



Allegheny County  
Health Department

# Allegheny County Air Quality Program

## Permitting and Monitoring

**Sandra Etzel**

*Air Pollution Control Permitting Manager  
Allegheny County Health Department*

*January 21, 2016*

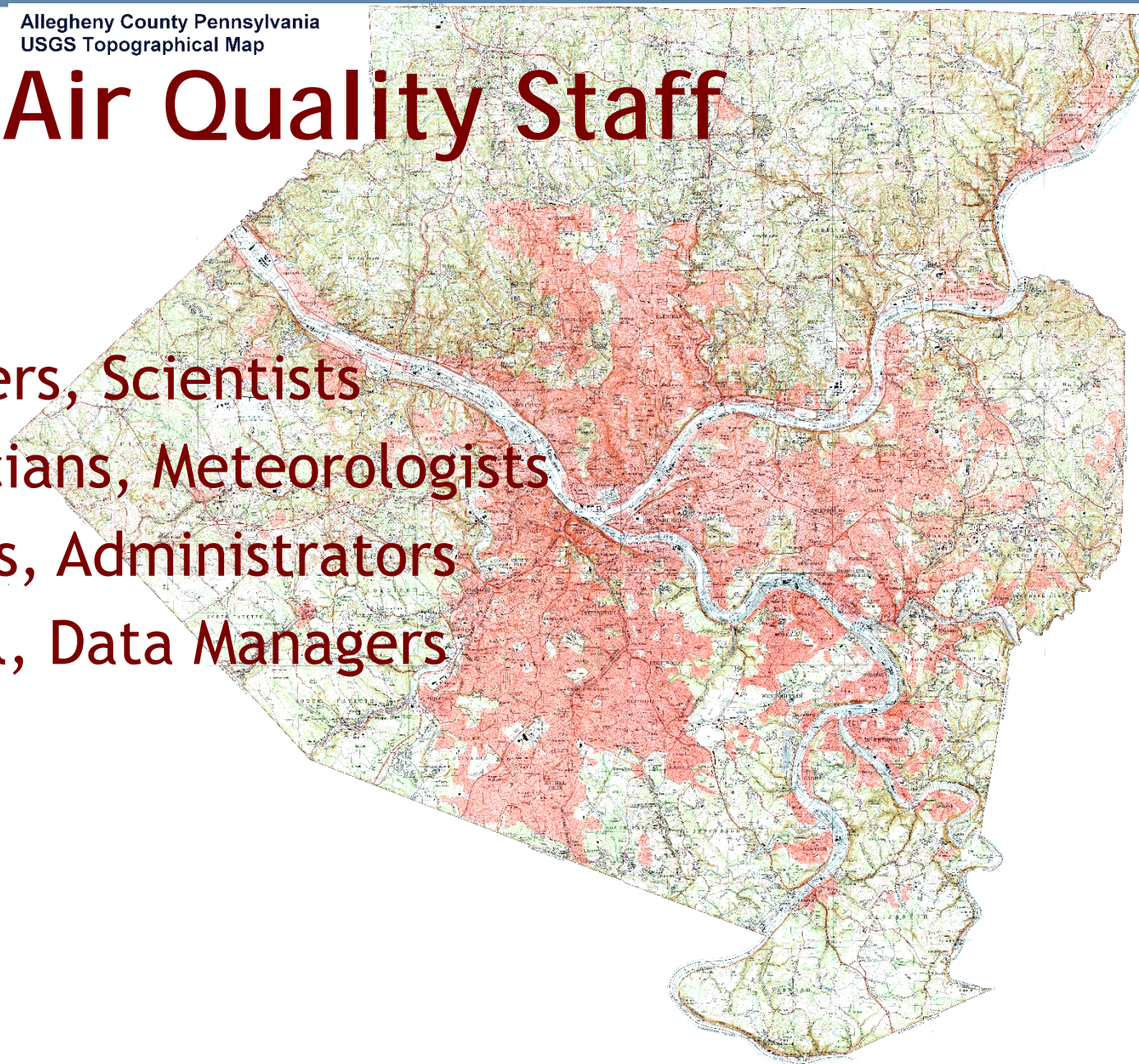




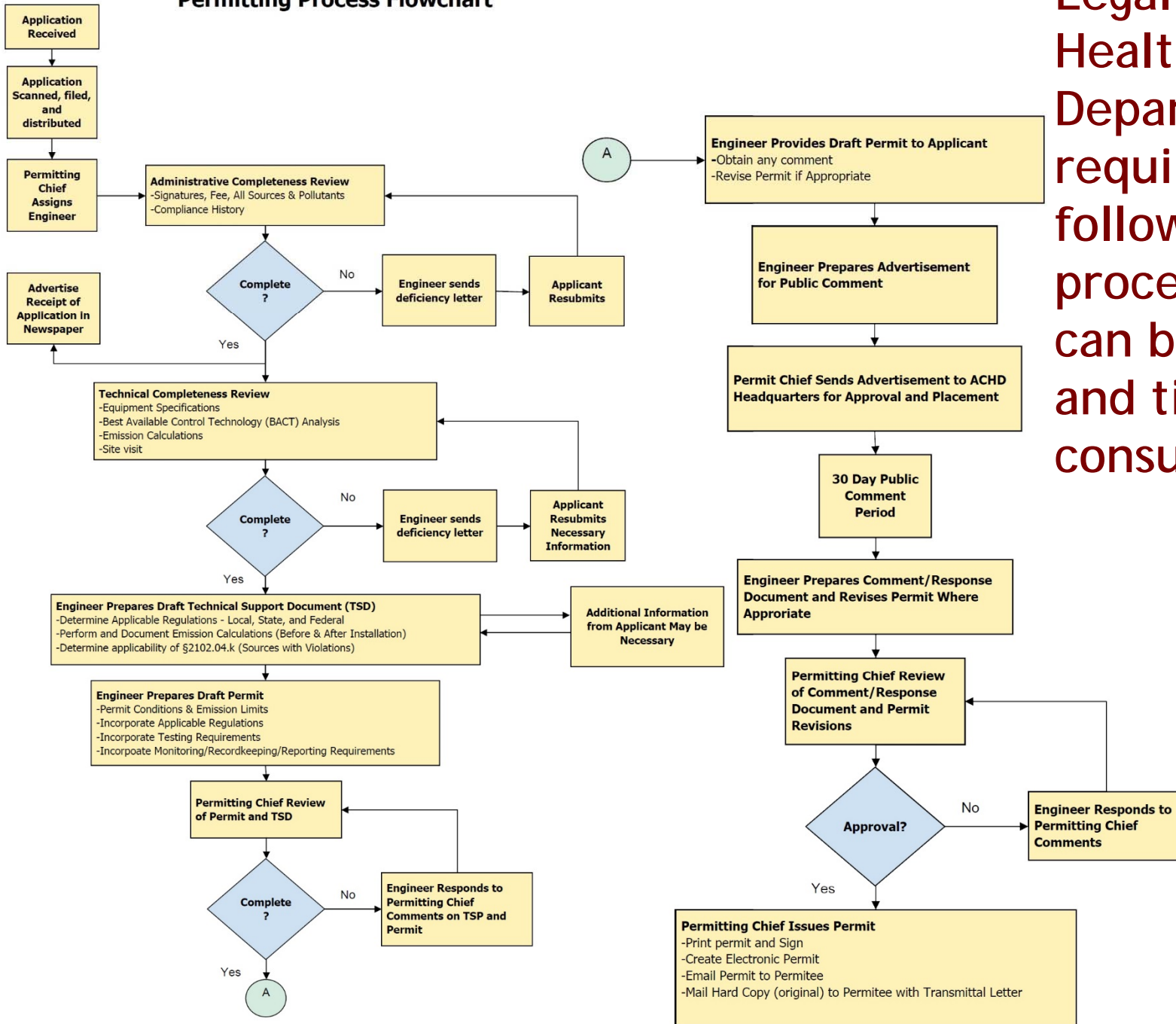
Allegheny County Pennsylvania  
USGS Topographical Map

# Air Quality Staff

- 50 staff
  - Engineers, Scientists
  - Technicians, Meteorologists
  - Lawyers, Administrators
  - Clerical, Data Managers



## Air Quality Program Permitting Process Flowchart



Legally, the Health Department is required to follow a procedure that can be complex and time-consuming





# Permitting

All significant sources of air pollution must have a permit to operate.

Permits control pollution and set inspection requirements; regulatory agencies may impose fines if air pollution limits or other permit terms are not met.

Allegheny County has permitted 443 significant sources of air pollution, in addition to 962 other sources.





# AIR QUALITY PERMITTING

- Air Quality Permits incorporate all the Federal, State and County requirements into one enforceable document.
- Requirements apply to sources of all types and sizes - from individual boilers at schools and hospitals to steel manufacturing and coal-fired power plants.



Mount Lebanon School



Clairton Coke Works





# Air Quality Permitting

Air Quality Permits incorporate all the Federal, State and County requirements into one enforceable document.

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# Air Pollutants of Concern

## Criteria Pollutants



Fine  
Particulates



Ozone



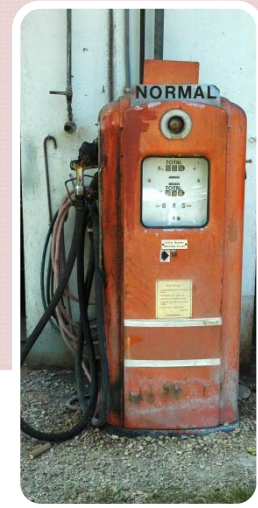
Carbon  
Monoxide  
(CO)



Sulfur  
Dioxide  
(SO<sub>2</sub>)



Nitrogen  
Oxides  
(NO<sub>x</sub>)



