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# Cleaning Louisiana's Air: Understanding Air Quality Standards

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# Clean Air Act of 1990

- Federal Law established by the Environmental Protection Agency (EPA)
- State Agencies (Louisiana Department of Environmental Quality) carry out the Act

# Clean Air Act of 1990

- Criteria Pollutants – National Ambient Air Quality Standards (NAAQS)
- Permissible Levels (Primary Standard and Secondary Standard)
- Attainment vs. Non-Attainment Areas and Classifications
- State Implementation Plan (SIP)

# National Ambient Air Quality Standards (NAAQS)

## CRITERIA

## POLLUTANTS

1. Ozone
2. Particulate Matter
3. Sulfur Dioxide
4. Nitrogen Dioxide
5. Lead
6. Carbon Monoxide

❖ These standards are designed to protect public health with an adequate margin of safety.

❖ All states must work to achieve these standards through the SIP process.

# Air Planning Activities

- First and foremost, to apply the Clean Air Act of 1990 and subsequent revisions, to air quality issues in the state.
- Write the necessary state implementation plans (SIPs) to correct NAAQS exceedances or to adhere to newly revised NAAQS
- Work with stakeholders to bring nonattainment areas into attainment.

# Air Quality Standards

- EPA establishes the National Ambient Air Quality Standard (NAAQS) for each of the [criteria pollutants](#).
- There are two types of standards -- primary and secondary.

# Primary/Secondary Standards

- Primary standards protect against adverse health effects;
- Secondary standards protect against welfare effects, such as damage to farm crops and vegetation and damage to buildings.



# NAAQS Defined

Pollutant	Primary Standards	Averaging Times
Carbon Monoxide	9 ppm	8-hour
	35 ppm	1-hour
Lead	0.15 µg/m <sup>3</sup>	Rolling 3 month average
Nitrogen Dioxide	53 ppb	Annual Mean
	100ppb	98 <sup>th</sup> percentile of 1-hour daily maximum concentration over 3 yrs.
Particulate Matter (PM <sub>10</sub> )	150 µg/m <sup>3</sup>	24-hour
Particulate Matter (PM <sub>2.5</sub> )	12.0 µg/m <sup>3</sup>	Annual Mean
	35 µg/m <sup>3</sup>	24-hour
Ozone	70 ppb	8-hour
Sulfur Oxides	75 ppb	99 <sup>th</sup> percentile of 1-hr daily max concentrations, averaged over 3 yrs.

# Carbon Monoxide (CO)

- **Carbon Monoxide (CO) Pollution in Outdoor Air**
- The greatest sources of CO to outdoor air are cars, trucks and other vehicles or machinery that burn fossil fuels.



# Lead (Pb)

- Lead in the air is regulated two ways under the Clean Air Act:
- As one of six common pollutants for which EPA has issued [national ambient air quality standards \(NAAQS\)](#), and
- As a [toxic air pollutant](#) (also called a hazardous air pollutant) for which industrial facility emissions are regulated.
- Under the lead NAAQS, EPA limits how much lead there can be in the ambient (outdoor) air. EPA specifies requirements for the siting of monitoring stations to ensure compliance with the NAAQS. EPA also publishes guidelines for state, local and tribal permitting authorities to guide development of NAAQS state implementation plans (SIPs). In addition, EPA's [New Source Review permitting programs](#) require any large new or modified stationary source to get a permit before it begins construction.
- EPA also regulates lead as a toxic air pollutant by limiting the emissions that come from some industrial sources. The regulations that limit toxic air pollutant emissions are called National Emission Standards for Hazardous Air Pollutants, or NESHAPs. Two regulations that focus on limiting lead emissions are the NESHAPs for [Primary Lead Smelting](#) and [Secondary Lead Smelting](#). Other [NESHAPs](#) control lead that is emitted along with other toxic air pollutants.

