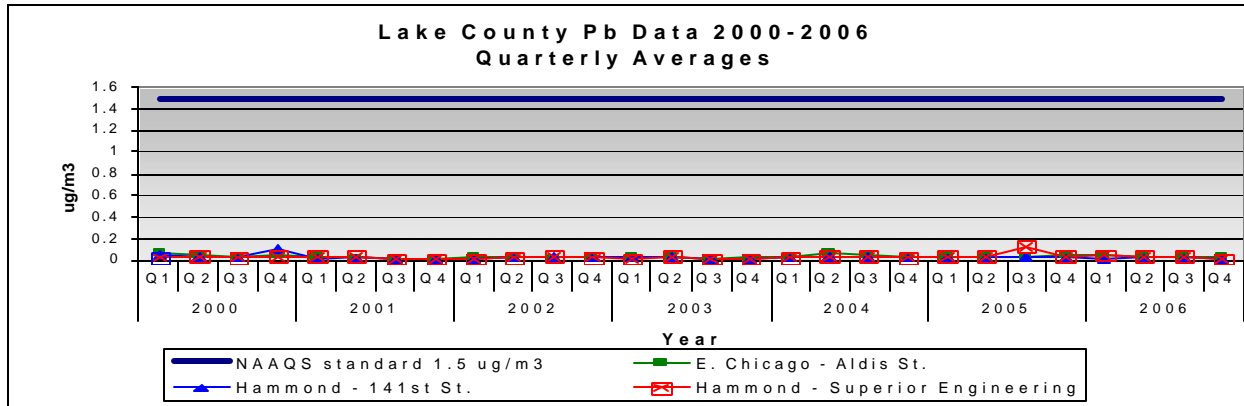
### Network Modifications

Hammond – Superior Engineering (180892011) will be discontinued at the end of 2007. Figure 5 shows that the data collected at Superior Engineering is well below the NAAQS and essentially the same as that collected at East Chicago – Aldis St. (180890023) and Hammond – 141<sup>st</sup> St. (180892008).

The collocated sampler located at Hammond - Superior Engineering will be moved to Hammond – 141<sup>st</sup> St. at the beginning of 2008. This will provide collocated values in two areas of the state.



Figure 5 - Lake County Pb Data Comparison



### Table 3 - Lead 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	MSA	Site Change Proposed?
180890023	East Chicago - Aldis St.	Lake	East Chicago	Water Filtration Plant, 3330 Aldis St.	SLAMS	01/01/97	6-Day	803	Middle	Pop Exp	41.652778	-87.439444	Chicago-Naperville-Joliet, IL	No
180892008	Hammond - 141st St.	Lake	Hammond	1300 E. 141st Street	SLAMS	01/01/77	6-Day	803	Middle	Pop Exp	41.639444	-87.493611	Chicago-Naperville-Joliet, IL	Relocation
180892008	Hammond - 141st St.	Lake	Hammond	1300 E. 141st Street	QA Collocated	01/01/08	6-Day	803	Middle	Quality Assurance	41.639444	-87.493611	Chicago-Naperville-Joliet, IL	Add
180892011	Hammond - Superior Engineering	Lake	Hammond	Superior Engineering, 2345 167th St.	Other	01/01/84	6-Day	803	Middle	Highest Conc	41.592500	-87.471944	Chicago-Naperville-Joliet, IL	Discontinue
180892011	Hammond - Superior Engineering	Lake	Hammond	Superior Engineering, 2345 167th St.	QA Collocated	01/01/87	6-Day	803	Middle	Quality Assurance	41.592500	-87.471944	Chicago-Naperville-Joliet, IL	Relocate
180970063	Indpls - Rockville Road	Marion	Indianapolis	7601 Rockville Road	SLAMS	01/01/84	6-Day	803	Middle	Highest Conc	39.760833	-86.297222	Indianapolis-Carmel	No
180970063	Indpls - Rockville Road	Marion	Indianapolis	7601 Rockville Road	QA Collocated	10/01/00	6-Day	803	Middle	Quality Assurance	39.760833	-86.297222	Indianapolis-Carmel	No
180970076	Indpls - Quemetco	Marion	Indianapolis	230 South Girls School Road	SLAMS	05/06/91	6-Day	803	Middle	Highest Conc	39.758889	-86.289722	Indianapolis-Carmel	No
181630006	Evansville - Civic Center	Vanderburgh	Evansville	Civic Center Courts Bldg, 1 NW ML King Blvd.	Other	01/01/77	6-Day	803	Middle	Pop Exp	37.971667	-87.567222	Evansville, IN-KY	No
MONITORING METHOD: 803 - HI-VOL SAMPLER/ATOMIC ABSORPTION ANALYSIS														

## NO<sub>2</sub>

### Monitoring Requirements

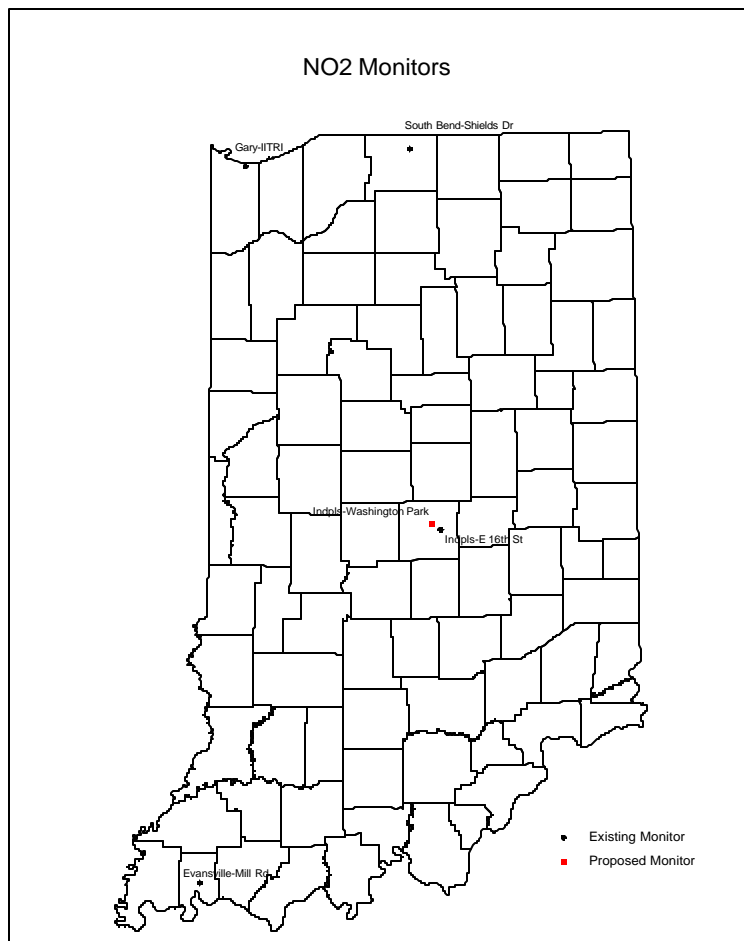
40 CFR Part 58 Appendix D, 4.3 details the requirements for NO<sub>2</sub> monitoring. There are no minimum requirements for the number of NO<sub>2</sub> monitoring sites. Continued operation of current NO<sub>2</sub> SLAMS using FRM or FEM is required until discontinuation is approved by the EPA. If NO<sub>2</sub> monitoring is ongoing, at least one site should be a “maximum concentration” monitoring site.

40 CFR Part 58.10 (a)(3) requires NCore monitoring to be operational by January 1, 2011. 40 CFR Part 58 Appendix D 3.(b) and 40 CFR Part 58 Appendix D, 4.3 state that NO/NO<sub>y</sub> measurements will be included at the NCore multipollutant monitoring sites.

### Monitoring Methodology

The NO/ NO<sub>2</sub>/NO<sub>x</sub> network uses the Thermo Environmental Model 42 C and the 42i chemiluminescence monitors to collect data. The API Model 200EU/501 NO<sub>y</sub> Trace level/Ultra-sensitive analyzer will be used to collect NO/ NO<sub>y</sub> data at the Indpls-Washington Park NCore site.

**Figure 6 - NO<sub>2</sub> Monitoring Network**



### Monitoring Network

Indiana operates four (4) NO<sub>2</sub> monitors located throughout the state. The current network, along with any changes planned in 2008, is listed in Table 4.

### Network Modifications

An NO<sub>y</sub> monitor will be added to the Indpls-Washington Park (180970078) proposed NCore site in 2008. These NO/NO<sub>y</sub> measurements will produce conservative estimates for NO<sub>2</sub> that can be used to ensure tracking of continued compliance with the NO<sub>2</sub> NAAQS. The NO/NO<sub>y</sub> monitors will also collect data on total reactive nitrogen species for better understanding O<sub>3</sub> photochemistry.

### Table 4- NOx 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	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	Proposed Ncore		Continuous	099	Neigh	Pop Exp	39.811097	-86.114469	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
181630012	Evansville - Mill Rd.	Vanderburgh	Evansville	Fire Station #17, 425 W. Mill Rd.	SLAMS	03/01/91	Continuous	074	Neigh	Pop Exp	38.021667	-87.569444	Evansville, IN-KY	No
<div> NOx MONITORING METHOD: 074 - THERMO ELECTRON 42, 42C, 42i  099 - TELEDYNE INSTR. 200EU </div>														

## O<sub>3</sub>

### Monitoring Requirements

Table D-2 in 40CFR Part 58 Appendix D details the number of O<sub>3</sub> sites required in each MSA. The number of sites is based on the population of an MSA and the design value for that area. Table 5 lists the requirements stated in Part 58. Table 6 lists the requirements as they relate to Indiana. There are five (5) MSAs which cross state lines. The number of sites required in each MSA is for the total area, not just Indiana's portion. If all the required sites in the multi-state MSAs were outside of Indiana, then the number of required sites for the state would be eleven (11). If all the required sites in the multi-state MSAs were in Indiana, then the number of required sites would be nineteen (19).

**Table 5 - SLAMS Minimum O<sub>3</sub> Monitoring Requirement**

<b># of Sites Required per Population and Design Value</b>		
<b>MSA Population</b>	<b>3yr Design Value ≥ 85% of NAAQS (0.072 ppm)</b>	<b>3 yr Design Value &lt; 85% of NAAQS (0.072 ppm)</b>
>10 million	4	2
4-10 million	3	1
350,000 - 4 million	2	1
50,000 - 350,000	1	0

**Table 6 - SLAMS O<sub>3</sub> Sites Required for Indiana**

MSA	MSA Population	Design Value (ppm) (2004-2006)	# of Sites Required per CFR	Current No. of Sites	2008 No. of Sites
Anderson	133,358	0.074	1	1	1
Bloomington	175,506	0.076	1	1	1
Chicago-Naperville-Joliet, IL-IN-WI	9,098,316	0.077*	3#	5	5
Cincinnati-Middletown, OH-KY-IN	2,009,632	No Data	2#	0	0
Columbus	71,435	No Data	0	0	0
Elkhart-Goshen	182,791	0.076	1	1	1
Evansville, IN-KY	342,815	0.077*	1#	6	6
Fort Wayne	390,156	0.077	2	2	2
Indianapolis-Carmel	1,525,104	0.079	2	11	11
Jasper	52,511	No Data	0	0	0
Kokomo	101,541	No Data	0	0	0
Lafayette	178,541	0.073	1	1	1
Louisville-Jefferson County, KY -IN	1,161,975	0.077*	2#	2	2
Michigan City-LaPorte	110,106	0.076	1	2	2
Muncie	118,769	0.074	1	1	1
South Bend-Mishawaka, IN-MI	316,663	0.077*	1#	3	3
Terre Haute	170,943	0.073	1	2	2
Non MSA					
Clark, IL		0.066		1	1
Huntington		0.073		1	1
Jackson		0.073		1	1
Perry		0.081		1	1
* Design Value is from Indiana sites					
# Number of sites required for entire MSA					
Min. # of Sites Required for Indiana if all multi-state MSA sites are not in Indiana			11		
Max. # of sites required for Indiana if all multi-state MSA sites are in Indiana			19		
Sites in Indiana Network				42	42

## Monitoring Season

Table D-3 of Appendix D of Part 58 defines the O<sub>3</sub> 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.

## Data

The design value for an area, usually a county or an MSA, is determined by the three (3) year average of the 4<sup>th</sup> highest daily 8-hour maximum. If this value is greater than or equal to 0.085 ppm then the area is considered to be in nonattainment of the NAAQS. If the air quality improves and the design value is below 0.085 ppm then the area may be reclassified as a maintenance area. The design values for all sites for the most recent sampling period (2004 – 2006) along with the current O<sub>3</sub> classifications are on the map in Figure 7.

## Monitoring Methodology

All monitoring sites in Indiana use O<sub>3</sub> analyzers from Thermo Electron, Models 49, 49c, or 49i. These monitors use ultraviolet absorption photometry. Air is drawn through a sample cell where ultraviolet light (254 nm wavelength) passes through it. 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 O<sub>3</sub> monitoring network. According to the number of sites required and the number of sites currently operating, as indicated in Table 6, the Indiana monitoring network more than meets the minimum site requirements. One (1) site is planned to be discontinued in 2008 and one (1) new site is planned to be added to the network. In 2008 the network will remain at forty-two (42) sites. The O<sub>3</sub> monitoring network with the changes proposed for 2008 is in Table 7.

## Network Modifications

Indianapolis – Mann Rd. (180970042) will be discontinued at the end of the 2007 O<sub>3</sub> monitoring season, September 30. Mann Rd. has been considered a background site for Indianapolis. In 1997 two sites, Trafalgar (180810002) and Monrovia (181090005) were established farther upwind of Mann Rd. They now provide background O<sub>3</sub> concentrations.

An O<sub>3</sub> monitor will be added to the Indianapolis – Washington Park (180970078) site in 2008 as part of the O<sub>3</sub> monitoring requirement for the future NCore site.

Figure 7 - O<sub>3</sub> Design Values (2004-2006)