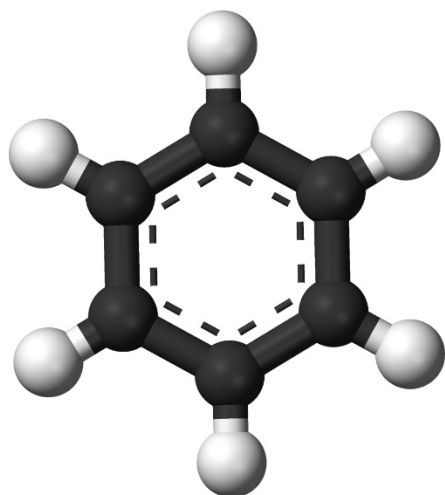
Lead



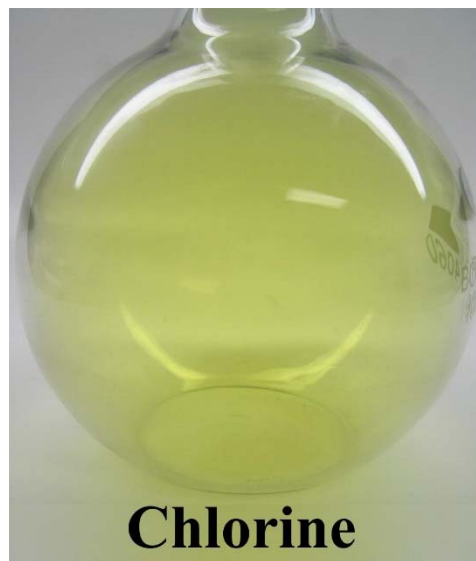


## 187 Hazardous Air Pollutants determined by federal regulations

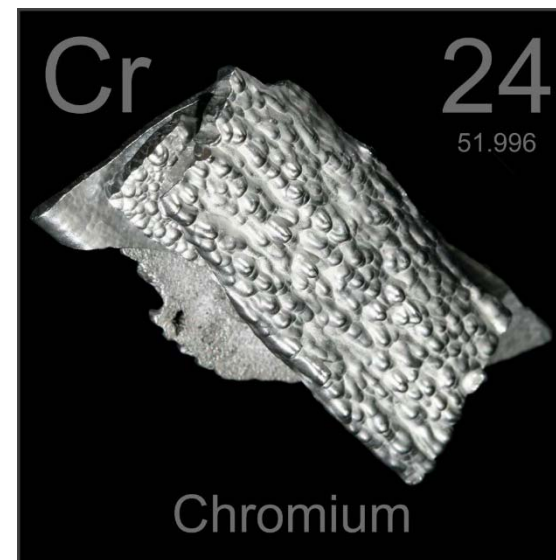
## Additional Air Toxics determined by county policy



**BENZENE**



**Chlorine**



**Chromium**





# Air Pollution Source Categories

Major Sources *(aka Title V or Part 70)*

Emit at least 100 Tons/year of PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>x</sub>, SO<sub>x</sub>, CO or 50 Tons/year VOC or 100,000 Tons/year CO<sub>2e</sub>. Emit at least 10 Tons/year of a single HAP Emit at least 25 Tons/year of a combination of HAP



Edgar Thompson





# Air Pollution Source Categories

## Synthetic Minor Sources

Capable of emitting pollutants at the rate of a Major Source, but choosing to accept enforceable limitations to reduce potential emissions below Major Source levels



UPMC Mercy Hospital





# Air Pollution Source Categories

## Minor Sources



Allderdice High School



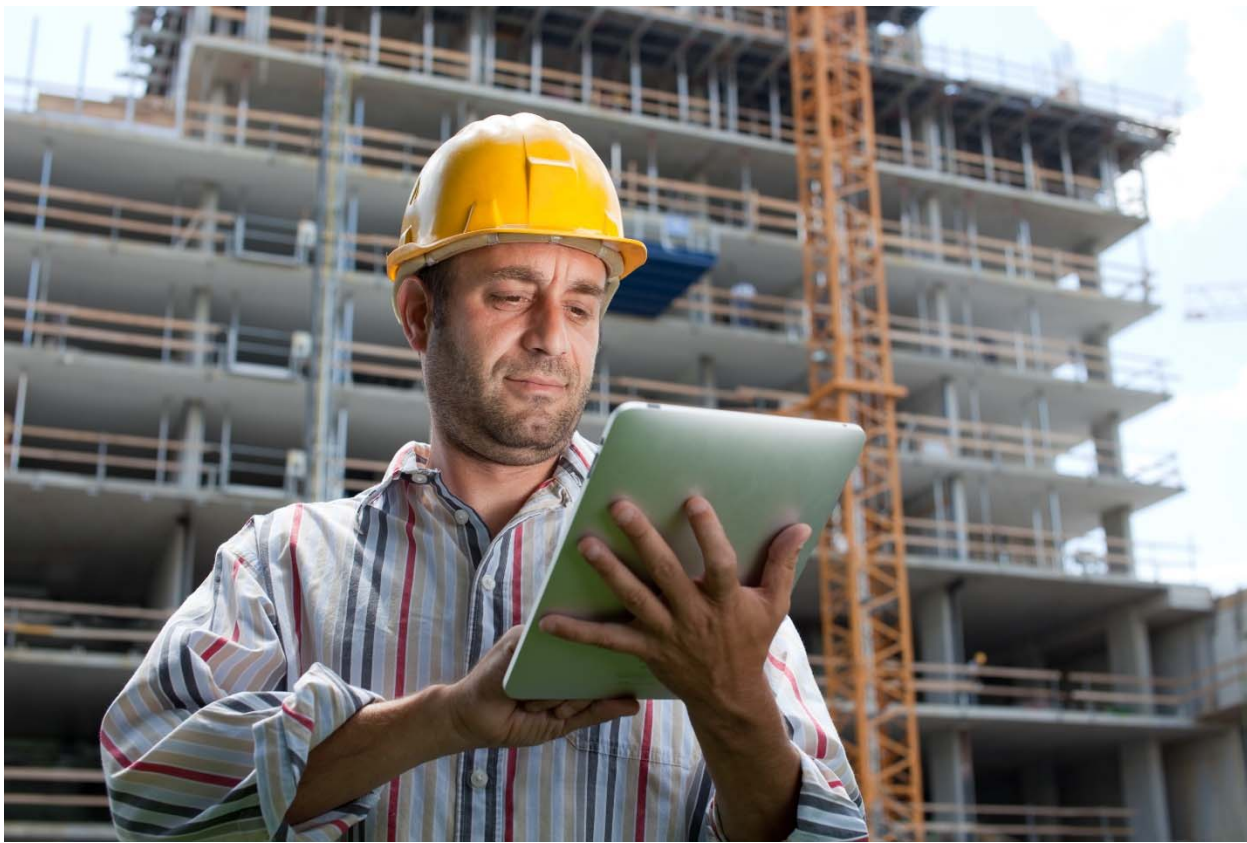
Allderdice Athletics





# Air Pollution Source Categories

Non-permitted (exempt)







# Types of Permits Issued

Installation Permits - new construction or physical modifications at a facility







# Types of Permits Issued

Operating Permits - for existing facilities to operate

32 Major Sources (Title V)

59 Synthetic Minor

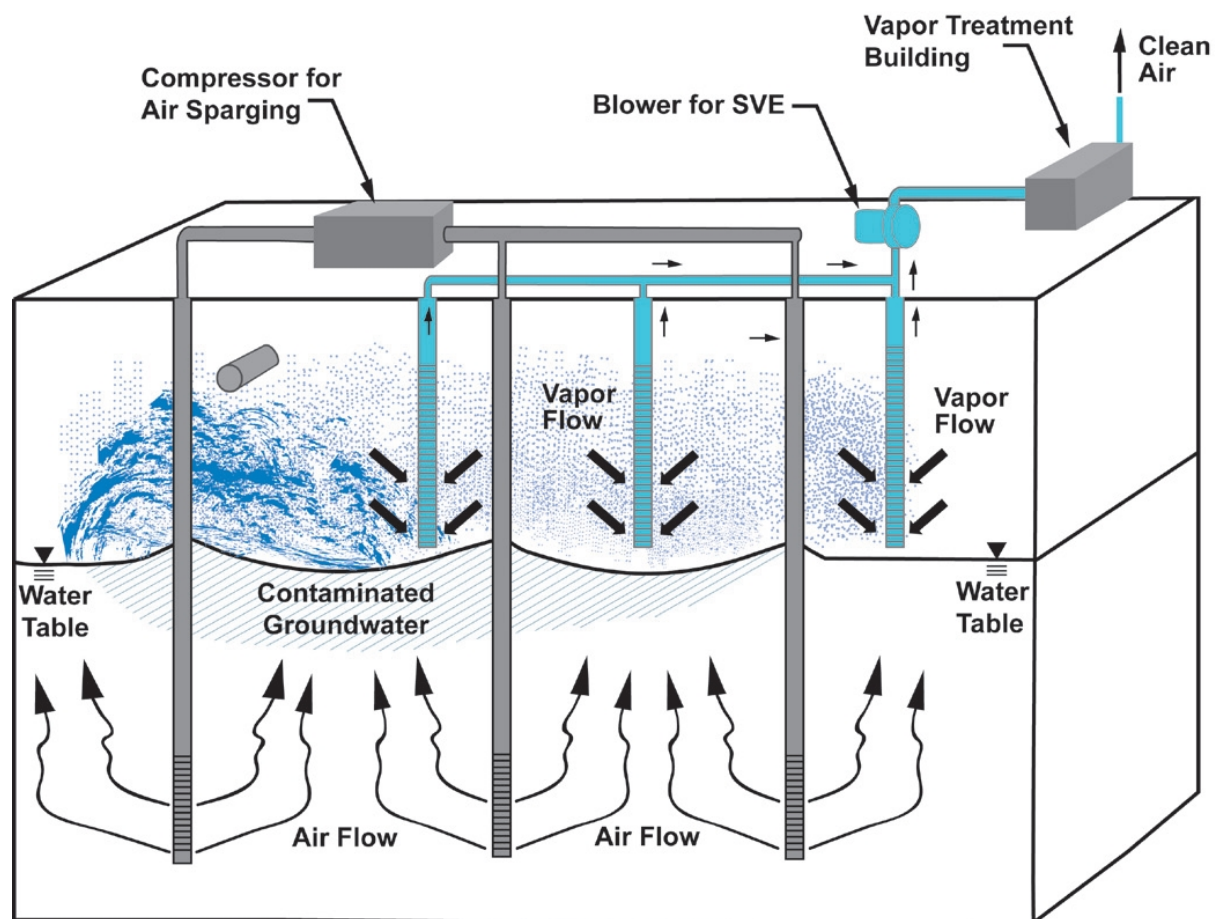
318 Minor Sources





# Types of Permits Issued

## General Permits (Soil Vapor Extraction)







# Other Engineering Activities

Permit Determination Requests

Do I need a permit??







# Other Engineering Activities

RACT and BACT Determinations

What are best practices?

Does the equipment that I am buying use  
The cleanest technology?







# Other Engineering Activities

Implementation of the Air Toxics Guideline



The Air Toxics Guidelines take into account the health effects of air emissions. Recent medical studies are incorporated from national databases.



The background of the slide features a stack of gold bars and several gold coins. The bars are stacked in a pyramid-like structure, with some bars in the foreground showing markings such as '3254', 'CRED SUIS', '10 G', 'GOLD', and '999'. The coins are scattered to the left of the bars, showing various designs. The lighting is warm and focused on the gold, creating a rich, golden glow.

# Permit Fees

- There are fees to apply for an Installation Permit and an Operating Permit.
- Depending upon the type of regulations that apply to the source the installation permit fee varies from \$1,000 to \$22,700.
- Operating Permit Fees vary from \$375 to \$2,250.