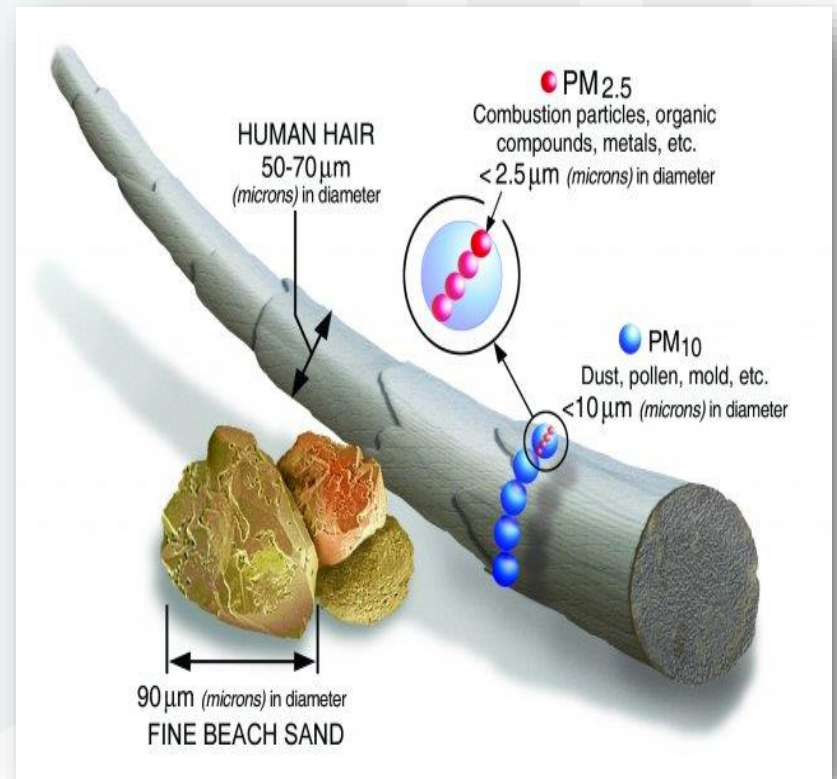
# Nitrogen Dioxide NO<sub>2</sub>

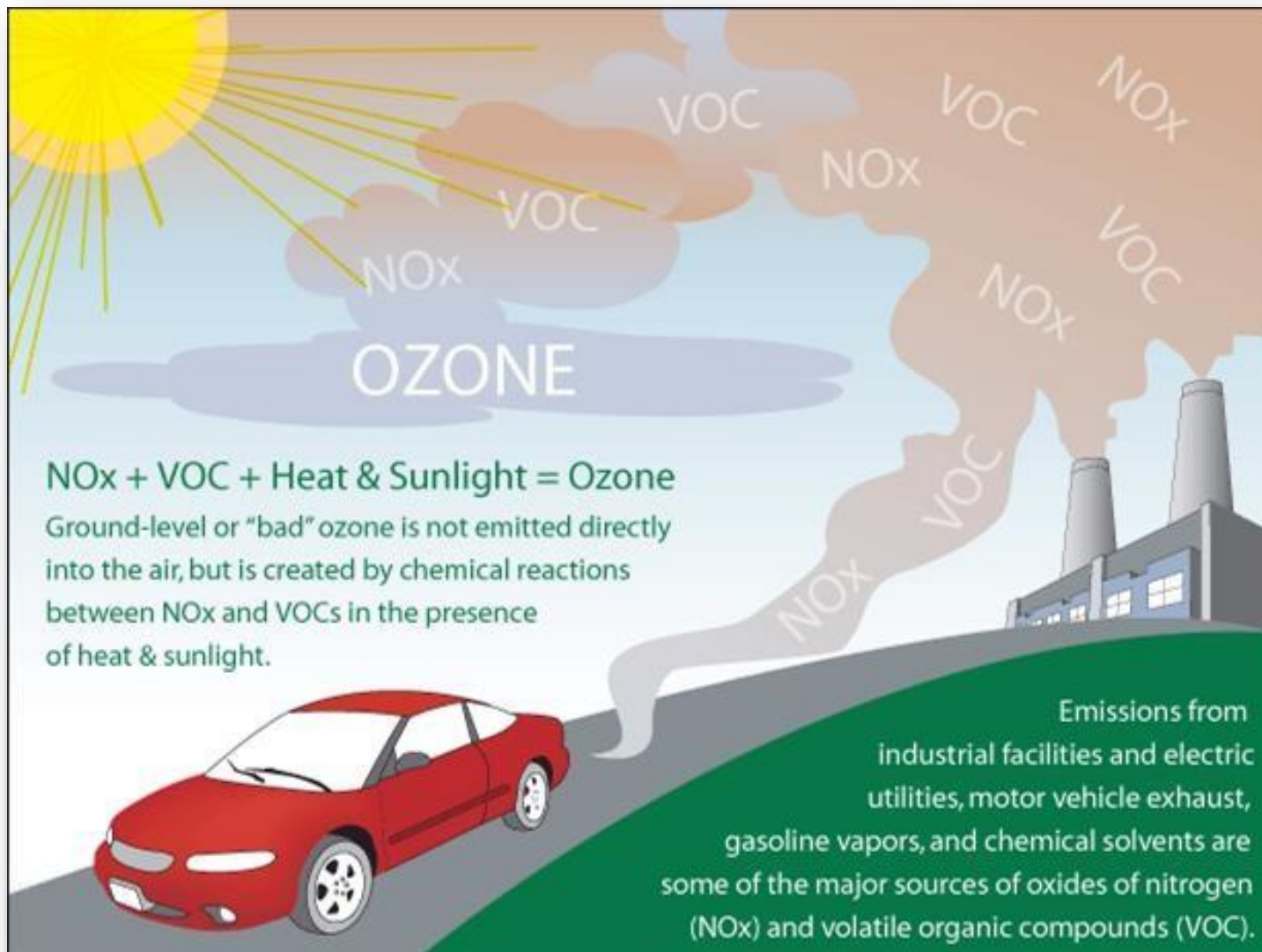
- NO<sub>2</sub> primarily gets in the air from the burning of fuel. NO<sub>2</sub> forms from emissions from cars, trucks and buses, power plants, and off-road equipment.