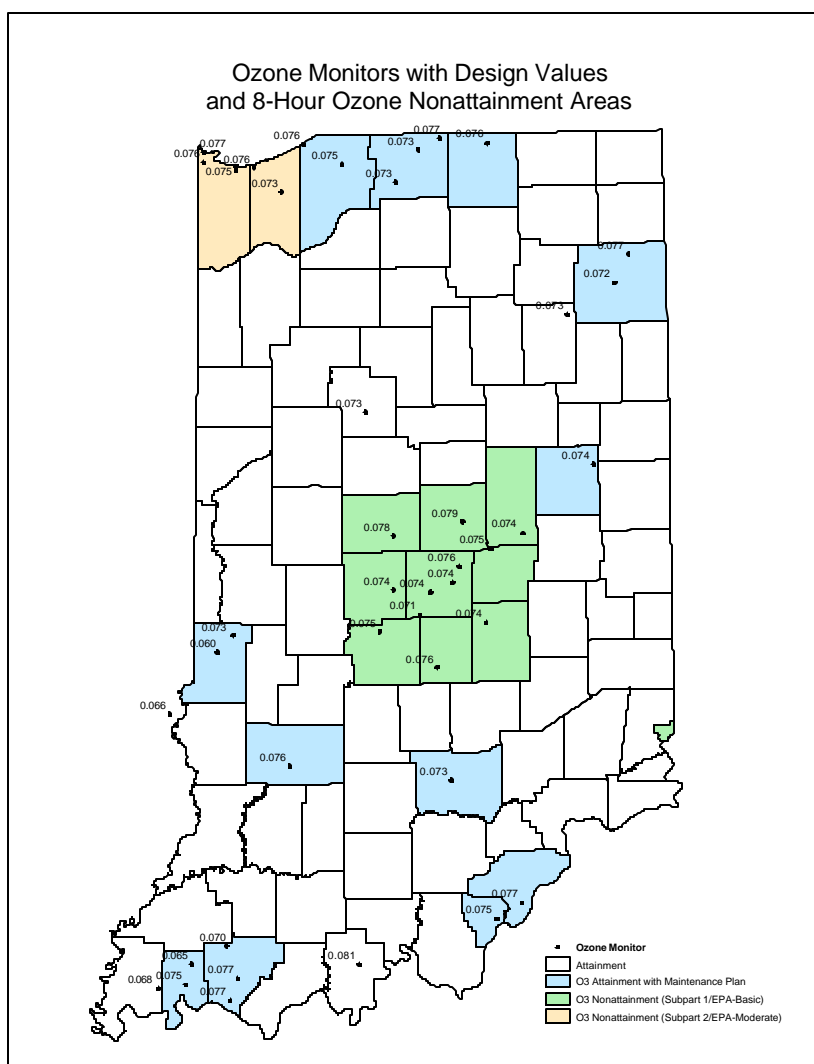


Figure 8 - O3 Monitoring Network

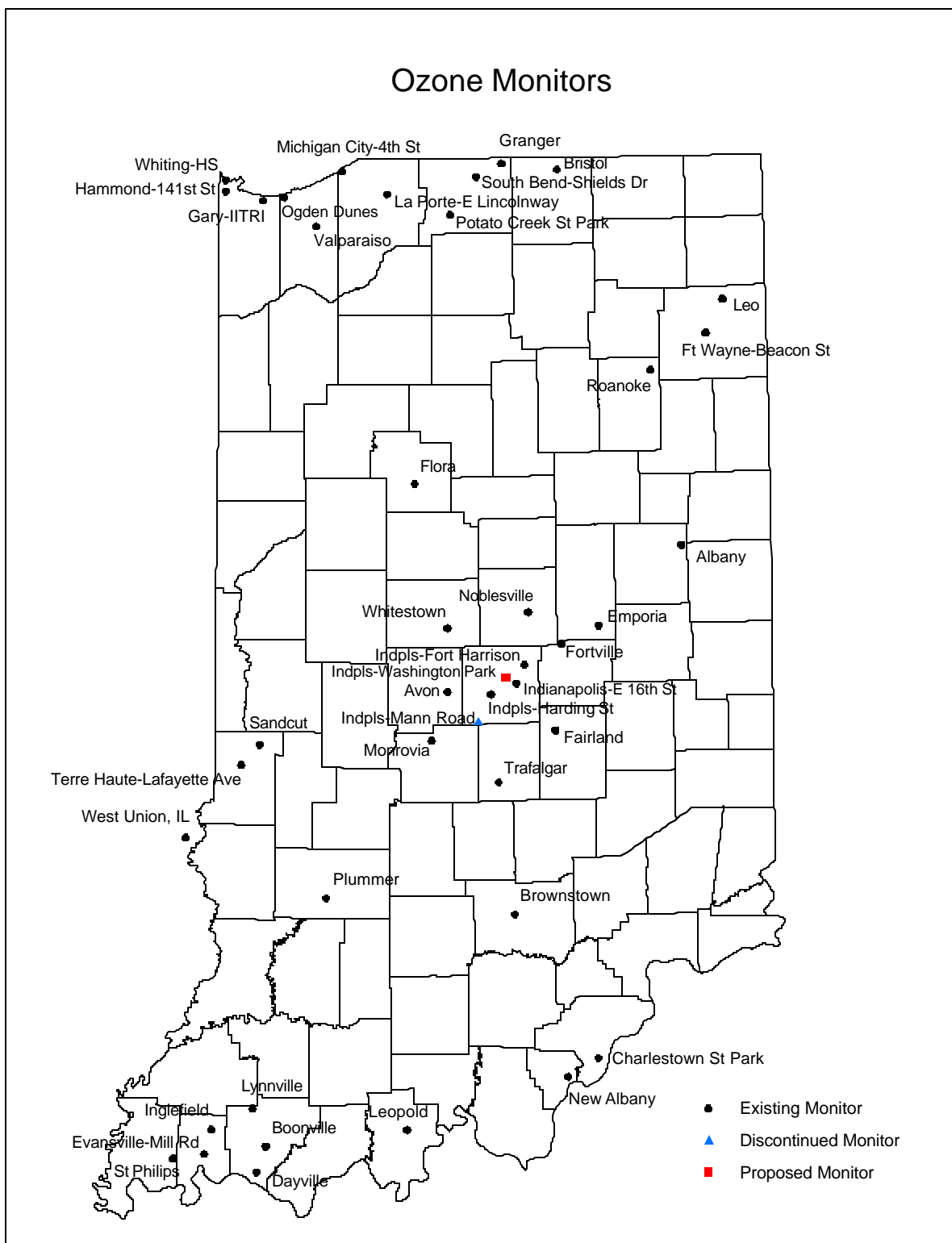


Table 7 - O3 Monitoring Network

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	MSA	Site Change Proposed?
180030002	Leo	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.	NAMS	07/01/79	Continuous	047	Neigh	Pop Exp	41.094722	-85.101944	Ft. Wayne	No
180150002	Flora	Carroll		Flora Airport, 481 S. 150 W., Flora	Other	04/01/01	Continuous	047	Urban	Highest Conc	40.540556	-86.553056	Lafayette	No
180190008	Charlestown St. Park	Clark		Charlestown State Park, 12500 Hwy 62, Charlestown	NAMS	05/04/07	Continuous	047	Urban	Highest Conc	38.394028	-85.664028	Louisville/Jefferson Co.	No
180350010	Albany	Delaware	Albany	Albany Elem. Sch., 706 W. State St.	Special Purpose	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	Pop Exp	38.308056	-85.834167	Louisville/Jefferson Co.	No
180690002	Roanoke	Huntington	Roanoke	Roanoke Elem. Sch., 423 W. Vine St.	SLAMS	04/14/00	Continuous	047	Neigh	Upwind Bkgrd	40.960556	-85.380000	Non-MSA County	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.	Special Purpose	04/01/04	Continuous	047	Urban	Pop Exp	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
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
180970073	Indpls - E. 16th St.	Marion	Indianapolis	6125 E. 16th St.	NAMS	04/02/90	Continuous	047	Neigh	Pop Exp	39.789167	-86.060833	Indianapolis-Carmel	No
181230009	Leopold	Perry		Perry Central HS, 19856 Old St Rd 37, Leopold	Special Purpose	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.	Special Purpose	04/01/98	Continuous	047	Urban	Pop Exp	41.510278	-87.038611	Chicago-Naperville-Joliet, IL	No
181290003	St Philips	Posey		2027 South St. Philips Rd., Evansville	SLAMS	07/01/96	Continuous	047	Urban	Upwind Bkgrd	38.005278	-87.718333	Evansville, IN-KY	No
181410010	Potato Creek St. 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



181630013	Inglefield	Vanderburgh		14940 Old State Road, Evansville	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	961 N. 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	Special Purpose	04/01/01	Continuous	047	Urban	Highest Conc	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		2488 Eble Rd., Newburgh	SLAMS	04/20/05	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	Special Purpose	04/01/01	Continuous	047	Urban	Upwind Bkgrd	39.210883	-87.668416	Non-MSA County	No

**RO: 0523 OPERATING AGENCY: Indianapolis Office of Environmental Services (IOES)**

Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
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
180550001	Plummer	Greene		2500 S. 275 W	Special Purpose	04/03/00	Continuous	047	Regional	Upwind Bkgrd	38.985578	-86.990120	Bloomington	No
180570005	Noblesville	Hamilton	Noblesville	Noblesville Jr HS, 1685 N. 10th St.	SLAMS	04/19/07	Continuous	047	Urban	Highest Conc	40.065194	-86.008061	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
180710001	Brownstown	Jackson		225 W & 300 N, Brownstown	Special Purpose	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
180970042	Indpls - Mann Road	Marion	Indianapolis	8327 Mann Road	SLAMS	10/11/77	Continuous	047	Urban	Pop Exp	39.646254	-86.248784	Indianapolis-Carmel	Discontinue
180970050	Indpls - Ft Harrison	Marion	Indianapolis	Ft. Ben Harrison St Park	NAMS	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
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS	03/07/99	Continuous	047	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	Add
181090005	Monrovia	Morgan	Monrova	Monrovia HS., 135 S. Chestnut St,	SLAMS	04/01/97	Continuous	047	Urban	Pop Exp	39.575596	-86.477914	Indianapolis-Carmel	No
181450001	Fairland	Shelby		Triton Central HS, 4774 W. 600N , Fairland	SLAMS	04/01/00	Continuous	047	Urban	General Bkgrd	39.611293	-85.873582	Indianapolis-Carmel	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?
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
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS	03/07/99	Continuous	047	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	Add
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
181450001	Fairland	Shelby		Triton Central HS, 4774 W. 600N , Fairland	SLAMS	04/01/00	Continuous	047	Urban	General Bkgrd	39.611293	-85.873582	Indianapolis-Carmel	No
<div> O3 MONITORING METHOD: 047 - THERMO ELECTRON 49, 49C, 49i </div>														

## **PM<sub>10</sub>**

### **Monitoring Requirements**

The requirements for the design of the PM<sub>10</sub> monitoring network are listed 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 8 lists the sites required per MSA along with the design value in the proper category for each MSA. The design values are from the Indiana sites only and do not address the values collected in other parts of the multi-state MSAs. Also listed are the number of monitoring sites operated currently and the number proposed to operate in 2008. In an area which requires PM<sub>10</sub> monitoring, if no site is listed or less than the required number of sites is listed in a multi-state MSA, that requirement is addressed by other states listed in the MSA or a combination of sites in Indiana and the other states.

Collocated samplers are required at 15% of the sites operated by a primary quality assurance organization or a minimum of one (1). IDEM is required to operate two (2) sites and IOES, Evansville EPA, and Vigo County Air Pollution Control Department are required one (1) each.

### **Monitoring Methodology**

Intermittent PM<sub>10</sub> samples are collected on a preweighed filter, either an 8" x 10" quartz fiber filter or a 46.2 mm. teflon filter, depending on the sampler. 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 PM<sub>10</sub> 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 23 monitoring sites in the State. Concentration at all sites except for two source oriented sites in Northwest Indiana, Gary – IITRI (180890022) and Portage – Hwy 12 (181270023), are well under 50% of the daily NAAQS of 150 ug/m<sup>3</sup>. Table 9 details the current PM<sub>10</sub> network and the modifications planned for 2008.

### **Network Modifications**

Indiana plans to discontinue seven (7) monitors in 2008. All sites are not required by the CFR and the design values of the sites are well below 50% of the NAAQS. The sites to be discontinued are; Burns Harbor – East Office (181270022), South Bend – Shields Dr. (181410015), Fort Wayne – Beacon St. (180030004), Anderson – W. 5<sup>th</sup> St. (180950009), Indianapolis – E. Michigan St. (180970083), Indianapolis – Mann Rd. (180970042), and Terre Haute – Hulman St. (181670020)

**Table 8 - PM10 Site Requirements**

CFR Requirement	MSA Population		High Conc. <sup>1</sup>	Medium Conc. <sup>2</sup>	Low Conc. <sup>3</sup>		
	> 1,000,000	# of Required Sites ==>	6-10	4-8	2-4		
MSA		Population	MSA Design Value			# of Sites 2007	# of Sites 2008
Chicago-Naperville-Joliet, IL-IN-WI		9,098,316	191 <sup>4</sup>		54 <sup>5</sup>	8	7
Cincinnati-Middletown, OH-KY-IN		2,009,632				0	0
Indianapolis-Carmel		1,525,104			58	6	4
Louisville-Jefferson County, KY-IN		1,161,975			53	1	1

CFR Requirement	MSA Population		High Conc. <sup>1</sup>	Medium Conc. <sup>2</sup>	Low Conc. <sup>3</sup>		
	500,000 - 1,000,000	# of Required Sites ==>	4-8	2-4	1-2		
MSA		Population	MSA Design Value			# of Sites 2007	# of Sites 2008
No MSAs in this category							

CFR Requirement	MSA Population		High Conc. <sup>1</sup>	Medium Conc. <sup>2</sup>	Low Conc. <sup>3</sup>		
	250,000 - 500,000	# of Required Sites ==>	3-4	1-2	0-1		
MSA		Population	MSA Design Value			# of Sites 2007	# of Sites 2008
Evansville, IN-KY		342,815			55	2	2
Fort Wayne		390,156			46	1	0
South Bend-Mishawaka, IN-MI		316,663			66	1	0

CFR Requirement	MSA Population		High Conc. <sup>1</sup>	Medium Conc. <sup>2</sup>	Low Conc. <sup>3</sup>		
	100,000 - 250,000	# of Required Sites ==>	1-2	0-1	0		
MSA		Population	MSA Design Value			# of Sites 2007	# of Sites 2008
Anderson		133,358			40	1	0
Bloomington		175,506				0	0
Elkhart-Goshen		182,791				0	0
Kokomo		101,541				0	0
Lafayette		178,541				0	0
Michigan City-LaPorte		110,106				0	0
Muncie		118,769				0	0
Terre Haute		170,943			50	2	1

Non MSA			Design Value			# of Sites 2007	# of Sites 2008
Jasper					44	1	1

<sup>1</sup> Exceeds NAAQS by 20% (180ug/m3).

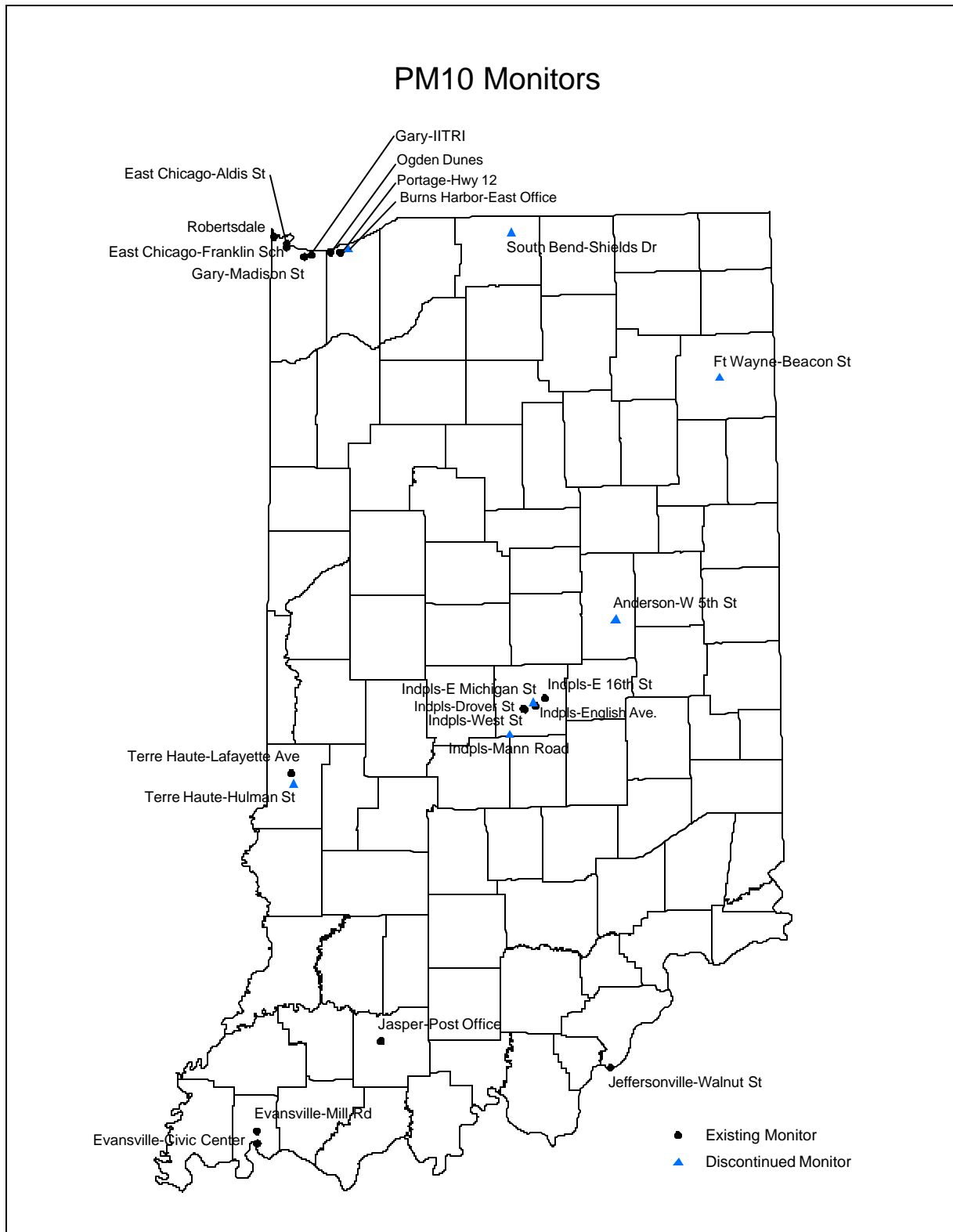
<sup>2</sup> Exceeds 80% of NAAQS (120 ug/m3).

<sup>3</sup> <80% of NAAQS (120 ug/m3).

<sup>4</sup> Design value from source oriented site (not indicative of entire MSA).

<sup>5</sup> Design value from population oriented sites.