# Other Engineering Activities

Implementation of the Air Toxics Guideline



The Air Toxics Guidelines take into account the health effects of air emissions. Recent medical studies are incorporated from national databases.

**ALLEGHENY COUNTY HEALTH DEPARTMENT  
Air Quality Permit Application Checklist**

Facility: Acme Corp Permit No.: \_\_\_\_\_  
 Source Type:  Major  Minor  Syn. Minor  
 Permit Type:  Operating  Installation  Modification  
 Date Received: 1/21/16 Date Reviewed: 1/21/16  
 Reviewed By: Sandra Etzel

Application Reviewed & Deemed Complete Date: _____
Technically Complex? <input type="checkbox"/> Yes <input type="checkbox"/> No
Subject to PDG? <input type="checkbox"/> Yes Due: _____ <input type="checkbox"/> No

*The application review must be completed within 10 business days of receipt of the application.*

Administrative Review and Follow-Up	Yes	No	n/a
Has the application been entered into the electronic tracking system?			
Does the application contain any confidential business information (CBI)?			
Was a pre-application meeting held? Date: _____			
<b>Permit Review Process</b> <i>(This section to be completed after the application has been reviewed)</i>			
Does the Permit Decision Guarantee timeframe apply? <i>(Installation Permits only)</i>			
Is the application information sufficient to begin Permit and Technical Support Document (TSD) draft?			
<i>If the deficiencies are minor and can be resolved with an email or telephone call, do so before moving further in the permit review process. Allow 1 week.</i>	Date Requested	Due Date	Date Received
Person Contacted: _____			
<i>If the deficiencies are not minor, a deficiency letter must be sent.</i>			
First deficiency letter – Allow 1-2 weeks Person Contacted: _____			
Second deficiency letter <i>(major source &amp; technically complex only)</i> – Allow 1-2 weeks Person Contacted: _____			
Recommend Elevated Review Process to Permit Chief <i>Decision must be made withing 15 business days of notification to the facility.</i>			

Review For Administrative Completeness	Yes	No	n/a
<b>Section 1:</b> Is the checked permit type correct for this application?		✓	
<b>Section 1:</b> Is there a process description (including relevant process flow diagrams) included in the application?		✓	
<b>Sections 2 &amp; 3:</b> Is the source information provided, including an address for the facility?		✓	
<b>Section 3:</b> Are location coordinates and SIC codes provided?		✓	
<b>Section 4:</b> Is information for an Environmental or Facility Contact provided?		✓	
<b>Section 5:</b> Have all applicable requirements, including all NSPS, NESHAP, and MACT requirements, been addressed?		✓	

## Installation Permit Review

- ACHD engineers review Installation Permits for completeness.
  - Complete applications include:
    - Specifications for all equipment
    - Best Available Control Technology (BACT) analyses
    - Emissions calculations
- All complete Installation Permit applications are summarized and advertised in local newspapers





# Draft Installation Permits

- Once a permittee receives its Draft Installation Permit, it may comment on incorporated requirements.
  - A Technical Support Document is also drafted explaining how the Department arrived at the permit conditions.
- ACHD will revise the Draft Installation Permit based on the permittee's comments, if appropriate.
- ACHD will advertise notice of intent to issue (or deny) Installation Permit in a newspaper and will post it on the Department's webpage. This initiates the 30-day public comment period.
- After the 30-day public comment period ends, the Engineer will prepare a comment and response document and revise the permit if appropriate.



# Operating Permits

Operating Permits incorporate all the Installation Permit operation and performance requirements for the modified or new equipment. Testing, monitoring, recordkeeping and reporting requirements from the IP are also incorporated into the OP.





# What's in a permit?

General and Facility-wide requirements





# What's in a permit?

Equipment and/or process requirements







# What's in a permit?

## Testing requirements





# What's in a permit?

## Monitoring requirements







# What's in a permit?

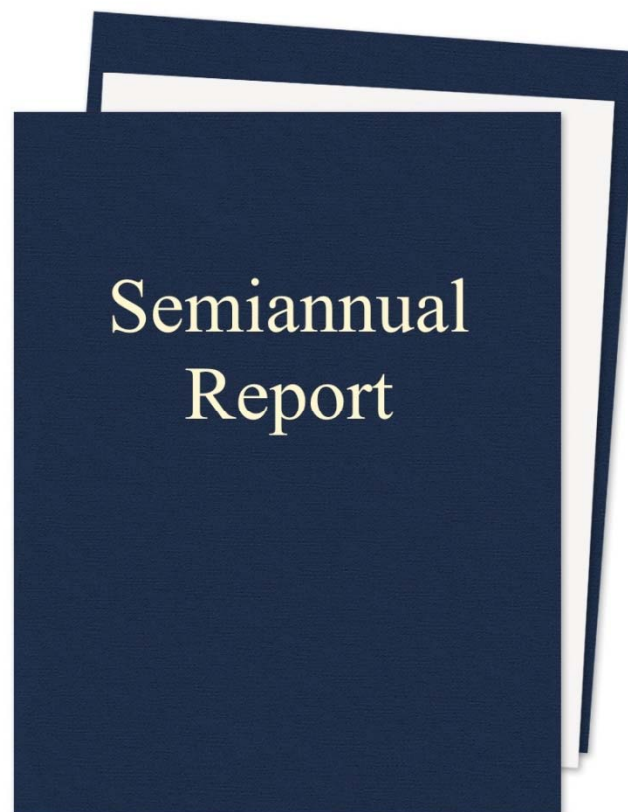
## Record keeping requirements





# What's in a permit?

Reporting requirements



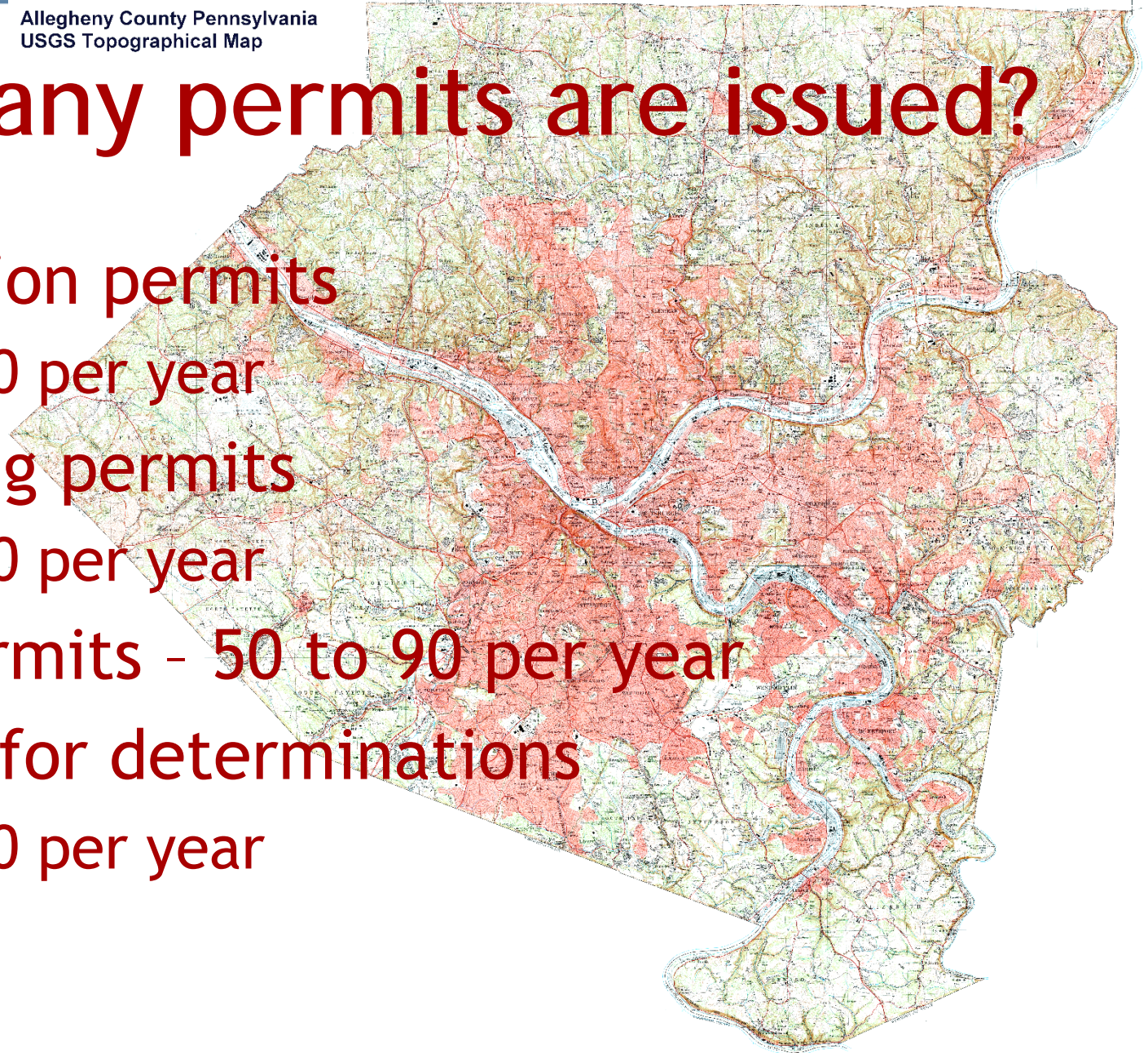




Allegheny County Pennsylvania  
USGS Topographical Map

# How many permits are issued?

- Installation permits
  - 30 to 50 per year
- Operating permits
  - 20 to 60 per year
- Total permits - 50 to 90 per year
- Request for determinations
  - 60 to 70 per year







# Thank you!

## Sandra Etzel

Air Pollution Control Permitting Manager  
Allegheny County Health Department

[setzel@achd.net](mailto:setzel@achd.net)

[www.achd.net](http://www.achd.net)





Allegheny County  
Health Department

# Allegheny County Air Quality Program

## Monitoring and Lawrenceville

**David D Good**

*Air Pollution Control Permitting Manager  
Allegheny County Health Department*

*January 21, 2016*





# Criteria Pollutants



Fine  
Particulates



Ozone



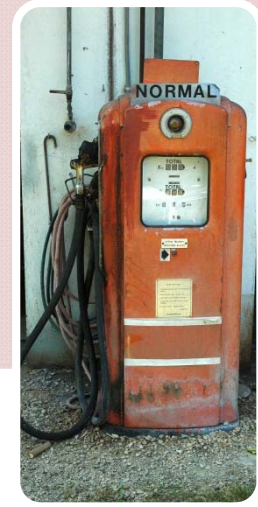
Carbon  
Monoxide  
(CO)



Sulfur  
Dioxide  
(SO<sub>2</sub>)



Nitrogen  
Oxides  
(NO<sub>x</sub>)