# Particulate Matter PM<sub>2.5</sub> and PM<sub>10</sub>

- PM stands for particulate matter (also called particle pollution): the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope.
- Particle pollution includes:
  - **PM<sub>10</sub>**: inhalable particles, with diameters that are generally 10 micrometers and smaller; and
  - **PM<sub>2.5</sub>**: fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.
    - How small is 2.5 micrometers? Think about a single hair from your head. The average human hair is about 70 micrometers in diameter – making it 30 times larger than the largest fine particle.





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

**What is SO<sub>2</sub> and how does it get in the air?**

- **What is SO<sub>2</sub>?**
- EPA's national ambient air quality standards for SO<sub>2</sub> are designed to protect against exposure to the entire group of sulfur oxides (SO<sub>x</sub>). SO<sub>2</sub> is the component of greatest concern and is used as the indicator for the larger group of gaseous sulfur oxides (SO<sub>x</sub>). Other gaseous SO<sub>x</sub> (such as SO<sub>3</sub>) are found in the atmosphere at concentrations much lower than SO<sub>2</sub>.
- Control measures that reduce SO<sub>2</sub> can generally be expected to reduce people's exposures to all gaseous SO<sub>x</sub>. This may have the important co-benefit of reducing the formation of particulate sulfur pollutants, such as fine sulfate particles.
- Emissions that lead to high concentrations of SO<sub>2</sub> generally also lead to the formation of other SO<sub>x</sub>. The largest sources of SO<sub>2</sub> emissions are from fossil fuel combustion at power plants and other industrial facilities.
- **How does SO<sub>2</sub> get in the air?**
- The largest source of SO<sub>2</sub> in the atmosphere is the burning of fossil fuels by power plants and other industrial facilities. Smaller sources of SO<sub>2</sub> emissions include: industrial processes such as extracting metal from ore; natural sources such as volcanoes; and locomotives, ships and other vehicles and heavy equipment that burn fuel with a high sulfur content.

## Carbon calciner facility



# Air Quality Index



AQI Values	Air Quality	Protect Your Health
0-50	Good	No health impacts are expected when air quality is in this range.
51-100	Moderate	Unusually sensitive people should consider limiting prolonged outdoor exertion.
101-150	Unhealthy for Sensitive Groups	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
151-200	Unhealthy	Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.
201-300	Very Unhealthy	Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.





# Attainment/Nonattainment

- A geographic area that meets or does better than the national ambient air quality standard is called an **attainment area**; an area that doesn't meet this standard is called a **nonattainment area**.

# What is included in a SIP?

- The contents of a typical SIP fall into three categories:
- State-adopted control measures which consist of either state statutes and regulations or source-specific requirements (such as orders and consent decrees)
- State-submitted "non-regulatory" components (see list of examples below);
- Additional requirements promulgated by EPA to satisfy a mandatory requirement in Section 110 or Part D of the Clean Air Act.

# What is included in a SIP?

Examples of EPA-approved documents and materials associated with the SIP include, but are not limited to:

- SIP Narratives
- Infrastructure plans providing for general implementation of a NAAQS
- NAAQS-specific Part D Nonattainment Area Plans
- Maintenance plans
- Vehicle Inspection and Maintenance (I/M) Plans
- Emissions Inventories
- Monitoring Networks
- State Statutes submitted for the purposes of demonstrating legal authority
- Permitting programs
- Attainment Demonstrations
- Transportation Control Measures (TCMs)
- Contingency Measures
- 15% Rate of Progress Plans
- Emergency Episode Plans
- Visibility Plans

# Is the public able to comment on a SIP?

- Yes! The state must publish a Potpourri Notice in the Louisiana Register when a SIP is being proposed.
- We invite everyone to read and ask questions or voice concerns on the control measures contained in the SIP.
- Public hearings are not always scheduled; however, one will be scheduled if requested.

# State Regulations

- State regulations are put into place to maintain some of the items included in the SIP, especially the permitting programs.
- Louisiana's Air Regulations for permitting are contained in LAC 33:III

# Redesignation to Attainment

- Areas that are designated nonattainment must be “redesignated” once the area reaches attainment of the NAAQS or certain criteria pollutant.
- The state will submit two documents:
  - Request for Redesignation
  - Maintenance Plan

# Air Assessment and Planning

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# Resources

- <http://www.deq.louisiana.gov>
- <https://www.epa.gov/criteria-air-pollutants>
- <https://www.epa.gov/ground-level-ozone-pollution>
- <https://www.epa.gov/pm-pollution>
- <https://www.epa.gov/co-pollution>
- <https://www.epa.gov/lead-air-pollution>
- <https://www.epa.gov/so2-pollution>
- <https://www.epa.gov/no2-pollution>





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