Figure 9 - PM10 Monitoring Network



**Table 9 - PM10 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	MSA	Site Change Proposed?
180030004	Ft Wayne - Beacon St.	Allen	Fort Wayne	2022 Beacon St.	SLAMS	11/01/88	6-Day	127	Neigh	Pop Exp	41.094722	-85.101944	Ft. Wayne	Discontinue
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.	SLAMS	10/03/99	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.	QA Collocated	03/01/97	1-Hour	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	062	Middle	Source Oriented	41.652778	-87.439444	Chicago-Naperville-Joliet, IL	No
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	Robertsdale	Lake	Hammond	Clark HS., 1921 Davis St.	SLAMS	10/01/87	6-Day	062	Middle	Pop Exp	41.678333	-87.508333	Chicago-Naperville-Joliet, IL	No
180950009	Anderson - W. 5th St.	Madison	Anderson	Anderson Fire Station, 44 W. 5th St.	SLAMS	02/01/89	6-Day	127	Middle	Pop Exp	40.111944	-85.680000	Anderson	Discontinue
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	No
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	No
181270022	Burns Harbor - East Office	Porter	Burns Harbor	Bethlehem Steel East Office	SLAMS	08/01/87	6-Day	127	Neigh	Highest Conc	41.633333	-87.102778	Chicago-Naperville-Joliet, IL	Discontinue
181270023	Portage - Hwy 12	Porter	Portage	Bethlehem Steel Waste Lagoon, Hwy 12	SLAMS	10/01/95	1-Hour	079	Neigh	Highest Conc	41.616667	-87.145833	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
181410015	South Bend - Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	SLAMS	06/10/06	6-Day	127	Neigh	Pop Exp	41.696692	-86.214683	South Bend-Mishawaka	Discontinue

RO: 0372 OPERATING AGENCY: Evansville EPA

Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
181630006	Evansville - Civic Center	Vanderburgh	Evansville	Civic Center Courts Bldg, 1 NW ML King Blvd.	SLAMS	05/01/88	6-Day	063	Neigh	Pop Exp	37.971667	-87.567222	Evansville, IN-KY	No
181630012	Evansville - Mill Rd.	Vanderburgh	Evansville	Fire Station #17, 425 W. Mill Rd	SLAMS	07/01/03	6-Day	063	Neigh	Pop Exp	38.021667	-87.569444	Evansville, IN-KY	No
181630012	Evansville - Mill Rd.	Vanderburgh	Evansville	Fire Station #17, 425 W. Mill Rd	QA Collocated	07/01/03	6-Day	063	Neigh	Quality Assurance	38.021667	-87.569444	Evansville, IN-KY	No

RO: 1121 OPERATING AGENCY: Vigo County Air Pollution Control Department

181670018	Terre Haute - Lafayette Ave.	Vigo	Terre Haute	961 N. Lafayette Ave.	SLAMS	07/01/88	6-Day	063	Neigh	Pop Exp	39.486111	-87.401389	Terre Haute	No
181670018	Terre Haute - Lafayette Ave.	Vigo	Terre Haute	961 N. Lafayette Ave.	QA Collocated	07/05/99	6-Day	063	Neigh	Quality Assurance	39.486111	-87.401389	Terre Haute	No
181670020	Terre Haute - Hulman St.	Vigo	Terre Haute	1600 Hulman St.	SLAMS	12/07/88	6-Day	064	Middle	Highest Conc	39.448611	-87.391944	Terre Haute	Discontinue

RO: 0523 OPERATING AGENCY: Indianapolis Office of Environmental Services (IOES)

180970042	Indpls - Mann Road	Marion	Indianapolis	8327 Mann Road	SLAMS	10/29/86	6-Day	062	Urban	Pop Exp	39.646254	-86.248784	Indianapolis-Carmel	Discontinue
180970043	Indpls - West St.	Marion	Indianapolis	1735 S. West St.	NAMS	10/29/86	6-Day	062	Middle	Source Oriented	39.744957	-86.166496	Indianapolis-Carmel	No
180970066	Indpls - English Ave.	Marion	Indianapolis	Seal Products Bldg., 3302 English Ave.	NAMS	03/01/87	6-Day	064	Middle	Source Oriented	39.760437	-86.108848	Indianapolis-Carmel	No
180970071	Indpls - Drover St.	Marion	Indianapolis	National Printing Plate, 1415 Drover St.	SLAMS	03/03/87	6-Day	062	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	062	Middle	Quality Assurance	39.747931	-86.175812	Indianapolis-Carmel	No
180970083	Indpls - E. Michigan St.	Marion	Indianapolis	School 15, 2302 E. Michigan St.	SLAMS	11/19/98	6-Day	062	Neigh	Pop Exp	39.774944	-86.122053	Indianapolis-Carmel	Discontinue

PM10 MONITORING METHODS: 062 - WEDDING & ASSOC. HI VOL  
064 - SIERRA-ANDERSEN 321-B  
065 - SIERRA-ANDERSEN 321-C  
079 - R & P TEOM 1400, 1400 A  
127 - R&P 2025A Sequential

## PM<sub>2.5</sub>

### Monitoring Requirements

40CFR Part 58, Appendix D 4.7 details the number of PM<sub>2.5</sub> sites required in each MSA. The number of sites is based on the population of an MSA and the design value for that area. Table 10 (Table D-5 of Appendix D) lists the minimum requirements as stated in Part 58. Table 11 lists the requirements as they relate to Indiana. All of the design values for all the MSAs exceed 85% of either NAAQS with the exception of the annual design value for the Michigan City-LaPorte MSA. There are five (5) MSAs which cross state lines. The number of sites required in each MSA in the table is for the total area, not just Indiana's portion. If all the required sites in the multi-state MSAs were outside of Indiana, then the number of required sites for the state would be fifteen (15). If all the required sites in the multi-state MSAs were in Indiana, then the number of required sites would be twenty-five (25). In the Cincinnati MSA eleven (11) sites are operated in the Ohio and Kentucky portions MSA to satisfy the requirements there. Five (5) sites in the Kentucky portion of the Louisville MSA, along with two (2) sites in Indiana, satisfy the Louisville MSA requirement. The number of sites in Indiana's portion of the Chicago, Evansville, and South Bend MSA exceed the requirements for each entire MSA. The number of sites in Indiana's monitoring network is actually much higher. There are currently forty-two (42) operational sites.

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 of Appendix D" (Table 10). As these requirements are applied to Indiana, between eight (8) and thirteen (13) would be required in the state. Currently, eleven (11) sites operate in Indiana.

Collocated samplers are required at 15% of the FRM/FEM sites operated by each primary quality assurance organization. IDEM is required to have five (5) collocated samplers and IOES is required to operate one (1). This requirement is met.

**Table 10 - SLAMS Minimum PM<sub>2.5</sub> 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 = 29.75 ug/m <sup>3</sup>		
85% of Annual NAAQS = 12.75 ug/m <sup>3</sup>		

### Monitoring Methodology

PM<sub>2.5</sub> is sampled by drawing air through a specially designed inlet that excludes particles larger than 2.5 microns in diameter. The particles are collected on a Teflon™ Microfiber filter that is weighed before and after the sampling period to determine the particulate mass. Indiana uses R&P 2025 Sequential Samplers (FRM) to collect intermittent data. The normal sampling schedule varies, as determined by the regulations: ten (10) sites sample every day, the remainder sample every 3rd day.

Continuous data are collected using either the Met One BAM 1020 or the R&P TEOM 1400a, either with or without the FDMS. 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.

### Monitoring Network

Indiana currently operates forty-two (42) PM<sub>2.5</sub> monitoring sites. All sites have FRMs collecting data for comparison to the NAAQS. Continuous monitors collect data at ten (10) of the site locations. The data from the continuous monitors are used for comparison to the intermittent sampling data, calculation of the AQI, forecasting, and for AIRNow mapping. Speciation monitoring is conducted at seven (7) sites also. This network is addressed in the 'PM<sub>2.5</sub> Speciation' section.

Table 11 - Number of SLAMS PM<sub>2.5</sub> Monitoring Sites Required for Indiana

MSA	MSA Population	Annual Design Value (ug/m3) (2004-2006)	Daily Design Value (ug/m3) (2004-2006)	# of Sites Required per CFR	Current No. of Sites	2008 No. of Sites
Anderson	133,358	13.6	32	1	1	1
Bloomington	175,506	No Data	No Data	0	0	1
Chicago-Naperville-Joliet, IL-IN-WI	9,098,316	14*	38*	3#	10	8
Cincinnati-Middletown, OH-KY-IN	2,009,632	No Data	No Data	3#	0	0
Columbus	71,435	No Data	No Data	0	0	0
Elkhart-Goshen	182,791	13.8	33	1	1	1
Evansville, IN-KY	342,815	14.8	34	1	3	4
Fort Wayne	390,156	13.4	32	1	2	1
Indianapolis-Carmel	1,525,104	15.7	38	3	7	6
Jasper	52,511	15	34	1	3	3
Kokomo	101,541	13.6	31	1	1	1
Lafayette	178,541	13.3	34	1	1	1
Louisville-Jefferson County, KY -IN	1,161,975	16.2*	37*	3#	2	2
Michigan City-LaPorte	110,106	12.5	32	1	2	1
Muncie	118,769	13.5	31	1	1	1
South Bend-Mishawaka, IN-MI	316,663	13*	31*	1#	3	2
Terre Haute	170,943	13.7	34	1	2	2
Non MSAs						
Knox Co. - State Background Site		13.8	36	1	1	1
Henry Co. -State Transport Site		12.9	30	1	1	1
Spencer Co.		13.9	30	0	1	1
		DV >= 85% of NAAQS				
		* Design Value is from Indiana sites				
		# Number of sites required for entire MSA				
Min. # of Sites Required for Indiana if all multi-state MSA sites are not in Indiana				15		
Max. # of sites required for Indiana if all multi-state MSA sites are in Indiana				25		
		Sites in Indiana Network			42	38

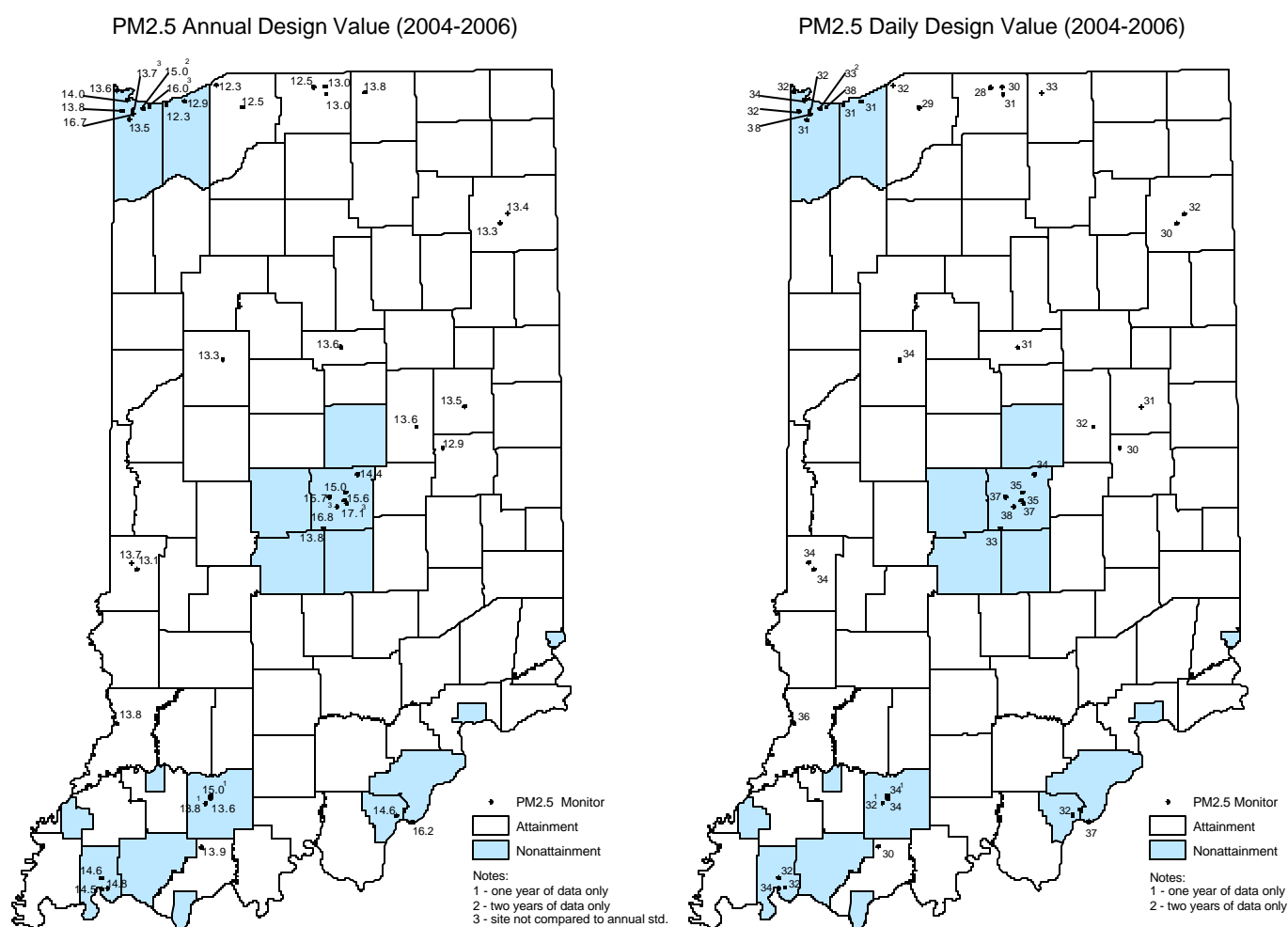
### Data

Only the intermittent data collected from the FRM samplers are eligible for comparison to the NAAQS and used for calculation of the design value for a site.

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 98<sup>th</sup> percentile values from a three (3) year period. This value is then compared to the daily NAAQS, thirty-five (35) to determine attainment/nonattainment of the daily standard. The daily NAAQS was revised from sixty-five (65) to thirty-five (35) in 2006.

The design values for all sites for the most recent sampling period (2004 – 2006) along with the designated nonattainment areas for PM<sub>2.5</sub> are on the map in Figure 10. Note that the nonattainment areas were designated prior to the daily NAAQS change. New designations, based on the new NAAQS, are scheduled to be finalized by December 2008.

**Figure 10 - PM<sub>2.5</sub> Site Design Values**



### Network Modifications

Several modifications to the monitoring network will be made in 2008. The total number of monitoring sites will decrease from forty-two (42) to thirty-eight (38). Two (2) sites will be relocated, seven (7) sites will be discontinued, and three (3) sites will be added to the network. FRM monitoring will continue to be conducted at all sites. The number of continuous monitors is planned to increase from ten (10) to thirteen

(13) in 2008. The number of speciation sampling sites will remain at seven (7). The PM<sub>2.5</sub> monitoring network with the changes proposed for 2008 is in Table 18. Maps comparing the current network and the network proposed for 2008 are in Figure 13.

Fort Wayne – Taylor University (180030014) will be discontinued as the site is duplicative of Fort Wayne – Beacon St. (180030004). Table 12 summarizes the past data.

**Table 12 - Comparison of PM<sub>2.5</sub> Monitoring Data (Fort Wayne - Taylor & Fort Wayne - Beacon St.)**

Site	Annual DV (04-06)	Daily DV (04-06)
Fort Wayne – Taylor Univ	13.3	30
Fort Wayne – Beacon St.	13.4	32
Correlation between sites (2000-2006)		.987

Elkhart – Pierre Moran School (180390003) will be relocated to another site approximately one-half mile south of the current location. Access to the site has been a problem on occasion. Sampling conducted at the new location in 2006 determined that the data correlates well with the existing site.

As the population continues to grow in Hamilton County, to the north and northeast of Indianapolis, it is desired to establish a site located somewhere in the more populated area of this county. No site location has been determined.

The Gary – Ivanhoe School (180891003) site will be discontinued. The data collected at this site is duplicative of the Hammond – Purdue (180892004) site and the Griffith (180890027) site. Table 13 summarizes the data from the three sites.

**Table 13 - Comparison of PM<sub>2.5</sub> Monitoring Data (Gary - Ivanhoe, Hammond - Purdue, & Griffith)**

Site	Annual DV (04-06)	Daily DV (04-06)
Gary – Ivanhoe School	13.7	32
Hammond – Purdue	13.8	32
Griffith	13.5	31
Correlation between Ivanhoe and Purdue (1999-2006)		0.963
Correlation between Ivanhoe and Griffith (2000-2006)		0.980

The LaPorte – Lake St. (180910012) site will be discontinued as the data collected at this site is duplicative of the Michigan City – Marsh Sch. (180910011) site. LaPorte has a slightly higher annual design value, still well under the standard, but a lower daily design value. A summary of the data is in Table 14.

**Table 14 - Comparison of PM<sub>2.5</sub> Monitoring Data (LaPorte- Lake St. & Michigan City - Marsh Sch.)**

Site	Annual DV (04-06)	Daily DV (04-06)
LaPorte – Lake St.	12.5	29
Michigan City – Marsh Sch.	12.3	32
Correlation between sites (2000-2006)		.971

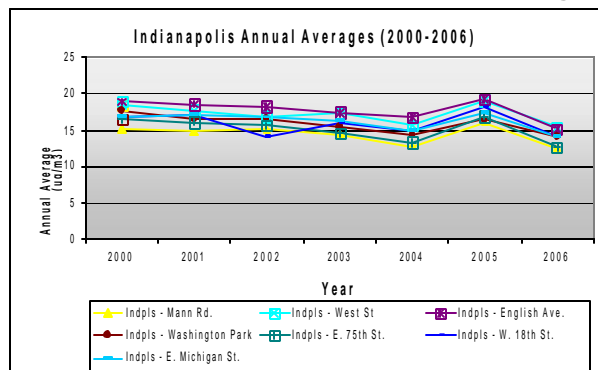
The Anderson – W. 5<sup>th</sup> St. (180950009) site will be relocated from its current location to 1229 Lincoln St. A continuous PM<sub>2.5</sub> monitor will be added to this site. The new location will be able to accommodate a shelter in which to house the continuous monitor.

The Indianapolis – Mann Rd. (180970042) site will be discontinued. This site was originally set up as a background site for the Indianapolis area. It has been consistently lower than the other sites in the city.

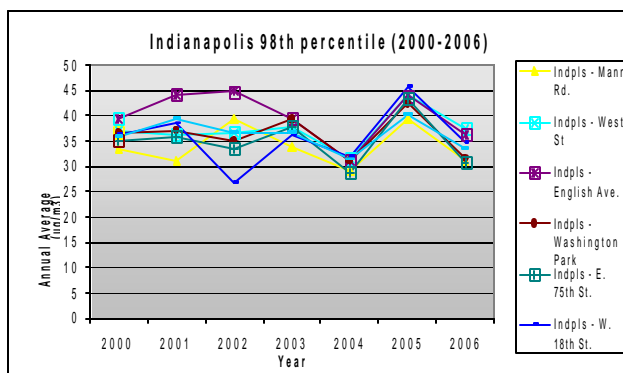
The Indianapolis – 75<sup>th</sup> St. site will be discontinued. The values collected at this site are generally lower than the remainder of the sites in more urbanized area of Indianapolis. The site proposed for Hamilton County will replace this site. The new site will be farther to the northeast of the city.

Figures 11 and 12 show a comparison of the annual averages and the 98<sup>th</sup> percentile value for the Indianapolis sites from 2000 to 2006.

**Figure 11 –  
Comparison of Indianapolis PM2.5 Annual Averages**



**Figure 12 –  
Comparison of Indianapolis 98th percentile Values**



The Indiana Dunes National Lakeshore (181270020) site will be discontinued. This site is duplicative of the Ogden Dunes (181270024) site. The design value at Ogden Dunes is slightly higher than the Lakeshore site. A summary of the data is in Table 15.

**Table 15 - Comparison of PM2.5 Monitoring Data (IN Dunes Nat'l Lakeshore & Ogden Dunes)**

Site	Annual DV (04-06)	Daily DV (04-06)
IN Dunes Nat'l Lakeshore	12.3	31
Ogden Dunes	12.9	31
Correlation between sites (1999-2006)		.952

The South Bend – LaSalle HS (181412004) site will be discontinued as the data collected at this site is duplicative of the other two sites in South Bend. A summary of the data is in Table 16.