Lead





## National Ambient Air Quality Standards (NAAQS)

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
<a href="#">Carbon Monoxide</a> [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
<a href="#">Lead</a> [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3 month average	0.15 µg/m <sup>3</sup> (1)	Not to be exceeded
<a href="#">Nitrogen Dioxide</a> [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]		primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		primary and secondary	Annual	53 ppb (2)	Annual Mean
<a href="#">Ozone</a> [73 FR 16436, Mar 27, 2008]		primary and secondary	8-hour	0.075 ppm (3)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
<a href="#">Particle Pollution</a> Dec 14, 2012	PM <sub>2.5</sub>	primary	Annual	12 µg/m <sup>3</sup>	annual mean, averaged over 3 years
		secondary	Annual	15 µg/m <sup>3</sup>	annual mean, averaged over 3 years
		primary and secondary	24-hour	35 µg/m <sup>3</sup>	98th percentile, averaged over 3 years
	PM <sub>10</sub>	primary and secondary	24-hour	150 µg/m <sup>3</sup>	Not to be exceeded more than once per year on average over 3 years
<a href="#">Sulfur Dioxide</a> [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973]		primary	1-hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year



# ACHD Air Monitoring Network

- 14 Air Monitoring Stations

## Criteria Pollutant Monitors

- 5 Sulfur Dioxide
- 3 Carbon Monoxide
- 3 Oxides of Nitrogen (4 monitors)
- 3 Ozone (3 monitors)
- 9 PM<sub>10</sub> (12 monitors, 5 continuous)
- 10 PM<sub>2.5</sub> (17 monitors, 5 continuous)
- 2 Lead (3 monitors)





## Monitoring Stations

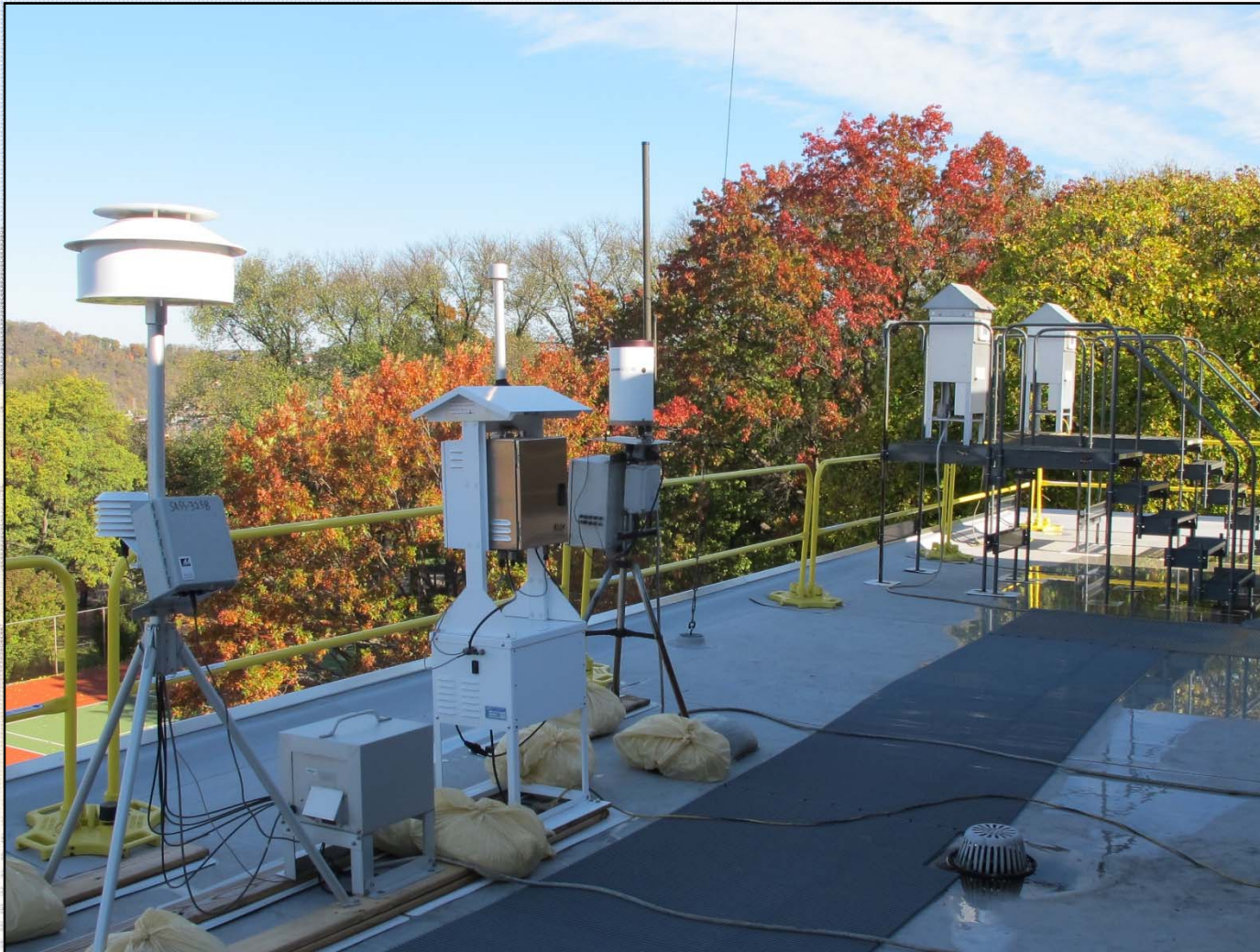
Data from ACHD monitors is available to all in many forms.

ACHD posts live data on our website, [www.achd.net](http://www.achd.net), for anyone to review.

Annual reports are also composed containing detailed information of all air pollution levels and trends.







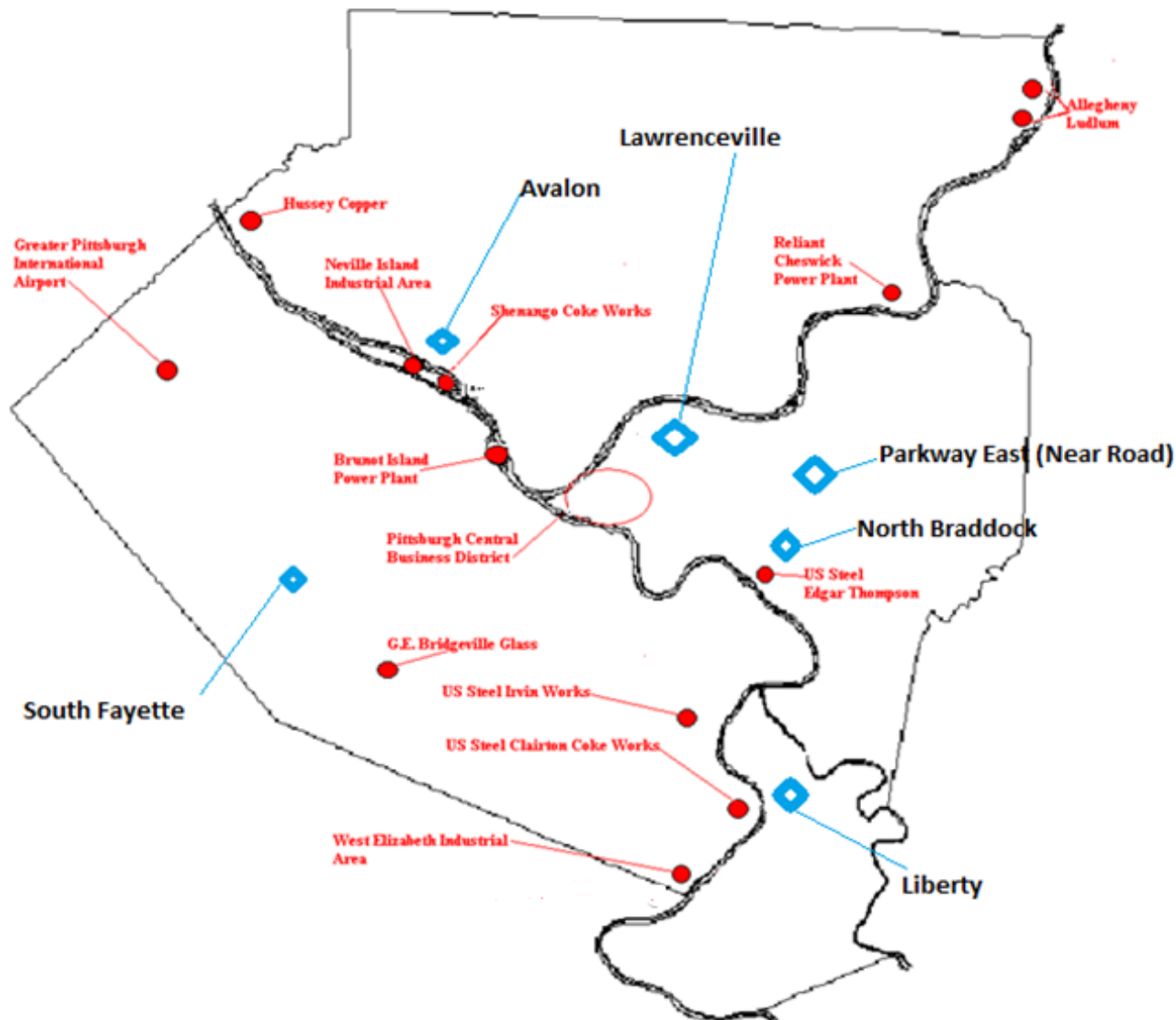
Monitoring Stations





# Meteorological Sensors (6 Sites)

- Wind Speed
- Wind Direction
- Outside Temperature
- Relative Humidity





# Lawrenceville NCORE Monitors

## PM<sub>2.5</sub> and Precursor Gases

- SO<sub>2</sub> Trace Level
- CO Trace Level
- Total Reactive Nitrogen (NO<sub>y</sub>) Trace Level
- PM<sub>2.5</sub> + Speciation
- PM Coarse Continuous (PM<sub>10</sub>-PM<sub>2.5</sub>)
- Ozone
- Meteorological Tower





# Other Pollutants Monitored

- Dustfall (3 sites)
- HAP Metals (1 Site)
- PM<sub>2.5</sub> Speciation (2 sites, 4 monitors)
  - Trace Metals, Total Mass
  - Sulfates and Nitrates
  - Carbon (Oc/Ec)
- Flag Plaza Air Toxics (Every Six Days)
  - TO-15 SUMA Canister (96 Volatile organic compounds)
  - TO-11 Cartridge (7 Carbonyl Compounds)