**Table 16 - Comparison of PM2.5 Monitoring Data (S. Bend - LaSalle HS, Nuner Sch., & Shields Dr.)**

Site	Annual DV (04-06)	Daily DV (04-06)
S. Bend – LaSalle HS	12.5	28
S. Bend – Nuner School	13.0	31
S. Bend – Shields Dr.	13.0	30
Correlation between LaSalle and Nuner (1999-2006)		0.987
Correlation between LaSalle and Shields Dr. (2000-2006)		0.988

As a result of comments received from many citizens in southwest Indiana, a monitoring site will be located in Gibson County near Oakland City. The site would be approximately twenty-two (22) miles west-southwest of Jasper. With Cinergy's Gibson Power Plant to the west and the Toyota Motor Manufacturing, Indiana, Inc. truck plant to the west-southwest, the information gathered at this site would aid in establishing background values for Jasper and in defining the PM<sub>2.5</sub> concentrations monitored at

Jasper. It would also provide a baseline of PM<sub>2.5</sub> concentrations in anticipation of future industrial and transportation expansion.

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. Ten (10) sites initiated daily sampling at the beginning of 2007. A review of the 2004 – 2006 data indicates that only four (4) of the sites would be required to operate on an everyday sampling schedule. The preliminary design values were also calculated using data from 2005 through the first three (3) quarters of 2007, to determine if this trend will continue. The updated data indicate that five (5) of the sites would return to 1/3 day sampling. Table 17 indicates which sites would return to 1/3 day sampling beginning on 1/1/2008.

**Table 17 - FRM Sampling Frequency Changes**

<b>Site</b>	<b>Unrounded Design Value</b>			<b>Site to revert to 1/3 sampling in 2008</b>
	<b>03-05</b>	<b>04-06</b>	<b>05-07</b>	
Fort Wayne - Beacon St	34.67	31.87	32.76	X
Jeffersonville - Walnut St	38.10	36.60	40.03	
Muncie - Central HS	33.67	30.63	32.70	X
Jasper - Post Office	36.90	34.27	36.73	
Elkhart - Prairie St.	36.30	32.57	33.03	X
Michigan City - Marsh School	33.63	31.53	31.07	X
Anderson	34.00	31.50	33.80	
SB - Nuner School	33.97	30.97	32.73	X
Lafayette - Greenbush St.	36.73	34.23	36.33	
Terre Haute Devaney School	35.10	34.00	34.73	
+/-5% of NAAQS = 33.25 ug/m3 to 36.75 ug/m3				

#### **Unanticipated Network Changes**

Since Indiana has not opted to spatially average PM<sub>2.5</sub> 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<sub>2.5</sub>, 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.

**Table 18 - PM2.5 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*	118	Neigh	Pop Exp	41.094722	-85.101944	Yes	Ft. Wayne	No
180030004	Ft Wayne - Beacon St.	Allen	Fort Wayne	2022 North Beacon St.	SLAMS	01/01/02	Continuous	701	Neigh	Pop Exp	41.094722	-85.101944	No	Ft. Wayne	No
180030014	Ft Wayne - Taylor Univ.	Allen	Fort Wayne	Taylor Univ., 1025 Rudisill Blvd.	SLAMS	02/12/00	3-Day	118	Neigh	Pop Exp	41.050556	-85.149722	Yes	Ft. Wayne	Discontinue
180190006	Jeffersonville - Walnut St.	Clark	Jeffersonville	Jeffersonville PFAU, 719 Walnut St.	SLAMS	06/26/03	1-Day	118	Neigh	Pop Exp	38.277675	-85.740153	Yes	Louisville/Jefferson Co.	No
180350006	Muncie - Central HS	Delaware	Muncie	Muncie Central HS, 801 N. Walnut St.	SLAMS	10/15/99	3-Day*	118	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	1-Day	118	Neigh	Pop Exp	38.391389	-86.929167	Yes	Non-MSA County	No
180370004	Jasper - Sport	Dubois	Jasper	Japer Sport Complex , 1401 12th Ave.	Special Purpose	03/01/06	3-Day	118	Neigh	Pop Exp	38.369436	-86.959031	Yes	Non-MSA County	No
180370005	Jasper - Golf	Dubois	Jasper	Jasper Golf Course , 1729 Jackson St.	Special Purpose	01/29/06	3-Day	118	Neigh	Pop Exp	38.404778	-86.928322	Yes	Non-MSA County	No
180390003	Elkhart - Pierre Moran Sch.	Elkhart	Elkhart	Pierre Moran Sch, 200 W. Lusher Ave	SLAMS	05/12/99	1-Day	118	Neigh	Pop Exp	41.667778	-85.969444	Yes	Elkhart-Goshen	Relocate
	Elkhart - Prairie St.	Elkhart	Elkhart	2745 Prairie St.	SLAMS	Proposed 01/01/08	3-Day*	118	Neigh	Pop Exp			Yes	Elkhart-Goshen	Relocation
180431004	New Albany	Floyd	New Albany	Green Valley Elem. Sch., 2230 Green Valley Rd.	SLAMS	01/18/99	3-Day	118	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	118	Neigh	Quality Assurance	38.308056	-85.834167	Yes	Louisville/Jefferson Co.	No
180431004	New Albany	Floyd	New Albany	Green Valley Elem. Sch., 2230 Green Valley Rd.	SLAMS	11/01/03	Continuous	760	Neigh	Pop Exp	38.308056	-85.834167	No	Louisville/Jefferson Co.	No
		Gibson			Special Purpose	Proposed	3-Day	118	Urban	Pop Exp			Yes	Evansville, IN-KY	Add
180650003	Mechanicsburg	Henry		Shenandoah HS, 7354 W. Hwy. 36, Pendleton	SLAMS	09/26/00	3-Day	118	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	118	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	118	Regional	General Background	38.740833	-87.484722	Yes	Non-MSA County	No
180890006	East Chicago- Franklin Sch.	Lake	East Chicago	Franklin School, Alder & 142nd St.	SLAMS	01/27/99	3-Day	118	Neigh	Pop Exp	41.636111	-87.440833	Yes	Chicago-Naperville- Joliet, IL	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	03/04/99	3-Day	118	Middle	Source & Pop Exp	41.606667	-87.304722	Daily**	Chicago-Naperville- Joliet, IL	No
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	SLAMS	01/01/03	Continuous	701	Middle	Source & Pop Exp	41.606667	-87.304722	No	Chicago-Naperville- Joliet, IL	No
180890026	Gary - Burr St	Lake	Gary	Truck Stop, 25th Ave & Burr St.	SLAMS	02/12/00	3-Day	118	Middle	Source & Pop Exp	41.573056	-87.405833	Daily**	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?
180890027	Griffith	Lake	Griffith	Eldon Ready Elem Sch, 1345 N. Broad St.	SLAMS	02/18/00	3-Day	118	Neigh	Pop Exp	41.546667	-87.426389	Yes	Chicago-Naperville- Joliet, IL	No
180890031	Gary - Madison St.	Lake	Gary	Indiana American Water Co., 650 Madison St.	SLAMS	07/01/05	3-Day	118	Neigh	Pop Exp	41.598505	-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	118	Neigh	Quality Assurance	41.598505	-87.342991	Yes	Chicago-Naperville- Joliet, IL	No
180891003	Gary - Ivanhoe Sch	Lake	Gary	Ivanhoe Sch, 5700 W 15th St.	SLAMS	01/27/99	3-Day	118	Neigh	Pop Exp	41.588889	-87.407778	Yes	Chicago-Naperville- Joliet, IL	Discontinue
180892004	Hammond - Purdue	Lake	Hammond	Powers Bldg. Purdue Univ. Calumet, 2200 169th St.	SLAMS	02/11/99	3-Day	118	Neigh	Pop Exp	41.585278	-87.474444	Yes	Chicago-Naperville- Joliet, IL	No
180892004	Hammond - Purdue	Lake	Hammond	Powers Bldg. Purdue Univ. Calumet, 2200 169th St.	SLAMS	12/01/03	Continuous	760	Neigh	Pop Exp	41.585278	-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	118	Neigh	Pop Exp	41.678333	-87.508333	Yes	Chicago-Naperville- Joliet, IL	No
180910011	Michigan City - Marsh Sch.	La Porte	Michigan City	Marsh Elem. Sch., 400 E. Homer St.	SLAMS	12/17/99	3-Day*	118	Neigh	Pop Exp	41.706944	-86.891111	Yes	Michigan City-LaPorte	No
180910012	LaPorte - Lake St.	La Porte	La Porte	LaPorte Water Waste, 1119 Lake St.	SLAMS	02/27/00	3-Day	118	Neigh	Pop Exp	41.602222	-86.730278	Yes	Michigan City-LaPorte	Discontinue
180950009	Anderson - W. 5th St.	Madison	Anderson	Anderson Fire Station, 44 W. 5th St.	SLAMS	03/19/99	1-Day	118	Neigh	Pop Exp	40.111944	-85.680000	Yes	Anderson	Relocate
	Anderson - Lincoln St.	Madison	Anderson	1229 Lincoln St.	SLAMS	Proposed	1-Day	118	Neigh	Pop Exp			Yes	Anderson	Add
	Anderson - Lincoln St.	Madison	Anderson	1229 Lincoln St.	SLAMS	Proposed	Continuous		Neigh	Pop Exp			No	Anderson	Add
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS	07/01/00	Continuous	760	Neigh	Pop Exp	39.811097	-86.114469	Yes	Indianapolis-Carmel	No
	Bloomington	Monroe	Bloomington		SLAMS		3-Day	118	Neigh	Pop Exp			Yes	Bloomington	Add
	Bloomington	Monroe	Bloomington		SLAMS		Continuous		Neigh	Pop Exp			No	Bloomington	Add
181270020	Dunes Nat'l Lakeshore	Porter	Porter	IN Dunes Nat'l Lakeshore, 1100 Mineral Springs Rd.	SLAMS	03/04/99	3-Day	118	Neigh	Pop Exp	41.631389	-87.086944	Yes	Chicago-Naperville- Joliet, IL	Discontinue
181270024	Ogden Dunes	Porter	Ogden Dunes	Water Treatment Plant, 84 Diana Rd	SLAMS	01/27/99	3-Day	118	Neigh	Pop Exp	41.617500	-87.199167	Yes	Chicago-Naperville- Joliet, IL	No
181270024	Ogden Dunes	Porter	Ogden Dunes	Water Treatment Plant, 84 Diana Rd	SLAMS	12/03/03	Continuous	760	Neigh	Pop Exp	41.617500	-87.199167	No	Chicago-Naperville- Joliet, IL	No
181410014	South Bend - Nuner Sch.	St Joseph	South Bend	Nuner Elem Sch, 2716 Pleasant St.	SLAMS	11/20/99	3-Day*	118	Neigh	Pop Exp	41.663333	-86.207778	Yes	South Bend-Mishawaka	No
181410015	South Bend - Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	SLAMS	06/10/06	3-Day	118	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	06/10/06	6-Day	118	Neigh	Quality Assurance	41.696692	-86.214683	Yes	South Bend-Mishawaka	No
181410015	South Bend - Shields Dr.	St Joseph	South Bend	2335 Shields Dr.	SLAMS	06/07/06	Continuous	731	Neigh	Pop Exp	41.696692	-86.214683	No	South Bend-Mishawaka	No

181470009	Dale	Spencer	Dale	David Turnham School, Dunn & Locust	SPM	02/01/00	3-Day	118	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	1-Day	118	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	118	Neigh	Quality Assurance	40.431639	-86.852500	Yes	Lafayette	No
181570008	Lafayette - Greenbush St.	Tippecanoe	Lafayette	Cinergy Substation, 3401 Greenbush St	SLAMS	04/01/05	Continuous	701	Neigh	Pop Exp	40.431639	-86.852500	No	Lafayette	No
181630006	Evansville - Civic Center	Vanderburgh	Evansville	Civic Center Courts Bldg, 1 NW ML King Blvd.	SLAMS	04/15/99	3-Day	118	Neigh	Pop Exp	37.971667	-87.567222	Yes	Evansville, IN-KY	No
181630006	Evansville - Civic Center	Vanderburgh	Evansville	Civic Center Courts Bldg, 1 NW ML King Blvd.	QA Collocated	04/15/99	6-Day	118	Neigh	Quality Assurance	37.971667	-87.567222	Yes	Evansville, IN-KY	No
181630012	Evansville - Mill Rd.	Vanderburgh	Evansville	Fire Station #17, 425 West Mill Rd	SLAMS	04/15/99	3-Day	118	Neigh	Pop Exp	38.021667	-87.569444	Yes	Evansville, IN-KY	No
181630012	Evansville - Mill Rd.	Vanderburgh	Evansville	Fire Station #17, 425 West Mill Rd	SLAMS	10/01/02	Continuous	701	Neigh	Pop Exp	38.021667	-87.569444	No	Evansville, IN-KY	No
181630016	Evansville - U of E	Vanderburgh	Evansville	Carson Center, Walnut St.	SLAMS	06/05/99	3-Day	118	Neigh	Pop Exp	37.974444	-87.532222	Yes	Evansville, IN-KY	No
181670018	Terre Haute - Lafayette Ave.	Vigo	Terre Haute	961 N. Lafayette Ave.	SLAMS	03/19/99	3-Day	118	Neigh	Pop Exp	39.486111	-87.401389	Yes	Terre Haute	No
181670018	Terre Haute - Lafayette Ave.	Vigo	Terre Haute	961 N. Lafayette Ave.	SLAMS	07/02/03	Continuous	731	Neigh	Pop Exp	39.486111	-87.401389	No	Terre Haute	No
181670023	Terre Haute - Devaney	Vigo	Terre Haute	Devaney School, 1011 Brown St.	SLAMS	12/06/99	1-Day	118	Neigh	Pop Exp	39.456111	-87.370556	Yes	Terre Haute	No
* Sample frequency changes from 1 to 3 day (01/01/08)															
RO: 0523 OPERATING AGENCY: Indianapolis Office of Environmental Services (IOES)															
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?
		Hamilton			SLAMS	Proposed	3-Day		Neigh	Pop Exp			Yes	Indianapolis-Carmel	Add
180970042	Indpls - Mann Road	Marion	Indianapolis	8327 Mann Road	SLAMS	09/18/99	3-Day	118	Urban	Upwind Background	39.646254	-86.248784	Yes	Indianapolis-Carmel	Discontinue
180970043	Indpls - West St.	Marion	Indianapolis	1735 South West Street	SLAMS	01/24/99	3-Day	118	Middle	Pop Exp	39.744957	-86.166496	No	Indianapolis-Carmel	No
180970066	Indpls - English Ave.	Marion	Indianapolis	Seal Products Bldg., 3302 English Ave,	SLAMS	01/24/99	3-Day	118	Middle	Pop Exp	39.760437	-86.108848	No	Indianapolis-Carmel	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS	03/07/99	3-Day	118	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	701	Neigh	Pop Exp	39.811097	-86.114469	Yes	Indianapolis-Carmel	No
180970079	Indpls - E. 75th St.	Marion	Indianapolis	Lawrence Career Center, 7250 E. 75th St.	SLAMS	09/18/99	3-Day	118	Neigh	Pop Exp	39.893611	-86.040556	Yes	Indianapolis-Carmel	Discontinue



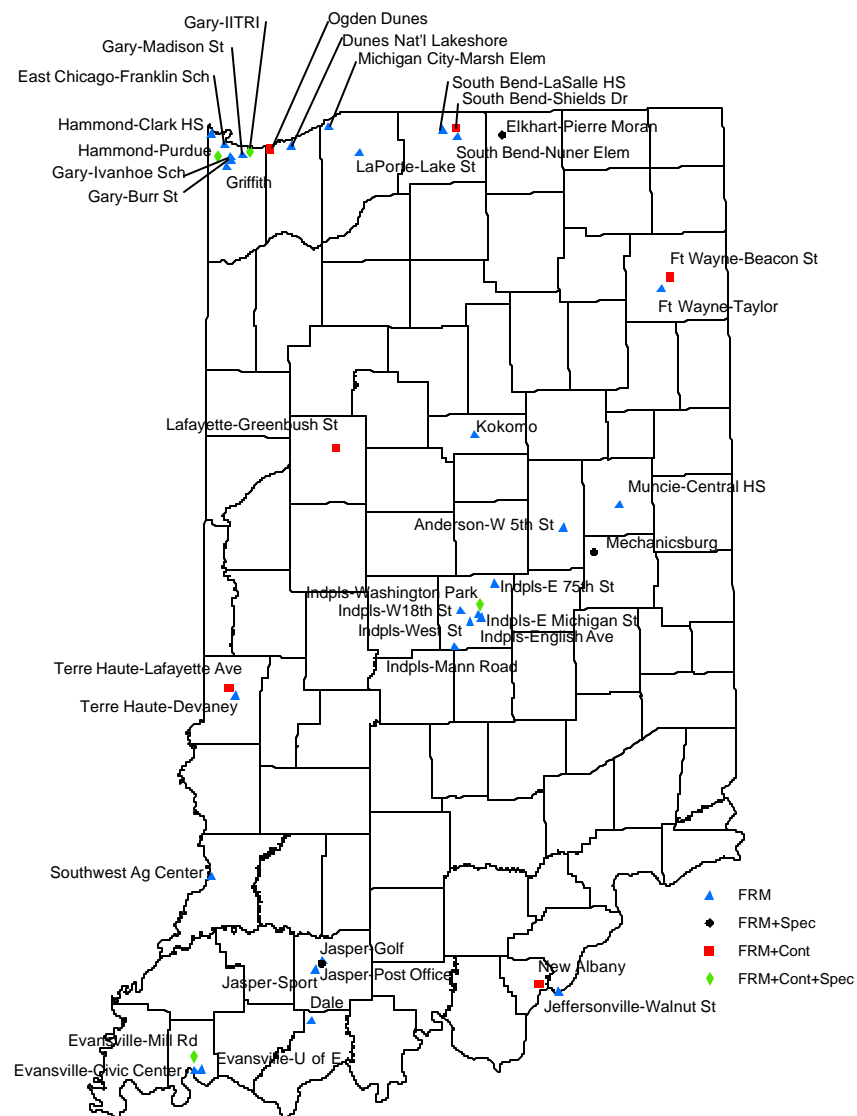
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	NAAQS Comparable**	MSA	Site Change Proposed?
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	SLAMS	01/01/04	Continuous	701	Neigh	Pop Exp	39.811097	-86.114469	No	Indianapolis-Carmel	No
180970079	Indpls - E. 75th St.	Marion	Indianapolis	Lawrence Career Center, 7250 E. 75th St.	SLAMS	09/18/99	3-Day	118	Neigh	Pop Exp	39.893611	-86.040556	Yes	Indianapolis-Carmel	Discontinue
180970081	Indpls - W. 18th St.	Marion	Indianapolis	Ernie Pyle Sch, 3351 W. 18th St.	SLAMS	01/22/99	3-Day	118	Neigh	Pop Exp	39.788903	-86.214628	Yes	Indianapolis-Carmel	No
180970081	Indpls - W. 18th St.	Marion	Indianapolis	Ernie Pyle Sch, 3351 W. 18th St.	QA Collocated	02/11/99	6-Day	118	Neigh	Quality Assurance	39.788903	-86.214628	Yes	Indianapolis-Carmel	No
180970081	Indpls - W. 18th St.	Marion	Indianapolis	Ernie Pyle Sch, 3351 W. 18th St.	SLAMS	02/11/99	Continuous	701	Neigh	Pop Exp	39.788903	-86.214628	No	Indianapolis-Carmel	No
180970083	Indpls - E. Michigan St.	Marion	Indianapolis	Thomas Gregg Sch, 2302 E. Michigan St.	SLAMS	01/22/99	3-Day	118	Neigh	Pop Exp	39.774944	-86.122053	Yes	Indianapolis-Carmel	No

\*\* According to 40 CFR Part 58 Subpart D, PM<sub>2.5</sub> data that is representative of a unique population-oriented scale or localized hot spot are only eligible for comparison to the 24-hour PM<sub>2.5</sub> NAAQS. The annual standard does not apply.

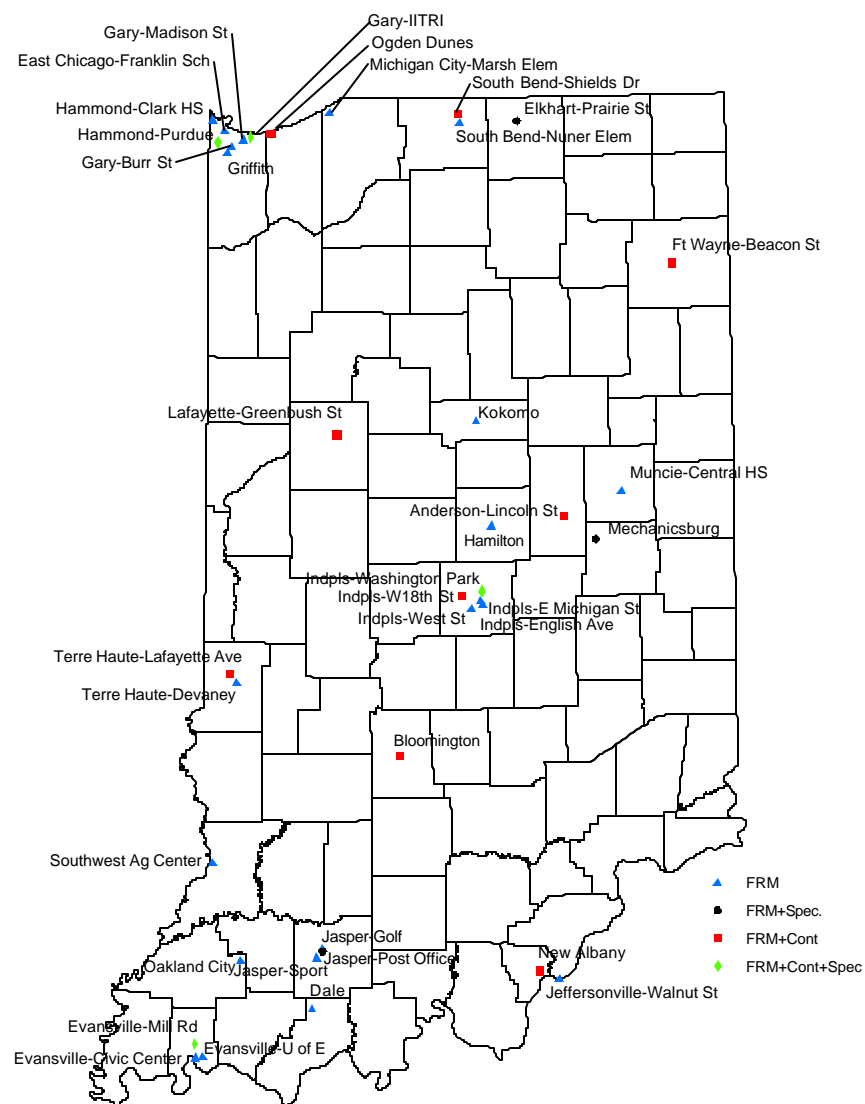
MONITORING METHODS:	118 - R & P 2025	760 - FDMS TEOM
	701- TEOM	731 - MET ONE BAM W/ SCC

Figure 13 - PM2.5 Monitoring Networks (2007 & 2008)

### PM2.5 Monitors - 2007 Network



### PM2.5 Monitors - 2008 Network



## SO<sub>2</sub>

### Monitoring Requirements

40 CFR Part 58 Appendix D, 4.4 details the requirements for SO<sub>2</sub> monitoring. There are no minimum requirements for the number of SO<sub>2</sub> monitoring sites. Continued operation of existing SLAMS SO<sub>2</sub> sites using FRM or FEM is required until discontinuation is approved by the EPA. Since SO<sub>2</sub> monitoring is required in Indiana, at least one site should be a “maximum concentration” station.

40 CFR Part 58.10 (a)(3) requires NCore monitoring to be operational by January 1, 2011. 40 CFR Part 58 Appendix D, 3(b) states that SO<sub>2</sub> measurements will be included at the NCore multipollutant monitoring sites.

### Monitoring Methodology

Indiana's SO<sub>2</sub> monitoring network collects data with Thermo Environmental Models 43A, 43C and 43i using pulsed ultra-violet fluorescence monitoring methodology. The API Model 100EU Trace level/Ultra-sensitive analyzer will be used to collect trace level SO<sub>2</sub> data at the NCore Indpls-Washington Park site.

Figure 14 - SO<sub>2</sub> Monitoring Network



### Monitoring Network

Indiana operates eight (8) SO<sub>2</sub> monitors located throughout the state. The current network, along with any changes planned in 2008, is listed in Table 19.

### Network Modifications

Indpls-Mann Rd. (180970042) will be discontinued due to baseline values and data redundancy from the other two Indianapolis sites, Indpls-E. 16<sup>th</sup> St. (180970073) and Indpls-Harding St. (180970057). Comparisons of the maximum 3-hour and 24-hour values and the annual averages since 1990 are in Figures 15, 16, and 17.

A trace level SO<sub>2</sub> monitor will be added to the Indpls-Washington Park (180970078) proposed NCore monitoring station in 2008.

Figure 15 - Indianapolis SO2 Annual Averages 1990 – 2006

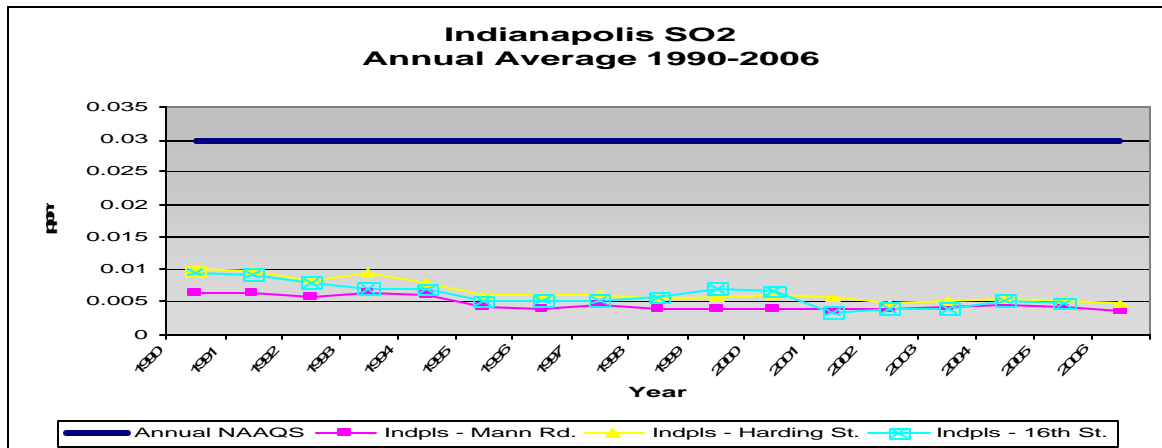


Figure 16 - Indianapolis SO2 24-Hour Maximum 1990 – 2006

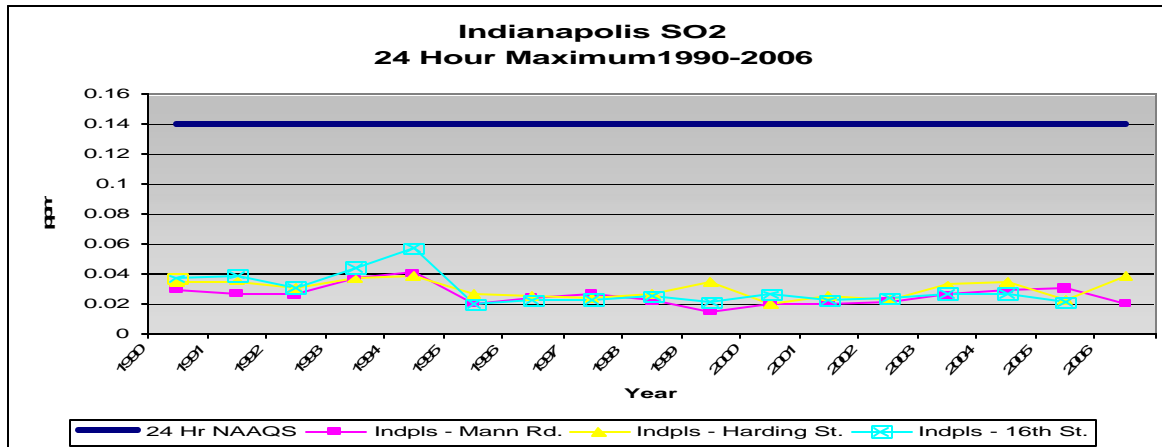
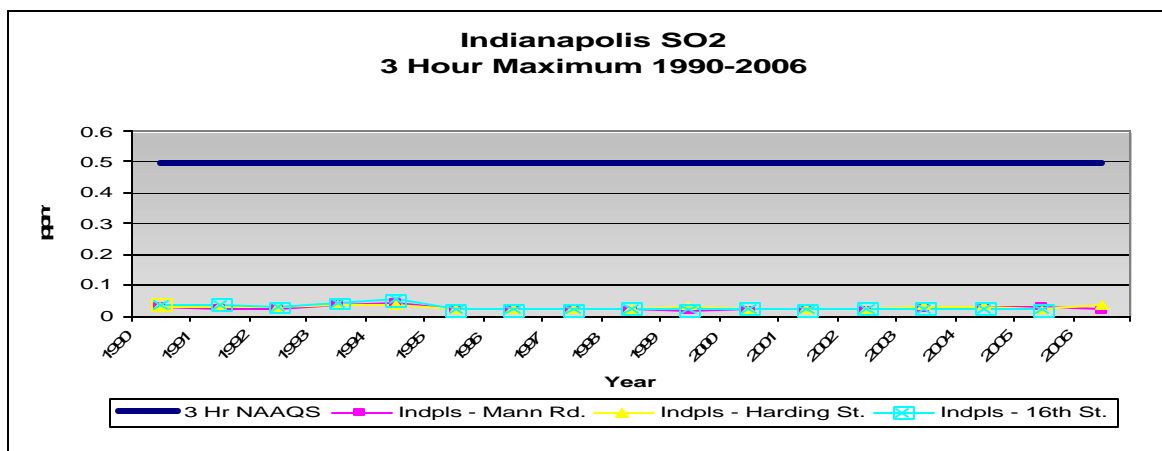


Figure 17 - Indianapolis SO2 3-Hour Maximum 1990 – 2006



### Table 19 - SO2 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	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	Unknown	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	No
180892008	Hammond - 141st St.	Lake	Hammond	1300 E. 141st Street	NAMS	08/01/75	Continuous	060	Neigh	Highest Conc	41.639444	-87.493611	Chicago-Naperville-Joliet, IL	No
180970073	Indpls - E. 16th St.	Marion	Indianapolis	6125 E. 16th St.	NAMS	04/02/90	Continuous	060	Neigh	Pop Exp	39.789167	-86.060833	Indianapolis-Carmel	No
181630012	Evansville - Mill Rd.	Vanderburgh	Evansville	Fire Station #17, 425 West Mill Rd	SLAMS	10/01/82	Continuous	060	Middle	Pop Exp	38.021667	-87.569444	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
RO: 0523 OPERATING AGENCY: Indianapolis Office of Environmental Services (IOES)														
180970042	Indpls - Mann Road	Marion	Indianapolis	8327 Mann Road	SLAMS	08/01/77	Continuous	075	Urban	Pop Exp	39.646254	-86.248784	Indianapolis-Carmel	Discontinue
180970057	Indpls - Harding St.	Marion	Indianapolis	1321 Harding St.	NAMS	03/04/82	Continuous	060	Neigh	Highest Conc	39.749019	-86.186314	Indianapolis-Carmel	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	Proposed Ncore	03/07/99	Continuous	100	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	Add
SO2 MONITORING METHOD: 060 - THERMO ELECTRON 43A, 43C, 43i, 100 - TELEDYNE INSTR. 100EU 075 - MONITOR LABS 8850S														

## PM<sub>2.5</sub> Speciation

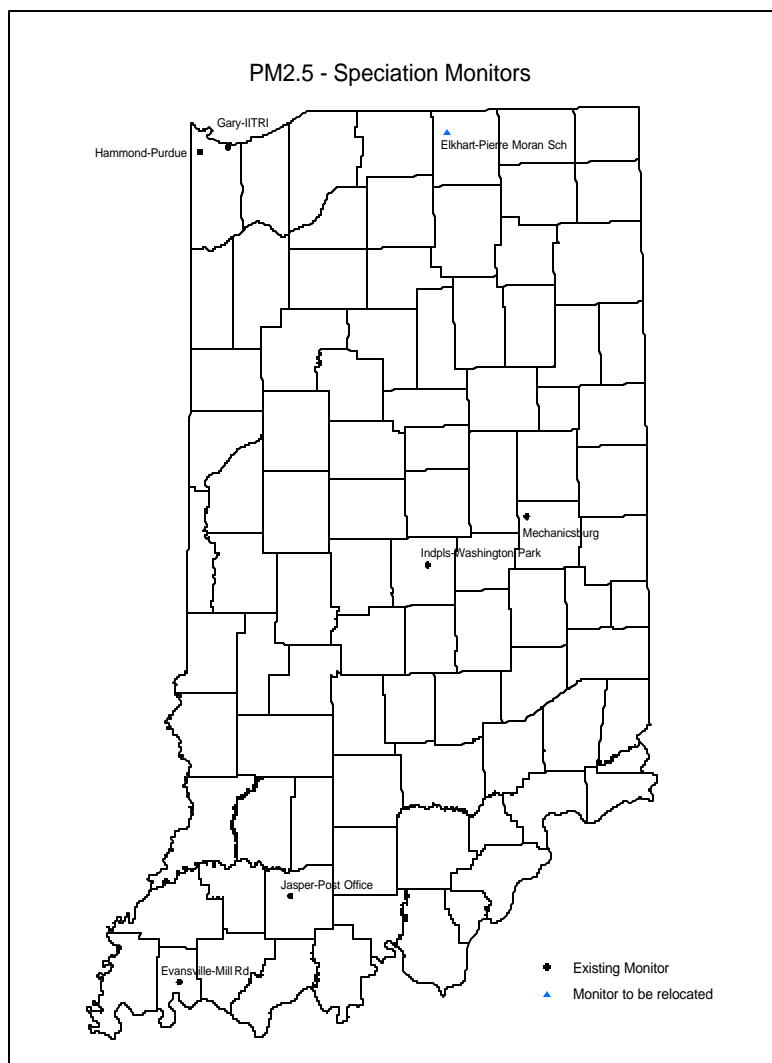
### Monitoring Requirements

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<sub>2.5</sub> 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 forty-eight (48) 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.

**Figure 18 - Speciation Monitoring Network**



The Met One SASS has been used at all sites to collect the three (3) samples in the past. In May 2007, as part of a nationwide conversion of the carbon sampling and analytical method to more closely match the IMPROVE analytical method, Indiana began to collect the carbon channel using the URG-3000N at three (3) sites; Gary – IITRI (180890022), Hammond – Purdue (180892004), and Indianapolis – Washington Park (180970078). Samples are collected on a 1/6 day sampling frequency at all sites except Washington Park, which samples every third day.

Indiana also operates continuous speciation monitor at two different locations. A Magee Model AE2100 Aethalometer, using optical absorption analysis methodology, is used for sampling black carbon at Indianapolis - Washington Park and Gary - IITRI. A Thermo Electron Model 5200 Sulfate Monitor, using Catalytic Thermal Reduction and Pulsed Fluorescence analysis, monitors sulfates at Indianapolis - Washington Park.