## *Particulate Matter*

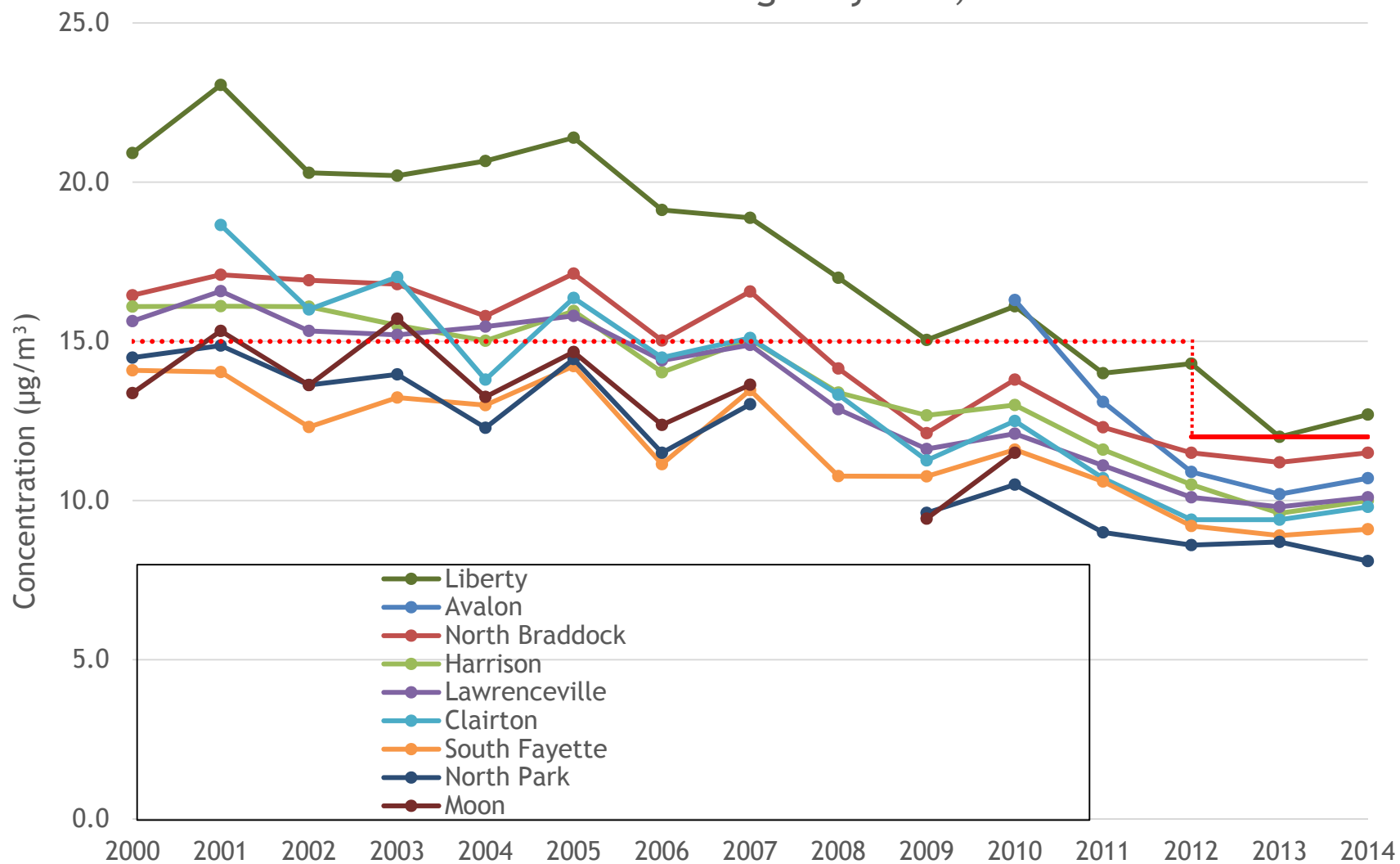
- Solid matter or liquid droplets suspended in the air
- Sources include diesel engines, power plants, windblown dust, wood stoves, etc.
- The smaller the particles, the deeper into the lungs they can go
- Affects visibility and precipitation patterns, soils buildings, vehicles, outside materials





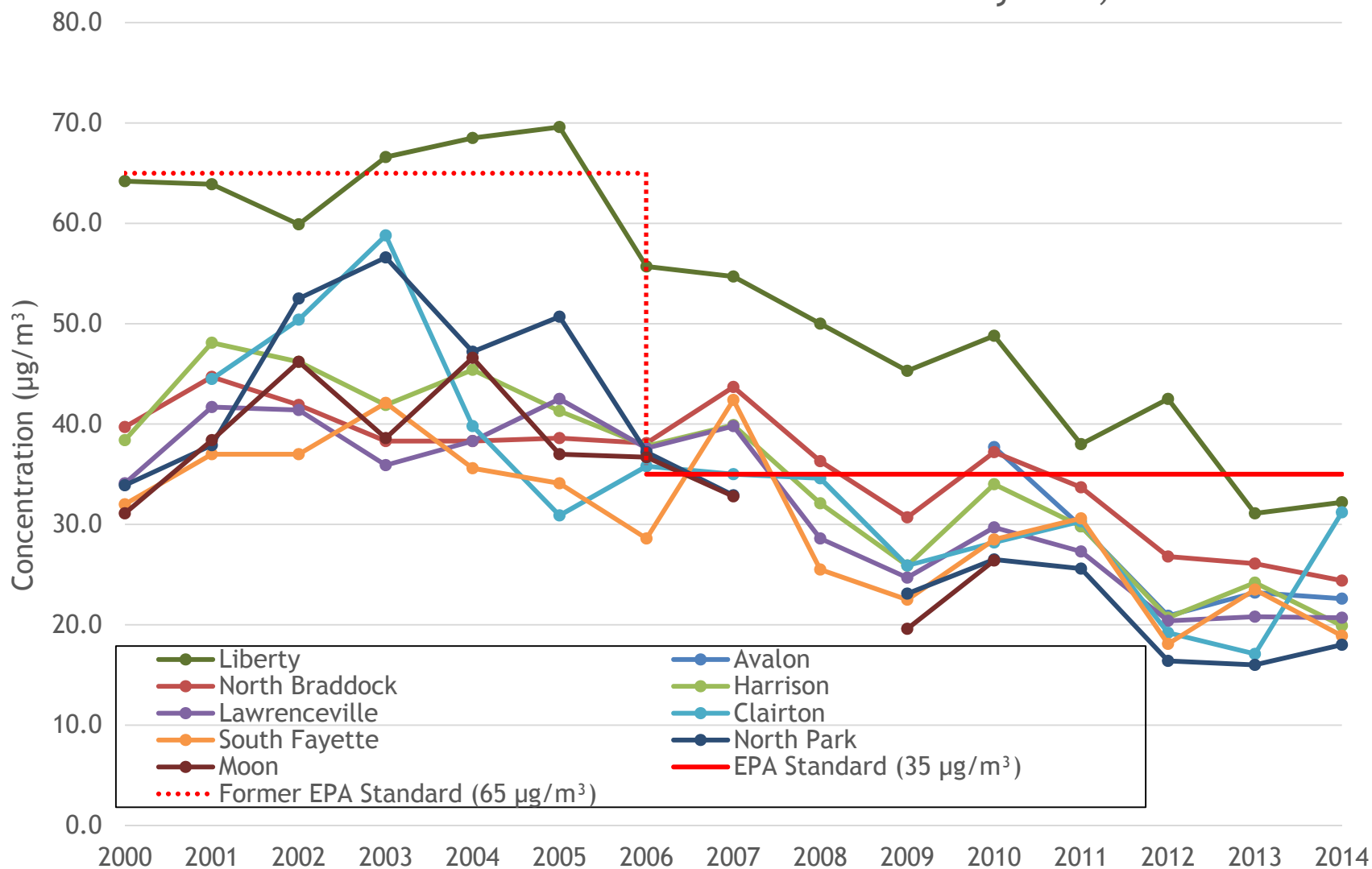


## PM2.5 Annual Averages by Year, 2000 to 2014





## PM2.5 24-Hour 98th-Percentile Values by Year, 2000 to 2014







## *Ozone: Ground-level or Tropospheric*

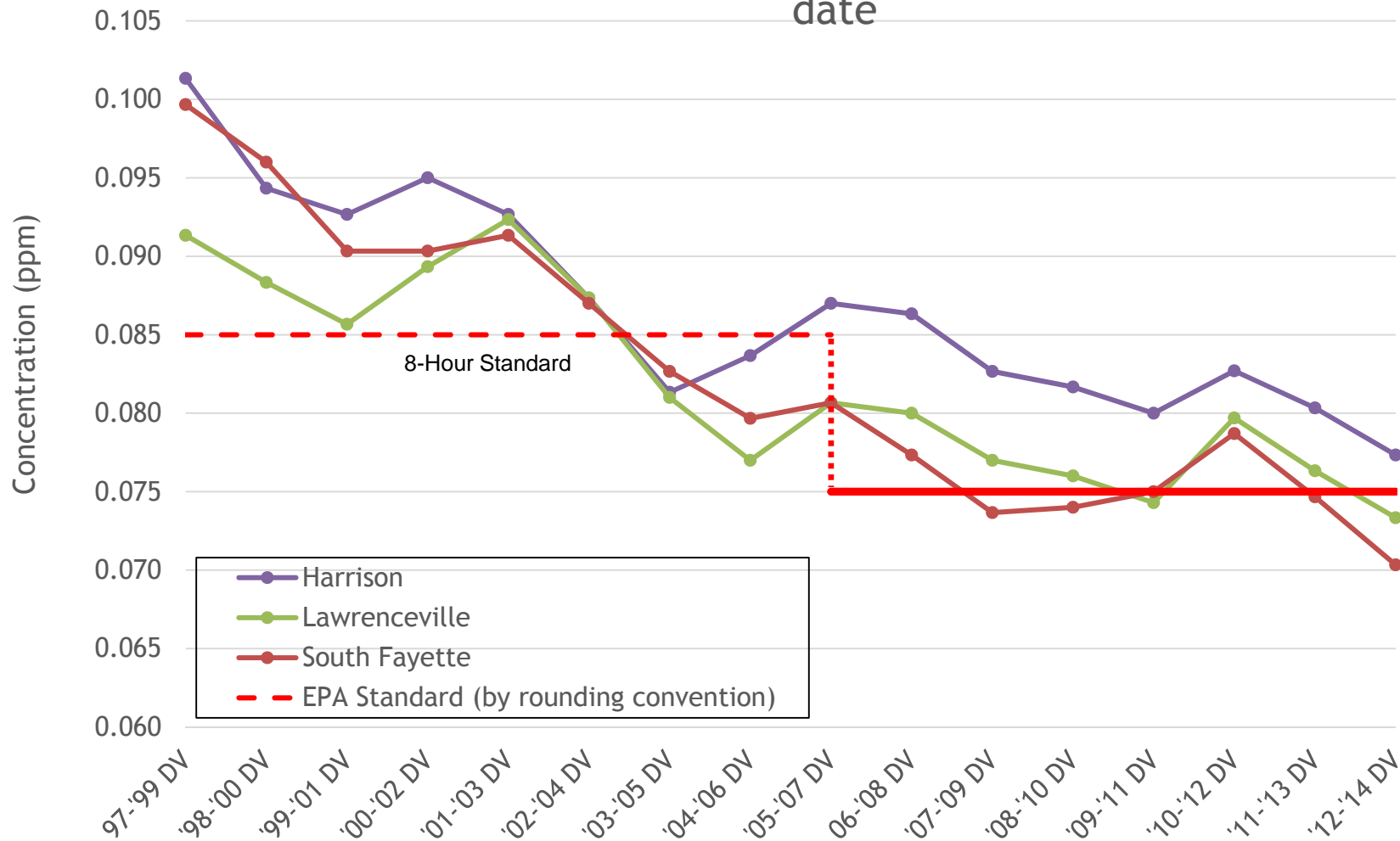
- Colorless gas compound made up of three oxygen atoms
- Secondary pollutant formed *near the ground* by reactions between oxygen, volatile organic compounds and nitrogen oxides in the presence of sunlight
- Primary component in smog
- Causes respiratory problems, damages plants and deteriorates paints and finishes



- Ozone is almost exclusively a secondary pollutant.



## 8-Hour Ozone Design Values, ACHD Sites, 1997 to 2014 to date







## *Lead*

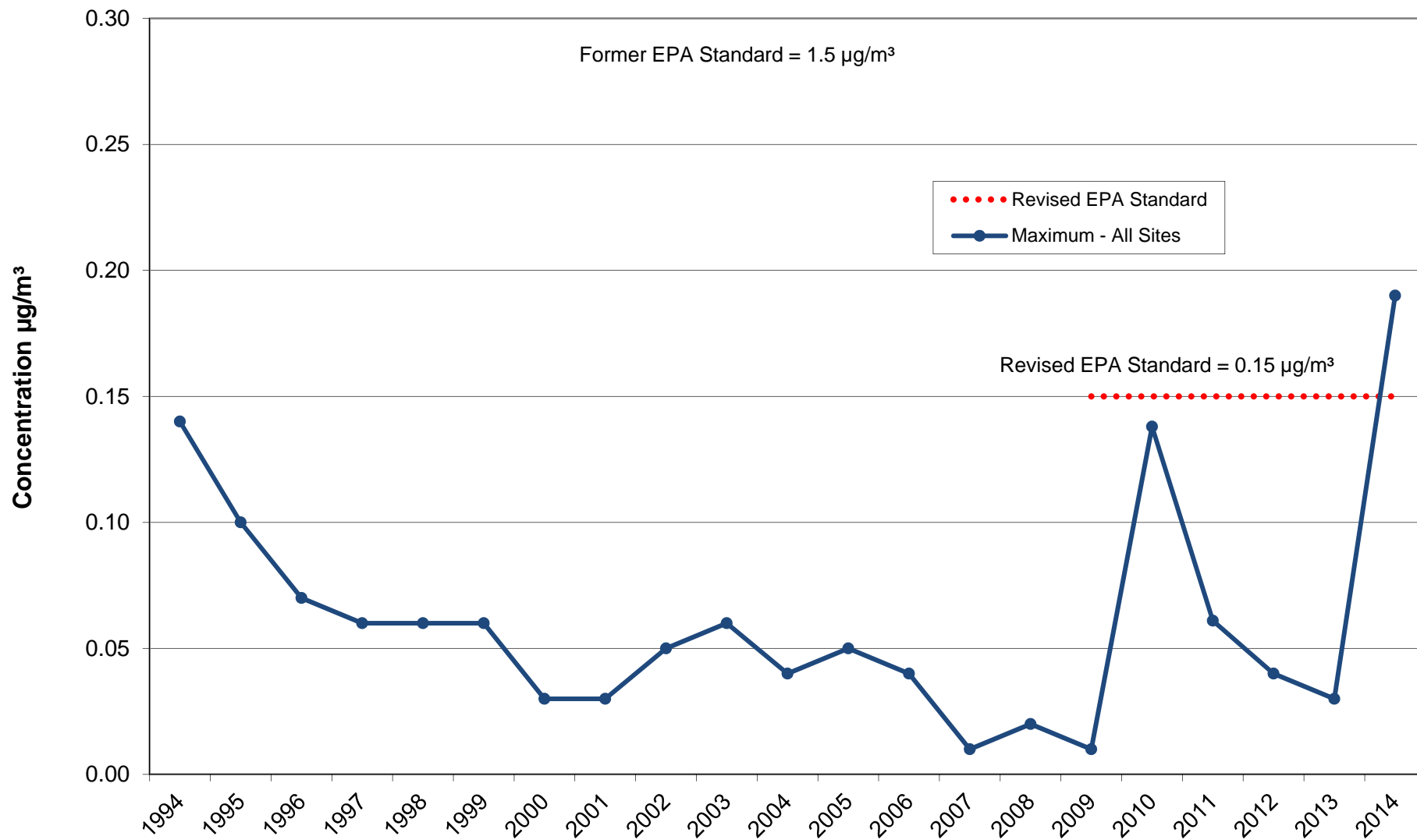
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- **Metallic element that is a particulate pollutant and toxic to humans**
- **Sources include vehicles burning leaded gas, metal refineries and power plants burning fossil fuels**
- **Not easily removed from the body and can accumulate in bones and tissues**
- **Children are more vulnerable to its effects**
- **Does not effect materials**





## Lead (Pb) Maximum, 1994-2014







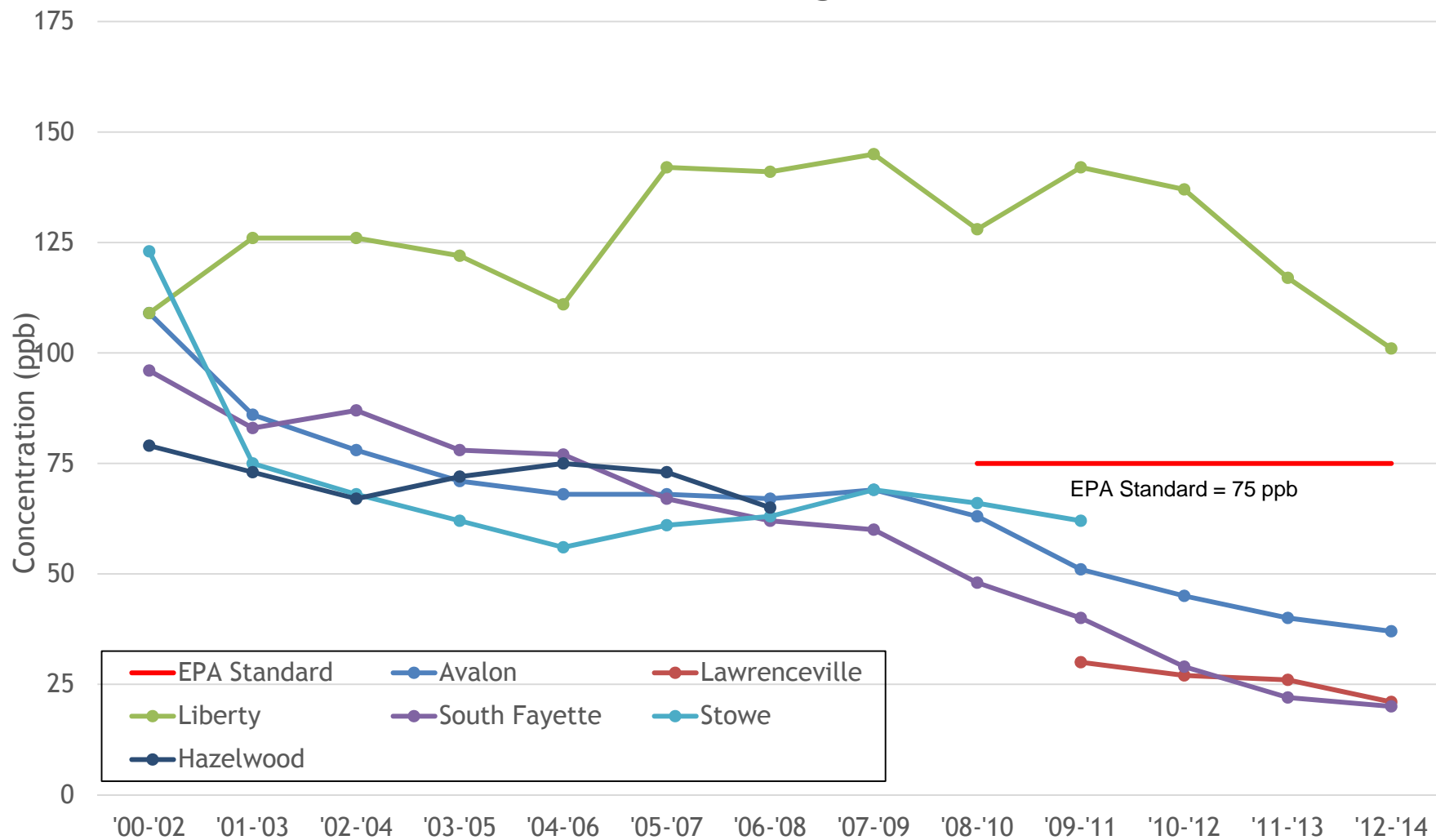
## *Sulfur Dioxide*

- Colorless gas compound made up of sulfur and oxygen
- Sources include coal-burning power plants and industries, coal-burning stoves and refineries
- Irritates respiratory system
- Combines with particulate matter or moisture, contributes to acid rain