### Monitoring Network

Indiana speciation network consists of seven (7) sites across the state. Monitoring is planned to continue at seven (7) sites in 2008. The current network, along with any changes planned for 2008, is listed in Table 20.

### Network Modifications

Elkhart – Pierre Moran School (180390003) will be relocated to Elkhart – Prairie St. at the beginning of 2008. This new site is approximately one-half mile south of the current location. Access to Pierre Moran has been a problem on occasion.

A continuous sulfate monitor will be deployed at Evansville – Mill Rd. (181630012) during 2008.

The URG-3000N carbon samplers will be deployed at the remaining four (4) speciation sites at the beginning of 2008.

### Table 20 - PM2.5 Speciation 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	MSA	Site Change Proposed?	
180372001	Jasper - Post Office	Dubois	Jasper	Post Office, 206 E. 6th St	Suplmntl Speciation	01/04/05	6-Day	811, 812, 813	Neigh	Pop Exp	38.391389	-86.929167	Non-MSA County	No	
180390003	Elkhart - Pierre Moran Sch.	Elkhart	Elkhart	Pierre Moran Sch, 200 W. Lusher Ave.	Suplmntl Speciation	01/04/05	6-Day	811, 812, 813	Neigh	Pop Exp	41.667778	-85.969444	Elkhart-Goshen	Relocate	
	Elkhart - Prairie St.	Elkhart	Elkhart	2745 Prairie St.	Suplmntl Speciation		6-Day	811, 812, 813	Neigh	Pop Exp			Elkhart-Goshen	Relocation	
180650003	Mechanicsburg	Henry		Shenandoah HS, 7354 W. Hwy. 36	Suplmntl Speciation	02/01/02	6-Day	811, 812, 813	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, 813	Middle	Pop Exp	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	No	
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	Special Purpose	04/03/03	Continuous*	861	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, 813	Neigh	Pop Exp	41.585278	-87.474444	Chicago-Naperville-Joliet, IL	No	
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	Trends Speciation	12/13/00	3-Day	811, 812, 813	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No	
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	Special Purpose		Continuous*	861 , 875	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No	
181630012	Evansville - Mill Rd.	Vanderburgh	Evansville	Fire Station #17, 425 West Mill Rd	Suplmntl Speciation	10/05/02	6-Day	811, 812, 813	Neigh	Pop Exp	38.021667	-87.569444	Evansville, IN-KY	No	
181630012	Evansville - Mill Rd.	Vanderburgh	Evansville	Fire Station #17, 425 West Mill Rd	Special Purpose		Continuous*	875	Neigh	Pop Exp	38.021667	-87.569444	Evansville, IN-KY	Add	
*Continuous Parameters Per Location Gary-IITRI: Black Carbon PM <sub>2.5</sub> LC Indpls-Washington Park: Black Carbon PM <sub>2.5</sub> LC / Sulfate PM <sub>2.5</sub> LC Evansville-Mill Rd: Sulfate PM <sub>2.5</sub> LC															
MONITORING METHOD: 811 - MET ONE SASS TEFLON / ANALYSIS METHOD: ENERGY DISPERSIVE XRF 812 - MET ONE SASS NYLON / ANALYSIS METHOD: ION CHROMATOGRAPHY 813 - MET ONE SASS QUARTZ / ANALYSIS METHOD: STN TOT 861 - MAGEE AETHALOMETER AE2100 / ANALYSIS METHOD: OPTICAL ABSORPTION 875 - THERMO ELECTRON 5020 / CATALYTIC THERMAL REDUCT, PULSED FLUORESCENCE															



## Ozone Precursors (VOCs)

### Monitoring Requirements

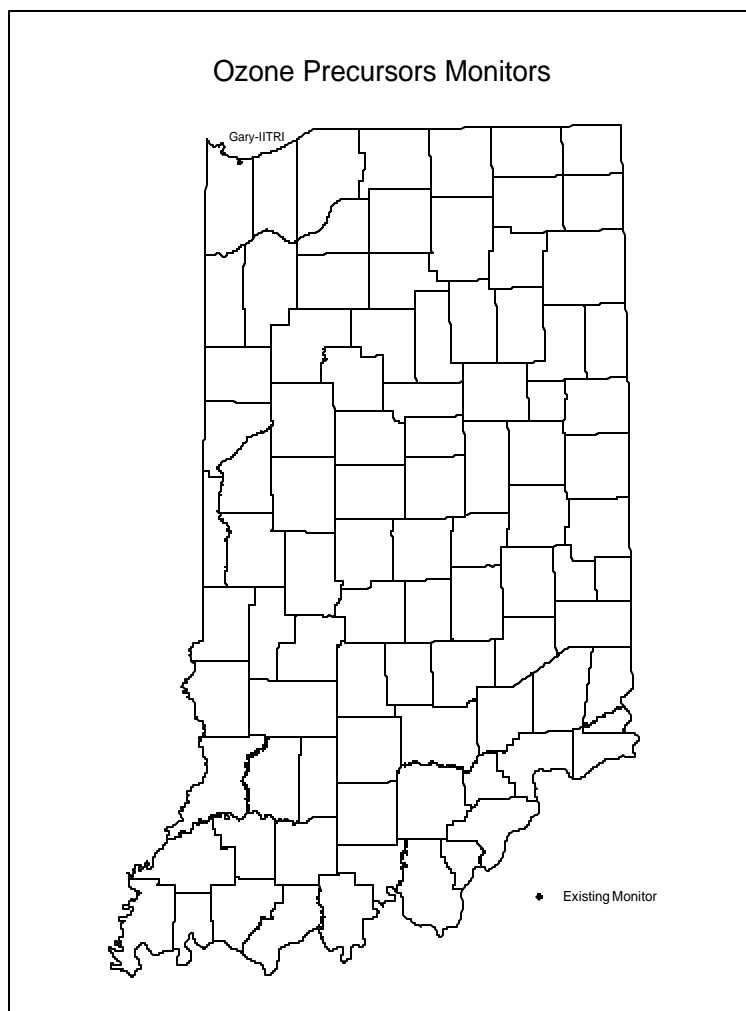
Ozone precursor monitoring is required as part of the PAMS program. The specific requirements are addressed in Table D-6 of 40 CFR Part 58 Appendix D. According to the Modified Network Plan for the Chicago Nonattainment Area, Indiana operates one (1) type 2 PAMS site. A type 2 site requires measurements for speciated VOCs, carbonyls, NO<sub>x</sub>, CO, O<sub>3</sub>, 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 GC, with dual 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.

Figure 19 - Ozone Precursors Network



### Monitoring Network

Indiana operates one PAMS monitoring site collecting ozone precursors VOCs at Gary – IITRI (180890022). The site details are in Table 21.

### Network Modifications

No changes are planned for ozone precursor VOC monitoring in 2008.

**Table 21 - Ozone Precursor Monitoring Network**

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

\*Data collected June, July, & August only

*MONITORING METHOD: 128 - PRECONCENTRATION ON TRAP / PE 8700; AUTO GC; SUBAMBIENT DUAL FID*  
*146 - 6L PRESSURIZED CANISTER / PE 8700; AUTO GC; SUBAMBIENT DUAL FID*

## Toxics (VOCs)

### Monitoring Requirements

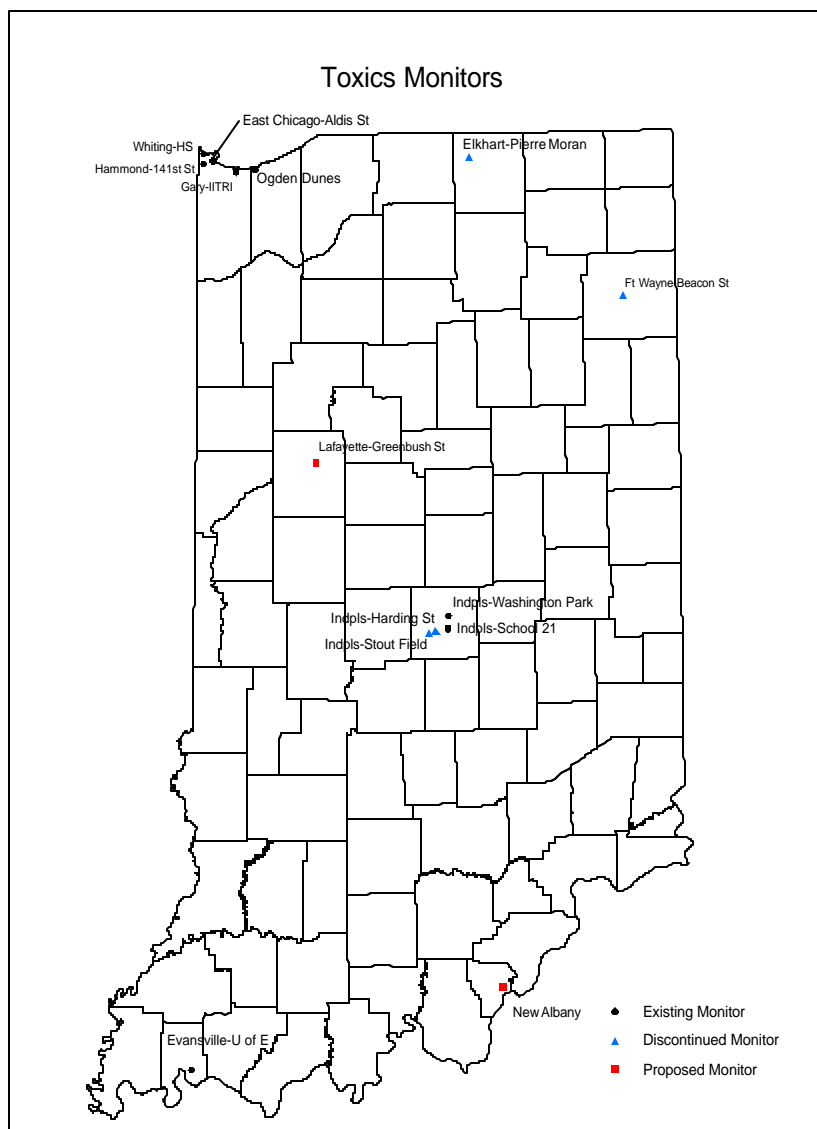
There are no requirements for toxics monitoring under 40 CFR Part 58.

### 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 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 and analyzed using a GC/MS to determine the concentration of the compounds found in the sample. Samples are collected for 24 hours on a 1/6 sampling schedule. Sixty-two (62) different VOCs are currently analyzed.

At Indianapolis – School 21 (180970084) a Perkin Elmer Clarus 500 GC, with dual FIDs and a TurboMatrix thermal desorber, is used to sample continuously for nine ozone precursor compounds which are also considered toxics. This is done using the PAMS ozone precursors monitoring protocol.

Figure 20 - Toxics Monitoring Network



### Monitoring Network

Indiana currently operates twelve (12) toxics monitors. The current network, along with any changes planned in 2008, is listed in Table 22.

### Network Modifications

Indiana plans to discontinue sampling at four (4) sites and add two (2) new monitors to its network during 2008.

A toxics monitor will be added to the Lafayette site on Greenbush St. (181570008) at the beginning of 2008. Indiana has not monitored in this area for toxics, and would like to investigate for potential problems. Citizens in the area have expressed concerns about potential toxics levels in the area.

A toxics monitor will be added in New Albany at the beginning of 2008. The southern part of the city is the target area. Indiana has not monitored in this area before and plans to investigate potential problems from either local sources or from the industrial westside of Louisville, Kentucky.

The Fort Wayne - Beacon St. (180030004) site will be

discontinued at the end of 2007. This monitor has operated as a special purpose monitor to investigate potential problems in the area. No significant findings have been discovered. The monitor has been in operation since the start of the third quarter of 2003.

The Elkhart - Pierre Moran School (180390003) site will be discontinued at the end of 2007. This monitor was originally one of the two (2) year sites collecting data as part of the four (4) city Children's Initiative Toxics Study to investigate potential problems in the area. No significant problems or dangerous levels of toxics have been discovered. The monitor has been in operation since May 18, 1999.

Indianapolis – Stout Field (180970085) and Indianapolis – Harding St. (180970057) will be discontinued at the end of September 2008. The monitoring phase of the Southwest Indianapolis Toxics Study ends at that time.

### Table 22 - Toxics 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	MSA	Site Change Proposed?
180030004	Ft Wayne - Beacon St.	Allen	Fort Wayne	2022 N. Beacon St.	Special Purpose	07/01/03	6-Day	150	Neigh	Pop Exp	41.094722	-85.101944	Ft. Wayne	Discontinue
180390003	Elkhart-Pierre Moran	Elkhart	Elkhart	Pierre Moran Sch, 200 W. Lusher Ave	Special Purpose	05/18/99	6-Day	150	Neigh	Pop Exp	41.667778	-85.969444	Elkhart-Goshen	Discontinue
		Floyd	New Albany		Special Purpose		6-Day	150	Neigh	Pop Exp			Louisville/Jefferson Co.	Add
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	Special Purpose	07/06/95	6-Day	150	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	150	Neigh	Pop Exp	41.652778	-87.439444	Chicago-Naperville-Joliet, IL	No
180890030	Whiting - HS	Lake	Whiting	Whiting HS, 1751 Oliver St.	Special Purpose	04/01/04	6-Day	150	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	150	Neigh	Pop Exp	41.639444	-87.493611	Chicago-Naperville-Joliet, IL	No
180970084	Indpls - School 21	Marion	Indianapolis	IPS Sch 21, 2815 English Ave.	Special Purpose	11/01/00	Continuous	128	Middle	Pop Exp	39.759083	-86.115556	Indianapolis-Carmel	No
181270024	Ogden Dunes	Porter	Ogden Dunes	Water Treatment Plant, 84 Diana Rd.	Special Purpose	08/15/98	6-Day	150	Neigh	Pop Exp	41.617500	-87.199167	Chicago-Naperville-Joliet, IL	No
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St.	Special Purpose	04/18/99	6-Day	150	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No
181570008	Lafayette - Greenbush St.	Tippecanoe	Lafayette	Cinergy Substation, 3401 Greenbush St.	Special Purpose	01/01/08	6-Day	150	Neigh	Pop Exp	40.431639	-86.852500	Lafayette	Add
181630016	Evansville - U of E	Vanderburgh	Evansville	Carson Center, Walnut St.	Special Purpose	06/05/99	6-Day	150	Neigh	Pop Exp	37.974444	-87.532222	Evansville, IN-KY	No
RO: 0523    OPERATING AGENCY: Indianapolis Office of Environmental Services (IOES)														
180970057	Indpls - Harding St.	Marion	Indianapolis	1321 Harding St.	Special Purpose	10/01/06	6-Day	150	Neigh	Pop Exp	39.749019	-86.186314	Indianapolis-Carmel	Discontinue
180970085	Indpls - Stout Field	Marion	Indianapolis	Stout Field, 2002 S. Holt Rd.	Special Purpose	10/01/06	6-Day	150	Neigh	Pop Exp	39.740383	-86.225950	Indianapolis-Carmel	Discontinue
MONITORING METHOD: 150 - 6L PRESSURIZED CANISTER / CRYOGENIC PRECON: GC/MS 128 - PRECONCENTRATION ON TRAP / PE 8700: AUTO GC: SUBAMBIENT DUAL FID														

## 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.

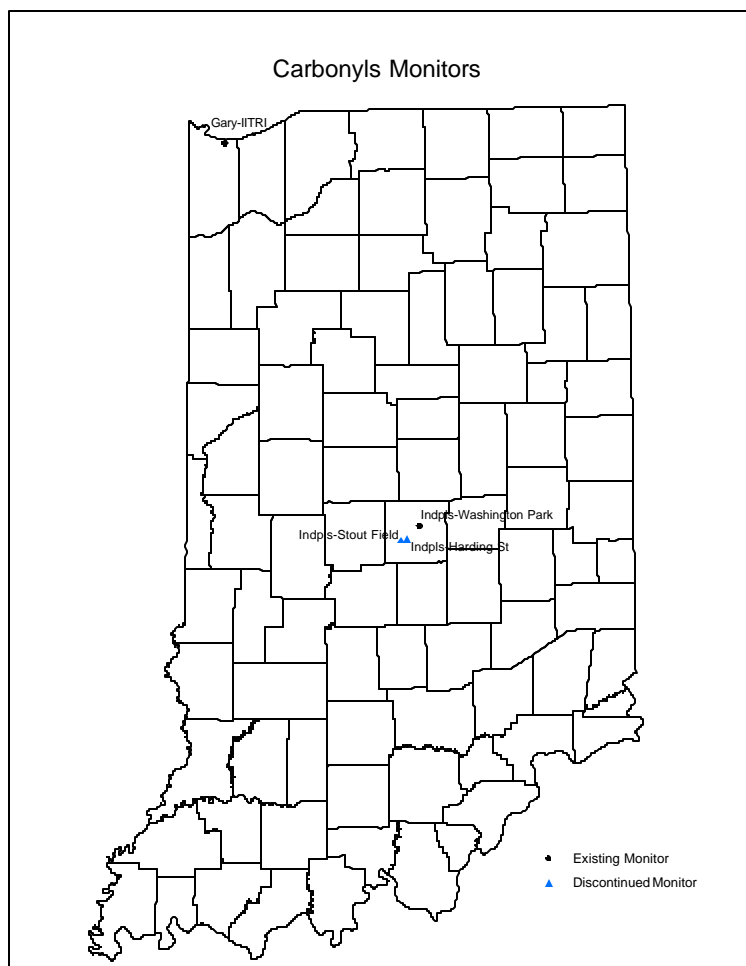
Carbonyl monitoring is also required as a grant condition at the two (2) monitoring locations which are part of the Southwest Indianapolis Toxics Study.