## Sulfur Dioxide 1-HR Design Values, 2000 to 2014



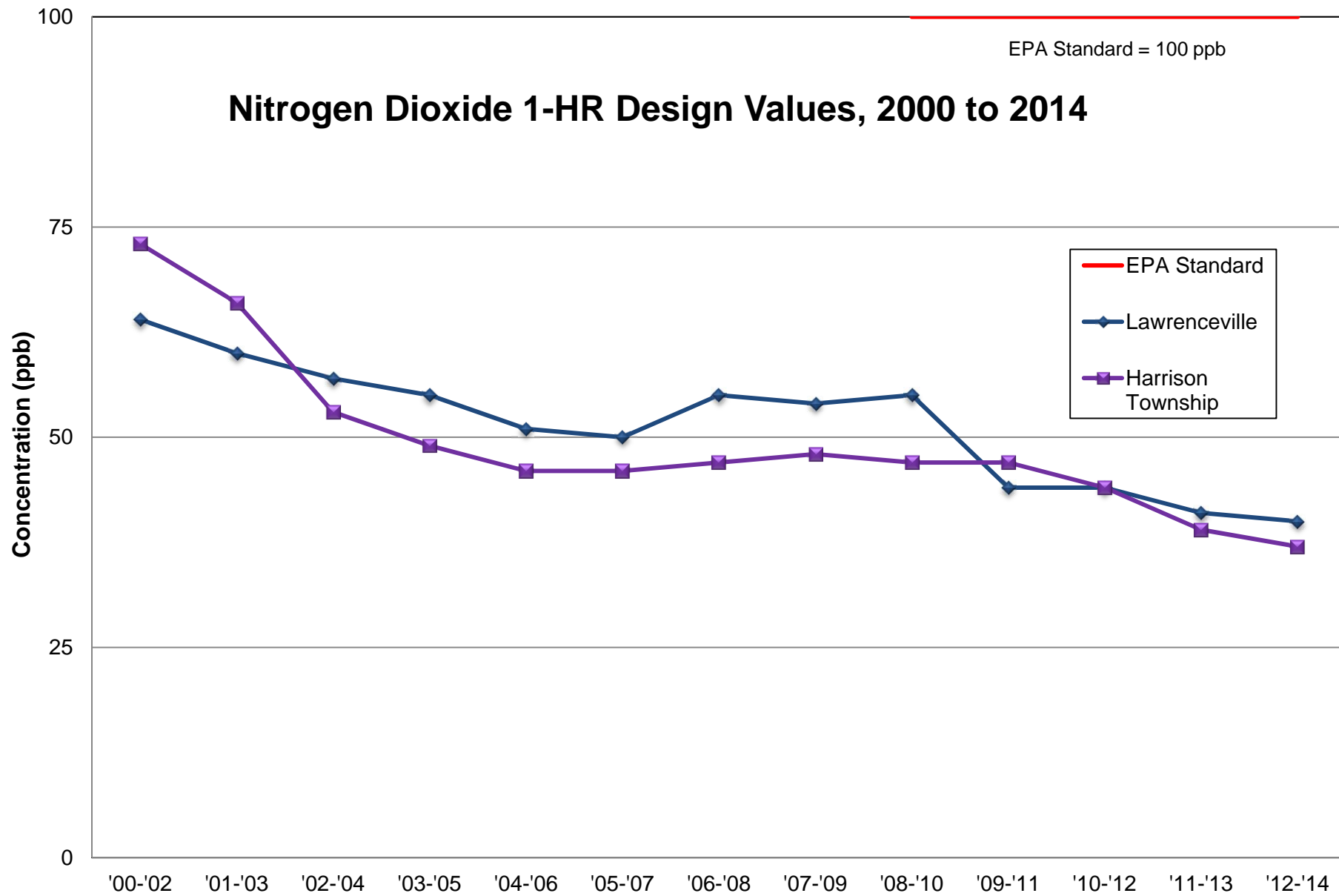




# *Nitrogen Oxides*

- Light brown gas compound made up of nitrogen and oxygen
- Sources include motor vehicles, coal-burning power plants and coal-burning stoves
- Irritates respiratory system
- Component in the formation of ozone (smog) and acid rain









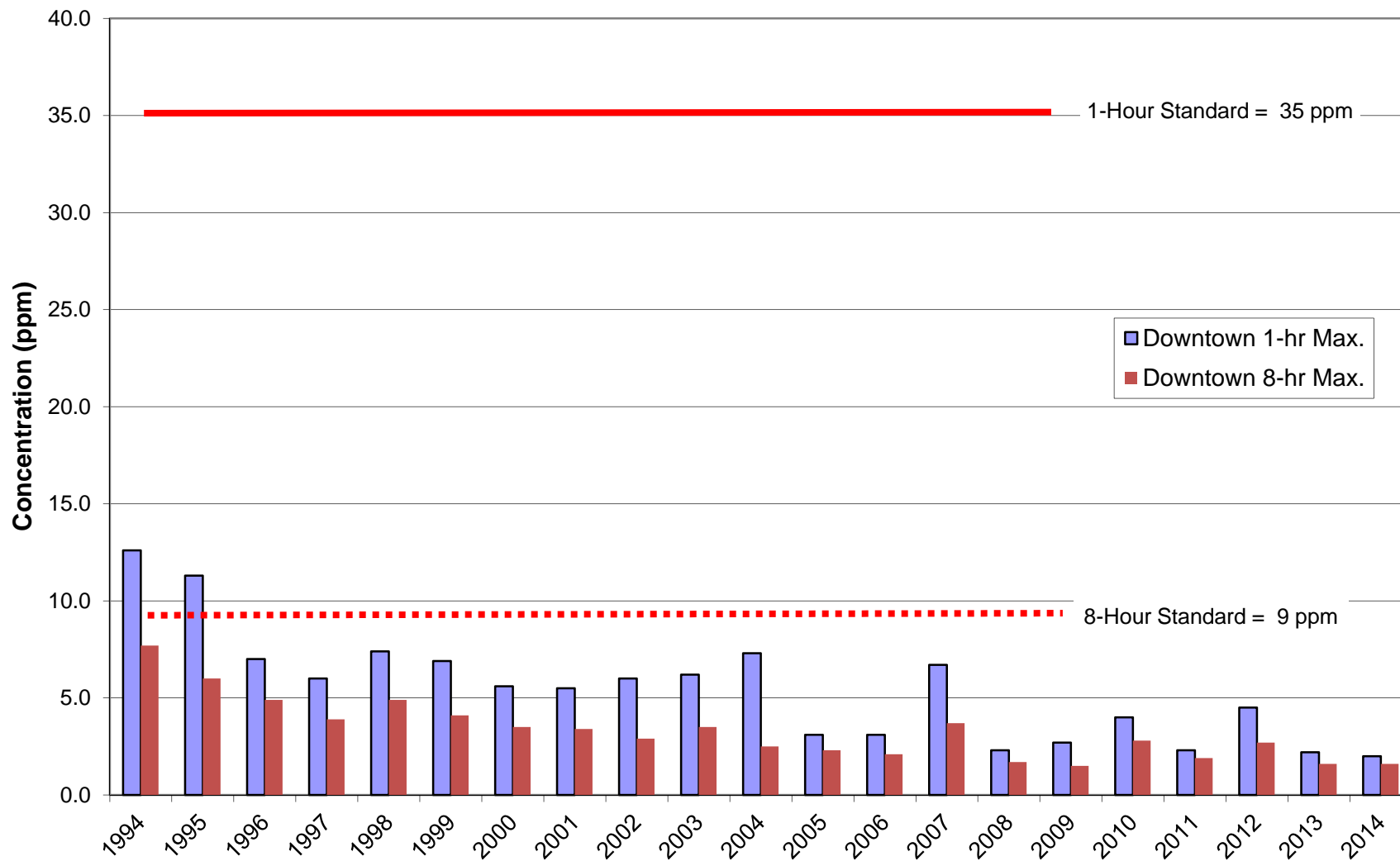
## *Carbon Monoxide*

- Colorless, odorless gas made up of carbon and oxygen
- Produced by incomplete burning of fossil fuels, wood or other carbon-containing materials
- Sources include motor vehicles and kerosene or wood-burning stoves
- Hinders the ability of blood to carry oxygen
- Can cause dizziness and fatigue; may cause death at high levels





## Carbon Monoxide 1-Hour and 8-Hour Maximum Trends, 1994-2014





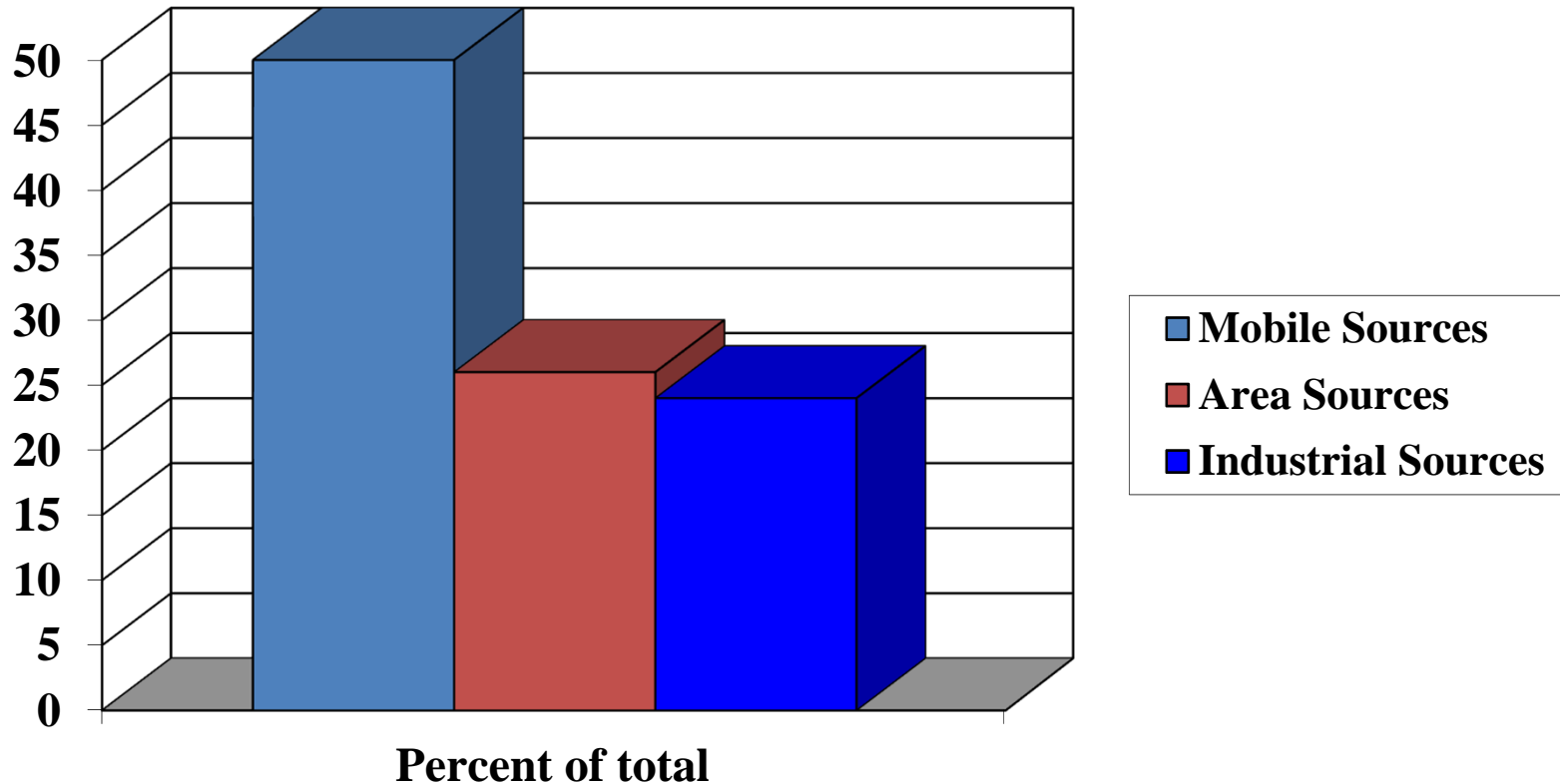


## Air Toxics (HAPS)

Those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. EPA is working with state, local, and tribal governments to reduce air toxics releases of 187 pollutants to the environment.