### Monitoring Methodology

Carbonyl data are collected using Method TO-11A of the of EPA's Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air Compendium of Method. Samples are collected by drawing a known volume air through a cartridge filled with silica gel coated with activated DNPH. These samples are analyzed using HPLC with a UV absorption detector.

Samples are collected on a 1/6 day sampling schedule at all sites. In addition, at the PAMS site at Gary – IITRI (180890022), four (4) 3-hour samples are also collected on a 1/3 day sampling schedule during June, July, and August.

Figure 21 - Carbonyl Monitoring Network



### Monitoring Network

Indiana currently operates four (4) carbonyl monitoring sites. Gary - IITRI collects data for the PAMS program. Indianapolis – Stout Field (180970085) and Indianapolis – Harding St. (180970057) collect data as part of the Southwest Indianapolis Toxics Study. Monitoring at Indianapolis – Washington Park is conducted as part of the toxics monitoring network. The details of the network are in Table 23.

### Network Modifications

The Stout Field and Harding St. sites will be discontinued at the end of September 2008. The field data collection phase of the Southwest Indianapolis Toxics Study will end at that time.

### Table 23 - Carbonyl 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	MSA	Site Change Proposed?
180890022	Gary - IITRI	Lake	Gary	IITRI Bunker, 201 Mississippi St.	Unofficial PAMS	06/01/95	3-Day (4-3Hr Samples)*	102	Neigh	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	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, 3120 E. 30th St	Special Purpose	04/18/99	6-Day	102	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No
							*June - August							
RO: 0523 OPERATING AGENCY: Indianapolis Office of Environmental Services (IOES)														
180970057	Indpls - Harding St.	Marion	Indianapolis	1321 S. Harding St.	Special Purpose	10/01/06	6-Day	102	Neigh	Pop Exp	39.749019	-86.186314	Indianapolis-Carmel	Discontinue
180970085	Indpls - Stout Field..	Marion	Indianapolis	Stout Field, 2002 S. Holt Rd.	Special Purpose	10/01/06	6-Day	102	Neigh	Pop Exp	39.740383	-86.225950	Indianapolis-Carmel	Discontinue
MONITORING METHOD: 102 - HPLC (TO-11A) DNPH-COATED CARTRIDGES														

## Metals

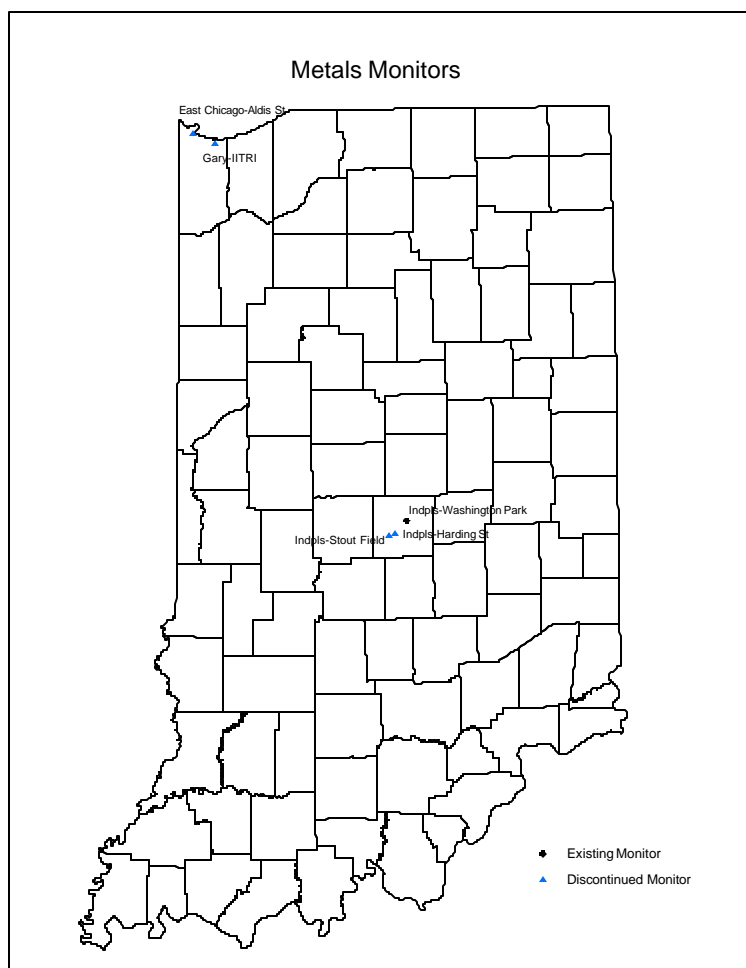
### Monitoring Requirements

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

### Monitoring Methodology

Metals data is collected using either a PM<sub>10</sub> or TSP sampler and collecting the sample on filters for a 24-hour period according to a 1/6 day sampling schedule. The TSP filters from Indianapolis – Washington ParK (180970078) are analyzed using the flameless atomic absorption method. Samples using PM<sub>10</sub> filters are collected at all other sites and analyzed using ICP-MS.

Figure 22 - Metals Monitoring Network



### Monitoring Network

There are five (5) sites that monitor particulate metals in Indiana. Arsenic, beryllium, cadmium, chromium, lead, manganese, and nickel are monitored at all sites. Antimony, cobalt, mercury, and selenium are also collected at the four (4) sites using PM<sub>10</sub> filters for collection. In addition, Chromium VI, is collected at Indianapolis – Harding St. (180970057) only. These sites are detailed in Table 24.

Indianapolis – Harding St. and Indianapolis – Stout Field (180970085) are collecting data as part of the Southwest Indianapolis Toxics Study. The monitoring study period is funded through a USEPA grant and began in October 2006. The study will run for two (2) years. Metals monitoring was initiated at East Chicago – Aldis St. (180890023) and Gary – IITRI (180890022) in 2007 to obtain like data from another industrial area of the state to compare to the data collected from the study.

### Network Modifications

Harding St. and Stout Field will be discontinued in September 2008 as the monitoring phase of the Southwest Indianapolis Toxics Study ends.

Aldis St. and IITRI will also be discontinued in September 2008 as the study period for the Southwest Indianapolis Toxics Study ends.



### Table 24 - Metals 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	MSA	Site Change Proposed?
180890022	Gary - IITRI <sup>1,2</sup>	Lake	Gary	IITRI Bunker, 201 Mississippi St.	Special Purpose	07/01/07	6-Day	204	Neigh	Pop Exp	41.606667	-87.304722	Chicago-Naperville-Joliet, IL	Discontinue
180890023	East Chicago - Aldis St. <sup>1,2</sup>	Lake	East Chicago	Water Filtration Plant, 3330 Aldis St.	Special Purpose	07/01/07	6-Day	204	Neigh	Pop Exp	41.652778	-87.439444	Chicago-Naperville-Joliet, IL	Discontinue
RO: 0523    OPERATING AGENCY: Indianapolis Office of Environmental Services (IOES)														
Site ID	Site Name	County	City	Address	Monitor Type	Start Date	Operating Schedule	Monitoring Method	Scale	Monitoring Objective	Latitude	Longitude	MSA	Site Change Proposed?
180970057	Indpls - Harding St. <sup>1,2,3</sup>	Marion	Indianapolis	1321 S.Harding St.	Special Purpose	10/01/06	6-Day	204	Neigh	Pop Exp	39.749019	-86.186314	Indianapolis-Carmel	Discontinue
180970078	Indpls - Washington Park <sup>2</sup>	Marion	Indianapolis	Washington Park, 3120 E. 30th St	Special Purpose	04/18/99	6-Day	107	Neigh	Pop Exp	39.811097	-86.114469	Indianapolis-Carmel	No
180970085	Indpls - Stout Field <sup>1,2</sup>	Marion	Indianapolis	Stout Field, 2002 S. Holt Rd.	Special Purpose	10/01/06	6-Day	204	Neigh	Pop Exp	39.740383	-86.225950	Indianapolis-Carmel	Discontinue
<div><div>1</div><div>2</div><div>3</div><div>Antimony</div><div>Lead</div><div>Chromium VI</div><div>Cobalt</div><div>Manganese</div><div>Mercury</div><div>Nickel</div><div>Selenium</div><div>Arsenic</div><div>Beryllium</div><div>Cadmium</div><div>Chromium</div></div>														
<div><div>MONITORING METHOD: 204 - WEDDING &amp; ASSC. MODEL 600 PM10 HI-VOL SAMPLER / ANALYSIS METHOD: ICP-MS</div><div>107 - WEDDING &amp; ASSC. MODEL 600 PM10 HI-VOL SAMPLER / ANALYSIS METHOD: FLAMELESS ATOMIC ABSORPTION</div></div>														

## Meteorological Parameters

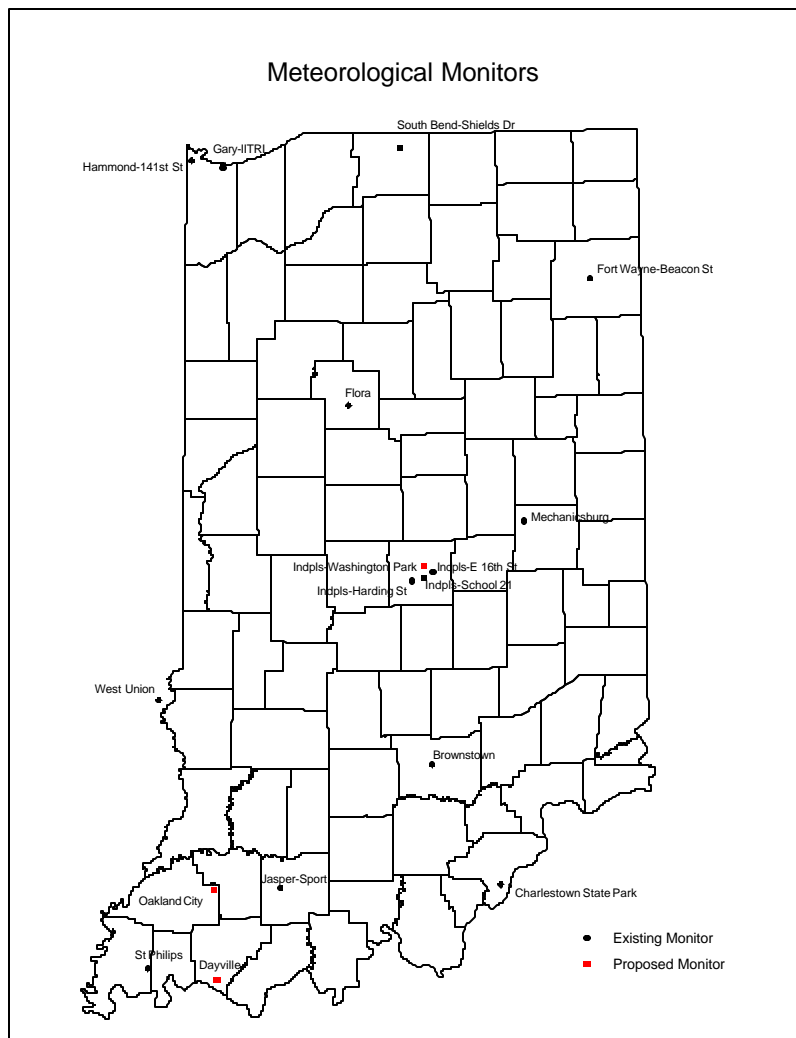
### Monitoring Requirements

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 data 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 and Local Agencies 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 fourteen (14) sites across Indiana. Sites are established to provide coverage in all areas of the state where pollutant monitoring is conducted. Table 25 details the meteorological sites and the parameters collected.

Figure 23 - Meteorological Monitoring Network



### Network Modifications

A new meteorological site will be deployed at Indianapolis – Washington Park (180970078) to fulfill the NCore requirement.

Meteorological monitoring will be added at the Dayville (181730011) site because representative meteorological data from NOAA for this area are not readily available.

Meteorological monitoring will also be added to the proposed Oakland City PM<sub>2.5</sub> monitoring site.

**Table 25 - Meteorological Monitoring Network**

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?
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
	Charlestown State Park	Clark		Charlestown State Park	38.394028	-85.664028	‡	‡	‡	‡					No
180370004	Jasper - Sport	Dubois	Jasper	Japer Sport Complex - 1401 12th Ave.	38.369436	-86.959031	‡								No
	Oakland City	Gibson					‡	‡		‡					Add
180650003	Mechanicsburg	Henry		Shenandoah HS, 7354 W. Hwy. 36	40.011667	-85.523611	‡	‡		‡			‡		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
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
180970078	Indpls - Washington Park	Marion	Indianapolis	Washington Park, 3120 E. 30th St	39.811097	-86.114469	‡	‡		‡					Add
180970084	Indpls - School 21	Marion	Indianapolis	IPS Sch 21, 2815 English Ave	39.759083	-86.115556	‡								No
181290003	St Phillips	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		2488 Eble Rd., Newburgh	37.954450	-87.321933	‡	‡		‡					Add
170230001	West Union	Clark Co., IL	West Union	416 S. St. Hwy 1	39.210883	-87.668416	‡	‡	‡	‡					No
RO: 0523 OPERATING AGENCY: Indianapolis Office of Environmental Services (IOES)															
Site ID	Site Name	County	City	Address	Latitude	Longitude	WS / WD	RH	Baro Press	Outside Temp	UV Rad	Solar Rad	Vertical WS	Precip	Site Change Proposed?
180710001	Brownstown	Jackson		225 W & 300 N	38.920798	-86.080523	‡	‡		‡					No
180970057	Indpls - Harding St.	Marion	Indianapolis	1321 Harding St.	39.749019	-86.186314	‡	‡	‡	‡					No

## **Appendix A**

### **Comments Received Regarding Indiana 2008 Ambient Air Monitoring Annual Network Plan**

As per 40 CFR Subpart B, 58.10 (a)(1), the annual network plan must be made available for public inspection for at least thirty (30) days prior to submission to EPA. The plan was posted in the What's New area of the Office of Air Quality page on IDEM's website on September 19. The address of the plan is <http://www.in.gov/idem/programs/air/amb/networkplan.html>. At the request of several groups and individuals, the comment period was extended to October 31.

#### **Introduction**

In the proposed Indiana 2008 Ambient Air Monitoring Annual Network Plan, seven (7) PM<sub>10</sub> site discontinuations and seven (7) PM<sub>2.5</sub> site discontinuations will result in eight (8) monitoring locations that will not have any type of air quality monitoring in the future. However, three (3) new monitoring sites for PM<sub>2.5</sub>, three (3) new meteorological monitoring sites and two (2) relocated toxics monitoring sites, along with establishing NCore monitoring parameters, will replace these site discontinuations.

The original fine particulate monitoring network for Indiana, implemented in 1999, provided for more monitoring locations than was actually required by EPA. After five to seven years of operation, multi-site areas such as South Bend, Fort Wayne, Indianapolis, and Evansville have proven to produce duplicative data and do not need as many sites. This proposed streamlining of the particulate monitoring networks has provided the resources to address needed enhancements and to implement new monitoring technologies to the Indiana air quality monitoring networks. A new state of the art data acquisition and web-based data posting system is approximately 50% deployed. It should be completed during 2008 due to this proposed network streamlining. Additionally, the development and implementation of the Indianapolis NCore site will be much more time and labor intensive than the operation of the particulate sites.

#### **Comments and Responses**

A summary of the comments received and IDEM's response to the comments are as follows:

##### **Comment #1**

Tim Maloney, Senior Policy Director for the Hoosier Environmental Council, submitted comments recommending that the following new monitoring sites be considered for the 2008 Monitoring Plan:

- 1) A NCore site be established in northeast Lake County.
- 2) A NCore site be established in Warrick or Spencer County.
- 3) PM<sub>2.5</sub> monitors be established in northeastern Pike County and in Dearborn County.
- 4) A CO monitoring site be established downwind of the I-69 corridor between I-465 Pendleton.
- 5) Establish an O<sub>3</sub> monitoring site in Dearborn County.
- 6) Maintain the toxics monitors in southwest Marion County until results of the pending toxics study determine whether continued monitoring is appropriate.
- 7) Establish a toxics monitoring site in eastern Porter County.
- 8) Include the USGS/IDEM mercury monitoring network into the 2008 Monitoring Plan.

Mr. Maloney also recommends that IDEM seek additional funding to expand future monitoring efforts.

##### **Response to Comment #1**

1. A NCore site to be established in northeast Lake County.
2. A NCore site to be established in Warrick or Spencer County.

The NCore trend sites are established by USEPA to provide data comparisons for different pollutants for different geographic areas across the Nation. These sites have evolved from National Air Toxic Trends Sites (NATTS); IMPROVE sites, and Beta-test sites for various PM monitoring methods studies. The NCore sites normally have a rich historical database for many pollutants. Currently there is a NCore site for the Chicago MSA at Northbrook, a northern Chicago suburb. Lake and Porter Counties are considered part of the Chicago MSA. There is also a rural NCore site located at Bondville, IL, which is southwest of Champaign. The current proposed Indianapolis NCore site monitors for intermittent and continuous PM<sub>2.5</sub>, PM<sub>2.5</sub> speciation for sulfates, nitrates, and elemental and organic carbon, and continuous sulfate and black carbon. Ozone, meteorological parameters, and trace level monitors for CO, SO<sub>2</sub>, and NO<sub>y</sub> will be added in 2008. PM<sub>coarse</sub> monitoring would be added when acceptable instruments are available. NCore sites are very resource intensive, both in state of the art instruments and staff time required to operate the instruments. IDEM will be learning much about the setup and operation of an NCore site through this initial installation. At this time, IDEM does not feel that it is necessary to petition USEPA to consider establishing any more NCore sites in Indiana in addition to the current NCore site in Indianapolis, however, this request will be considered again during next year's network review once experience is gained in NCore monitoring.

3. PM<sub>2.5</sub> monitors to be established in northeastern Pike County and in Dearborn County.

Due to a vast number of comments received from citizens in the Oakland City area, IDEM will commit to establishing a PM<sub>2.5</sub> and meteorological monitoring site near or downwind of Oakland City to operate on a 1-3 day frequency for a period of three years. This site will be used to determine compliance with the PM<sub>2.5</sub> NAAQS and provide background information for any proposed future industrial expansion. This proposed site will be near the Gibson/Pike County line and should reflect air quality conditions for fine particulate for both counties. The Hamilton County Environmental Services, Air Quality Management Division, operates eight (8) PM<sub>2.5</sub> monitoring sites in the Cincinnati area and Dearborn County, IN as part of the Cincinnati MSA. At this time, IDEM does not believe that it is cost effective to operate a PM<sub>2.5</sub> monitoring site in Dearborn County with a rich database of PM<sub>2.5</sub> information nearby and downwind.

4. A CO monitoring site to be established downwind of the I-69 corridor between I-465 Pendleton.

CO concentrations at the street canyon/corridor sites in Indianapolis, East Chicago, Ft Wayne and Evansville have been well below both the 1-hour and the 8-hour NAAQS for many years. These sites use inlet probes that are 3 meters above the sidewalks and 1 meter from the curb edge of high traffic density downtown streets that are designed to monitor the worst-case population exposure to CO. Over the past three years, the Indianapolis site recorded a high 8-hour value of approximately 45% of the NAAQS and the other three sites were well below that value. Neighborhood scale CO monitoring sites always record lower values than the street corridor sites. A monitoring site downwind of the I-69 corridor would put the receptor location in one of the strip malls at an exit on the east side of I-69. Although this recommendation has some merit, IDEM does not believe that the concentrations at an ambient, neighborhood scale, location downwind of the I-69 corridor would be as high as those sites with curb-side probes.

5. Establish an O<sub>3</sub> monitoring site in Dearborn County.

The Hamilton County Environmental Services, Air Quality Management Division, operates an O<sub>3</sub> monitor at Colerain, a western Cincinnati suburb, which is believed to be representative of the Dearborn County oxidant plume. The Hamilton County O<sub>3</sub> site is approximately 5 miles from Dearborn County. At this time, IDEM does not believe it would be cost effective to operate an O<sub>3</sub> monitoring site in Dearborn County given the availability of nearby data, or commensurable benefit attained as a result of this proposed addition.

6. Maintain the toxics monitors in southwest Marion County until results of the pending toxics study determine whether continued monitoring is appropriate.

The Southwest Indianapolis Toxics Study was funded by a grant from USEPA and monitoring will end on September 30, 2008. A portion of the analysis performed on the samples collected is accomplished using an EPA contract lab in North Carolina. Money was set aside from the grant award to perform this analysis and this funding source will be exhausted at the end of the grant period, which is September 2008. We understand that if the risk assessment conducted on the data collected indicates an air quality problem in SW Indianapolis, then we will need to consider a permanent air toxic monitoring site for the area. We will address the need for a permanent air toxic site after the study has been completed.

7. Establish a toxics monitoring site in eastern Porter County.

An air toxic monitor is currently located at the Ogden Dunes Water Treatment Plant in Porter County. Compliance inspectors have collected "grab" samples from various locations east of Ogden Dunes due to complaints from time to time, but the data have not resulted in any concentrations of concern and are normally in line with concentrations seen at the Ogden Dunes site. We will continue to work with our Compliance inspectors and analyze grab samples based on complaints in areas where we currently do not monitor for air toxics. At this time, IDEM does not believe there is a benefit to adding another Porter County air toxic site or relocating the existing site at the Ogden Dunes Water Treatment Plant.

8. Include the USGS/IDEM mercury monitoring network into the 2008 Monitoring Plan.

The mercury monitoring project, which is a joint effort between IDEM and the USGS, consists of wet deposition monitoring for mercury at four (4) locations in Indiana. The sites are operated by USGS personnel with no resources for this program coming from the Air Monitoring Branch. This monitoring project has never been part of the Indiana ambient air monitoring networks and the data is not submitted to the Federal data repository. USEPA has not asked for these sites to be part of the ambient air monitoring network plans and none of the other Region 5 states submit the mercury monitoring sites as part of their plan submittals. In order to maintain consistency with other Region 5 states, IDEM will continue to keep the mercury monitoring plans separate from the ambient air monitoring plans and under the control of the USGS. The USGS mercury monitoring plan and past reports on mercury monitoring in Indiana can be found online at: <http://in.water.usgs.gov>.

## **Comment #2**

John Blair, Valley Watch, Inc. submitted comments recommending the following improvements to the 2008 Ambient Air Monitoring Plan:

- 1) Establish six (6) additional air toxics monitors to be source oriented downwind of facilities which emit carcinogenic pollutants.
- 2) Relocate the University of Evansville monitors to a height closer to the ground.
- 3) Establish O<sub>3</sub> and PM<sub>2.5</sub> monitors in Spencer, Gibson, Posey, and Pike Counties.
- 4) Establish a CO monitor in Knox County and specifically in Edwardsport.
- 5) Establish a monitoring site in southern Pike County for all criteria pollutants (O<sub>3</sub>, CO, NO<sub>2</sub>, SO<sub>2</sub>, Pb, PM<sub>2.5</sub>) and mercury.
- 6) Add PM<sub>2.5</sub> and mercury monitoring to the Leopold O<sub>3</sub> site (Perry County).
- 7) Establish daily FRM filter PM<sub>2.5</sub> sites in Dubois and Vanderburgh Counties.

## **Response to Comment #2**

1. Establish six (6) additional air toxics monitors to be source oriented downwind of facilities which emit carcinogenic pollutants.

The IDEM currently operates twelve (12) air toxics monitoring stations throughout Indiana. Ten (10) of these sites are considered neighborhood scale, population exposure sites and two (2) sites are classified as middle scale, source-impacted sites. While current workloads will not allow for an expanded air toxics monitoring network in 2008, IDEM will continue to work with our Compliance inspectors to analyze “grab” samples collected downwind of sources suspected of emitting hazardous air pollutants.

2. Relocate the University of Evansville monitors to a height closer to the ground.

The University of Evansville, Carson Center Building is used to provide a monitoring platform for PM<sub>2.5</sub> and air toxics monitoring equipment. Probe inlet height requirements for both parameters are 3 to 15 meters above ground level. The probe height for the instruments at the Carson Center is 10.7 meters and the site does provide for excellent separation distances from trees and other obstructions that can be very difficult to meet at ground level monitoring sites, particularly in older, well established neighborhoods with many mature trees. Although the site meets all applicable Federal probe siting criteria, IDEM will conduct a survey of the University of Evansville area in an attempt to find a suitable air monitoring location with probe heights at the lower end of the range while still meeting all other applicable probe siting criteria.

3. Establish O<sub>3</sub> and PM<sub>2.5</sub> monitors in Spencer, Gibson, Posey, and Pike Counties.

Due to a vast number of comments received from citizens in the Oakland City area, IDEM will commit to establishing a PM<sub>2.5</sub> and meteorological monitoring site near or downwind of Oakland City, in Pike County, to operate on a 1-3 day frequency for a period of three years. This site will be used to determine compliance with the PM<sub>2.5</sub> NAAQS and provide background information for any proposed future industrial expansion. This proposed site will be near the Gibson/Pike County line and should reflect air quality conditions for fine particulate for both counties. IDEM is currently operating a PM<sub>2.5</sub> monitoring site in Spencer County at the David Turnham School in Dale, IN. At this time, IDEM believes the Southwest Indiana fine particulate air monitoring network to be representative of the air quality in this area of the state and there are no immediate plans to expand PM<sub>2.5</sub> monitoring into Posey and Gibson Counties. O<sub>3</sub> monitoring is currently being conducted in Posey County and in both counties adjacent to Spencer County (Warrick and Perry). Additionally, ozone monitoring was conducted in Gibson County from 1999 through 2003 with no 3-year averages above the NAAQS. At this time, Indiana's O<sub>3</sub> monitoring network exceeds EPA's minimum standards in the quantity of monitors throughout the state. IDEM does not have the resources to further expand O<sub>3</sub> monitoring into Gibson, Pike, and Spencer Counties and does not believe the network would significantly improve from these proposed additions.

4. Establish a CO monitor in Knox County and specifically in Edwardsport.

As addressed in the responses to comment #1, carbon monoxide concentrations at micro-scale downtown street corridor sites have been well below the NAAQS for many years and neighborhood scale sites have recorded even lower concentrations. If a proposed source is suspected of emitting high concentrations of CO and modeling as a result of the permit application bears this out, then ambient air quality monitoring would be required in the permit for CO.

5. Establish a monitoring site in southern Pike County for all criteria pollutants (O<sub>3</sub>, CO, NO<sub>2</sub>, SO<sub>2</sub>, Pb, PM<sub>2.5</sub>) and mercury.

A monitoring site for PM<sub>2.5</sub> will be established downwind of Oakland City near the Gibson/Pike County line to determine compliance with the NAAQS. IDEM believes that it is not probable that any of the other criteria pollutants would exceed the NAAQS in Pike County and does not feel that monitoring for all criteria pollutants to be cost effective with commensurable benefit at this time.

6. Add PM<sub>2.5</sub> and mercury monitoring to the Leopold O<sub>3</sub> site (Perry County).

Mercury monitoring in Indiana is conducted by the USGS with monies from a USEPA grant applied for by USGS and IDEM. Liquid chromatographic analysis for these samples is conducted by the USGS laboratory. The scope of work for this grant is defined at the current level of 4 sites and at this time, IDEM does not have the resources to expand this network.

Expanding the Leopold O<sub>3</sub> site to include PM<sub>2.5</sub> and mercury parameters does have merit, however, the scope of the mercury monitoring with the USGS/IDEM grant was addressed above. The current PM<sub>2.5</sub> monitoring network in southwest Indiana exceeds USEPA requirements and is considered to be an adequate monitoring network. IDEM will revisit the possibility of adding PM<sub>2.5</sub> to the Leopold O<sub>3</sub> site location during the 2009 network monitoring plan review.

7. Establish daily FRM filter PM<sub>2.5</sub> sites in Dubois and Vanderburgh Counties.

Daily Federal Reference Method (FRM) monitoring for PM<sub>2.5</sub> currently is performed at the Jasper Post Office site in Dubois County. Continuous (hourly) PM<sub>2.5</sub> monitoring is currently being conducted at Fire Station #17 in Evansville, IN, Vanderburgh County. The data collected hourly in Evansville for PM<sub>2.5</sub> is used to inform the public of the Air Quality Index for the area and is also posted to the USEPA "AIRNow" website for public air quality information. The USEPA approved designated daily FRM site for southwest Indiana is for the Jasper Post Office site. IDEM believes the PM<sub>2.5</sub> networks in Dubois and Vanderburgh adequately reflect the air quality for this region of the state.

### **Comment #3**

Bill McCoy, Patoka Wildlife Refuge Manager, Alfred J. Cooper, Mayor-Elect, Oakland City, and Richard Vernier have provided comments requesting monitoring for PM<sub>2.5</sub>, PM<sub>2.5</sub> speciation, air toxics, and meteorological parameters be established in Oakland City, IN or at the Patoka Wildlife Refuge or in Winslow, IN.

### **Response to Comment #3**

Due to a vast number of comments received from citizens in the Oakland City area, IDEM will commit to establishing a PM<sub>2.5</sub> monitoring site near or downwind of Oakland City to operate on a 1-3 day frequency for a period of three (3) years. This site will be used to determine compliance with the PM<sub>2.5</sub> NAAQS and provide background information for any proposed future industrial expansion. A ten (10) meter meteorological tower will also be installed at this proposed monitoring location to collect data for wind speed, wind direction, ambient temperature, and relative humidity. Fine particulate speciation monitoring is currently being conducted at seven (7) locations throughout Indiana including two (2) sites in southwest Indiana at Jasper and Evansville. The analysis on these specialized filters is performed by a USEPA contract lab with set-aside grant monies. IDEM does not have the opportunity to add sites to this fine particulate speciation network at this time. The IDEM currently operates twelve (12) air toxic monitoring stations throughout Indiana. Ten of these sites are considered neighborhood scale, population exposure sites and two (2) sites are classified as middle scale, source-impacted sites. Current workloads for air toxic monitoring will not allow for an expanded network at this time, however, if sources are suspected of emitting hazardous air pollutants, we will continue to work with our Compliance inspectors to analyze "grab" samples collected downwind of these sources.

### **Comment #4**

Marietta Smith submitted comments requesting that an air monitor be placed in every county of Indiana.

### **Response to Comment #4**

IDEM does not have the resources to conduct air quality monitoring in every county of Indiana and it would not be an appropriate use of State and Federal tax dollars to do so. Indiana's ambient air



monitoring network is designed to monitor ambient air across the state by logical and strategic placement of different types of monitors and exceeds federal requirements for states.

#### **Comment #5**

Carolyn A. Marsh, Whiting, IN submitted comments requesting that monitors be placed in Whiting, Indiana for PM<sub>2.5</sub>, PM<sub>10</sub>, and “all chemicals not currently monitored”.

#### **Response to Comment #5**

IDEM currently conducts air quality monitoring in Whiting at the Whiting High School for O<sub>3</sub> and air toxics. Air toxic samples are analyzed for sixty-two (62) toxic compounds every sixth day for a 24 hour composite average. O<sub>3</sub> monitoring is conducted hourly from April 1st to September 30th every year. Additionally, IDEM operates an extensive network for PM<sub>2.5</sub>, PM<sub>10</sub>, and all other criteria pollutants in Lake and Porter Counties. IDEM believes that the current level of air quality monitoring being conducted in northwest Indiana is more than adequate to accurately assess air pollution exposure. At this time, IDEM does not feel that it is necessary to expand the air quality monitoring networks in Whiting.

#### **Comment #6**

Many comments were concerned about attainment/non-attainment status of Pike and Gibson Counties for PM<sub>2.5</sub> in light of surrounding counties which are classified non-attainment. They feel that Gibson and Pike Counties also should be designated as non-attainment, and that a monitor in this area would indicate that PM<sub>2.5</sub> values are over the standard. There are several large sources of air pollution in the area. The following citizens or organizations request an air monitoring station in the Oakland City area:

James Richard  
Janet Powers (2)  
Daniel Murray  
Kathy Torres  
Jeri Parr  
Karmen Hatton  
Jaime Bolin  
Rachelle Lox  
Ruth J. Lewis  
Gary L. Phillips  
Erin Janelle Hartke  
Anthony Woolsey  
James Hedrick  
Stanley H. Burns  
Anita Murray  
Reba Henning  
Patsy McCrary  
Bryan Bolin  
Allen Powers  
Judy L. Whitehead  
Nita Greenway  
Bonnie Mason  
Rustin Hartke  
Shawn Jenkins  
Robin Kinder  
Angela Story  
Tina Willis  
Jane Rusher  
Tracy Powell  
Jay Birkla  
Chris McCandless  
Debra L. Bryant  
Karen Darden  
Rhonda Evans  
Nancy Johns  
Karen Miller  
Claude Roeder  
Tara Kixmiller  
Gary Murray  
Teresa Russell  
Susan C. Miller  
Eileen Sue Titzer  
Lois F. Roeder  
Ken Dupps  
Sue Arburn  
Christina Stolz  
Emmett Williams  
Sandy Williams  
Tom Morrison  
Jay Thorne  
Doris June Wells  
Cindy Dye  
Carol & Jessie Edington  
Wayne Simmons  
Winnery K. Windels  
Wanda D. Whitt

Nancy Buloch  
Marlin Wells  
Steve Lynn  
Virginia Harris  
Darrel Whitt  
Karen L. Kraay  
Shirley Skelton  
Monica Ash  
Renee Lashbrook  
Tom Wells  
June L. Harvey  
Norman Bulloch  
Nyla Simmons  
Marla Morrison  
Angela Wells  
Roumilda Bradfield  
Marian Lynn  
Kenneth Tucker  
Brandon Morrison  
Kelly Jarboe  
Kimberle J. Ard  
Robert D. Wright  
Freida Hedrick  
John R. Keith  
Harry R. Cassiday  
Barbara Chumley  
E. Gerald Chumley  
Randy Peavler  
Rachel Lewis  
Rodney Green  
Sandra L. Dupps  
Raydin Green  
Ronald Green  
Concerned resident (2)  
Michael & Monica Atkins  
Janet Beadles (2)  
Dale Beadles (3)  
Sue Keith  
John R. Keith  
Teresa Beadles  
Shannon L. Lewis  
Rachel L. Lewis  
Jed A. Beadles (2)  
Pike Gibson Citizens for  
Quality Environment(Nat  
Beck, Shannon L. Lewis)  
Edward A. Ziller  
Patricia Hunt  
Jeff Mullen  
Scott Trader  
Christopher S. Ziller  
Connie VanMeter (2)  
Barbara Schenks  
Valerie McCoy  
Anne Myers  
Dennis Keith

Shirley Bell  
James Broshears  
Kreg Battles (State  
Representative)  
Pauline Singer  
Monica Atkins  
Eva Brashears  
Deatra Laswell  
David Laswell  
Stephen VanMeter  
Sue Vernier  
Nancy Gelhausen  
Stephen Heeger (Evansville  
Audubon Society)

**Response to Comment #6**

An air monitoring site to collect PM<sub>2.5</sub> concentrations and meteorological parameters data will be located near Oakland City in 2008. The PM<sub>2.5</sub> sampler will operate on a one (1) in three (3) day sampling schedule. The site would be approximately midway between Duke Energy's, Gibson Generating Station and the City of Jasper. The information gathered at this site would aid in establishing background values for Jasper, to be used to help define the PM<sub>2.5</sub> concentrations monitored at Jasper. It would provide information on NAAQS compliance in the area, and also provide a baseline of PM<sub>2.5</sub> concentrations in anticipation of future industrial expansion and new transportation patterns.