# Where do Air Toxics Come From?







# Air Toxics in Allegheny County (No NAAQS for HAPS)

- Benzene, Toluene, Ethyl Benzene, Xylene (BTEX)
- Styrene
- Acrolein
- Formaldehyde
- Manganese, Hexavalent Chromium, Lead, Mercury
- Asbestos



# Special Studies

- Lawrenceville HAP Metals Study (2011 - Present)
- Highland High School Metals Study (2008-2010)
- CMU Pittsburgh Air Toxics Study (2006-2007)

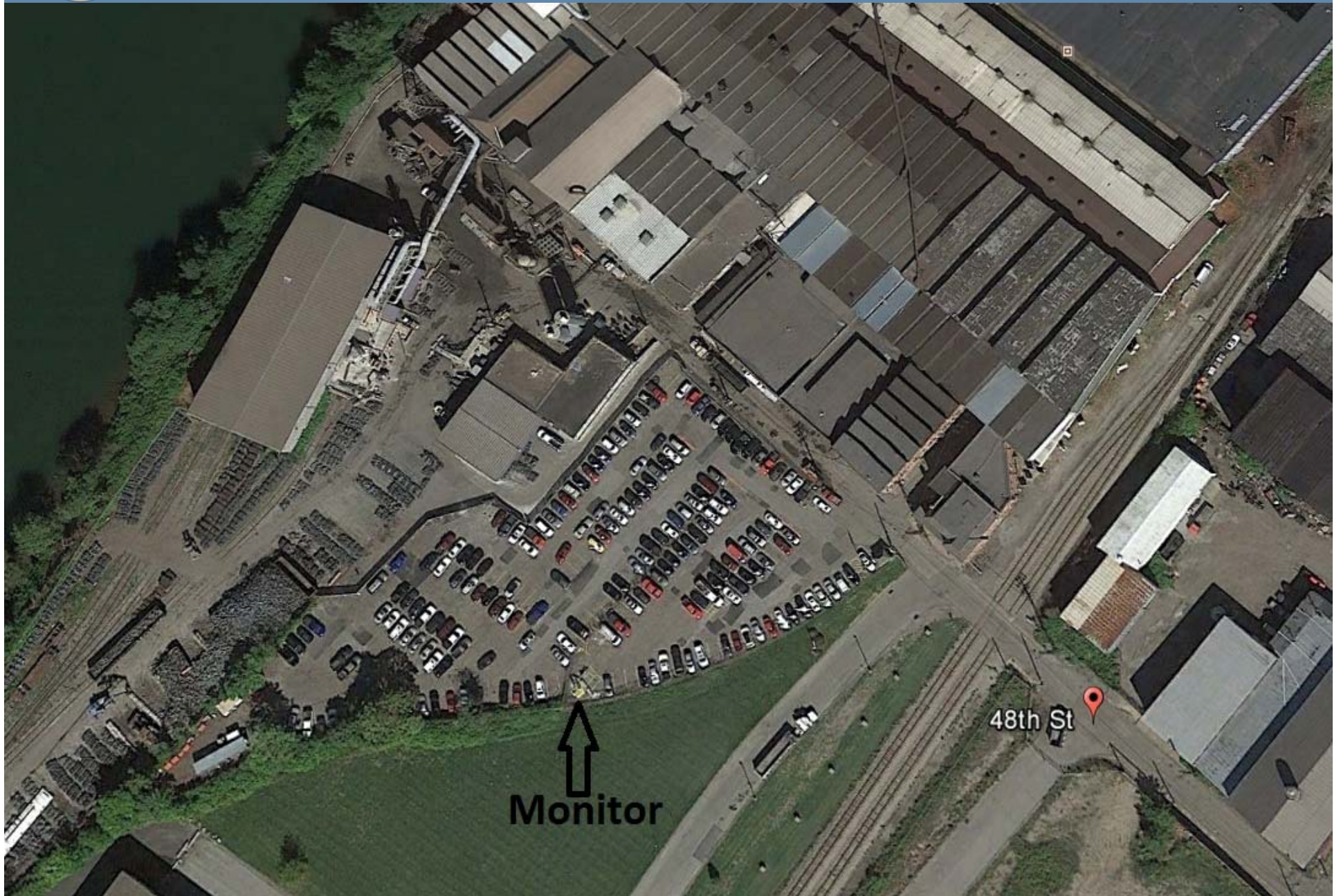
<http://www.achd.net/air/reports.html>

- School Air Toxics (Sto-Rox, Clairton, S. Allegheny)  
(2009, 2011)
  - Key Pollutants; Benzene, Arsenic, BaP

<http://www.epa.gov/schoolair/>



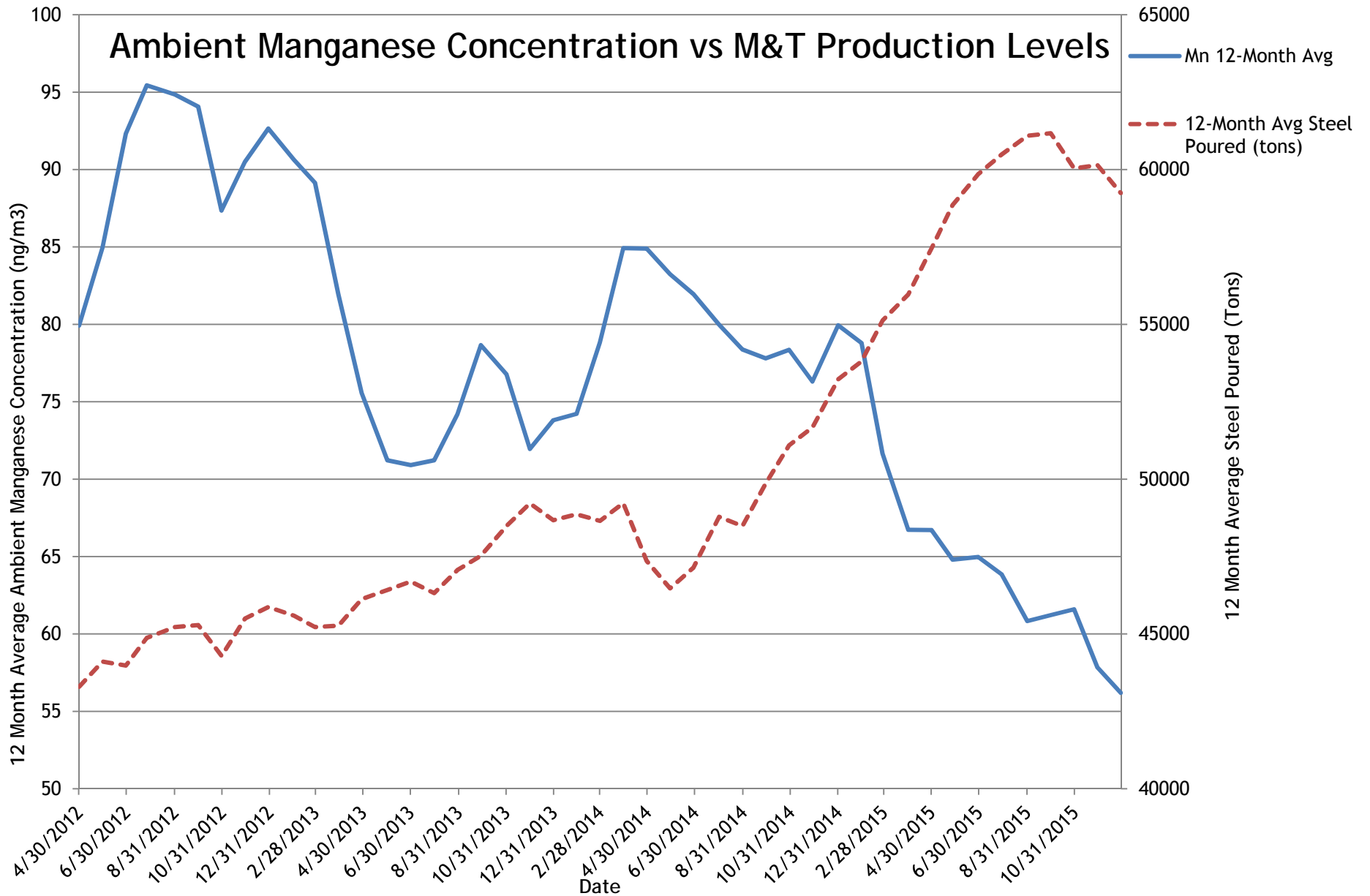
# Allegheny County Health Department



Monitor

48th St







# McConway & Torley Overview

- Steel Foundry that manufactures railroad castings
- Melting Operations:
  - Scrap metal melted in two (2) Electric Arc Furnaces.
  - Molten steel tapped into ladle and transferred to pour area.
  - Molten steel poured into sand molds with phenolic resin cores to create shapes/voids.
- Mold/Core Operations
  - Molds made from compressed sand.
  - Cores made from a 99% sand and 1% resin mixture.
  - Shakeout: releases casting from mold.
- Finishing Operations: grinding and sand blasting.



# McConway & Torley Pollution Control Devices

- 7 Baghouses to capture/collect filterable particulate matter and metals.
- 2 Scrubbers to control odors from core-making operations.
- Total Building Enclosure:
  - Cumulative air flow from the 7 baghouses creates a negative pressure differential inside the building.
  - All air exiting from the building goes through 1 of the 7 baghouses.





# M&T Permitting Overview

- 9 issued and 2 pending Installation Permits over the last 20 years.
- Operating Permit drafted and submitted for public comment in January & March of 2015:
  - Total Building Enclosure was not proven by M&T until May of 2015.
  - Significantly changes emissions estimates.
  - Allows for measurement of fugitive (uncaptured) emissions sources such as pouring/cooling operations, which are currently unknown.



# M&T Going Forward

- Department is working with M&T to devise a facility-wide (7 baghouses) test for:
  - Carbon Monoxide (CO)
  - Volatile Organic Compounds (VOC)
  - Hazardous Air Pollutants:
    - BTEX (Benzene, Toluene, Ethyl Benzene, Xylene)
    - Phenol
    - Cresol
    - Naphthalene
- Results of testing will be used to estimate total facility emissions and set emission limits & production levels for the Operating Permit.





# Thank you!

## David D Good

Air Pollution Control Permitting Manager  
Allegheny County Health Department

[dgood@achd.net](mailto:dgood@achd.net)

[www.achd.net](http://www.achd.net)