

Air Quality 101

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Overview

- Air Quality Basics
 - Nonattainment Areas
 - Maritime Industry Sources
 - SIPs
 - Federal Conformity
 - Front Line Ports
 - Air Quality – The Future
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Air Quality – In the Beginning

- Original Clean Air Act (CAA) in early 1970's
- Established:
 - “Criteria Pollutants”
 - Ambient Standards
- Required States to Develop:
 - Regulations to Meet Standards (or Better)
 - A Plan to Implement these Regulations

The State Implementation Plan (SIP) was Born

Air Quality - The Middle

- 1990 CAA Amendments (CAAA)
 - Strengthened Existing Provisions
 - Added Air Toxics and Acid Rain Provisions
 - Moderate, Serious, & Severe Nonattainment Areas Were Identified

NAAQS - Criteria Pollutants

- Based on Scientific Health Effects Criteria (hence the name)
 - Ozone (NO_x & VOC)
 - Particulate Matter (PM₁₀)
 - Carbon Monoxide
 - Sulfur Dioxide (SO₂)
 - Nitrogen Dioxide – No Existing Nonattainment Areas
 - Lead – No Existing Nonattainment Areas
- Ozone Formed in the Lower Atmosphere by Reaction of Organic Compounds with NO_x in Sunlight

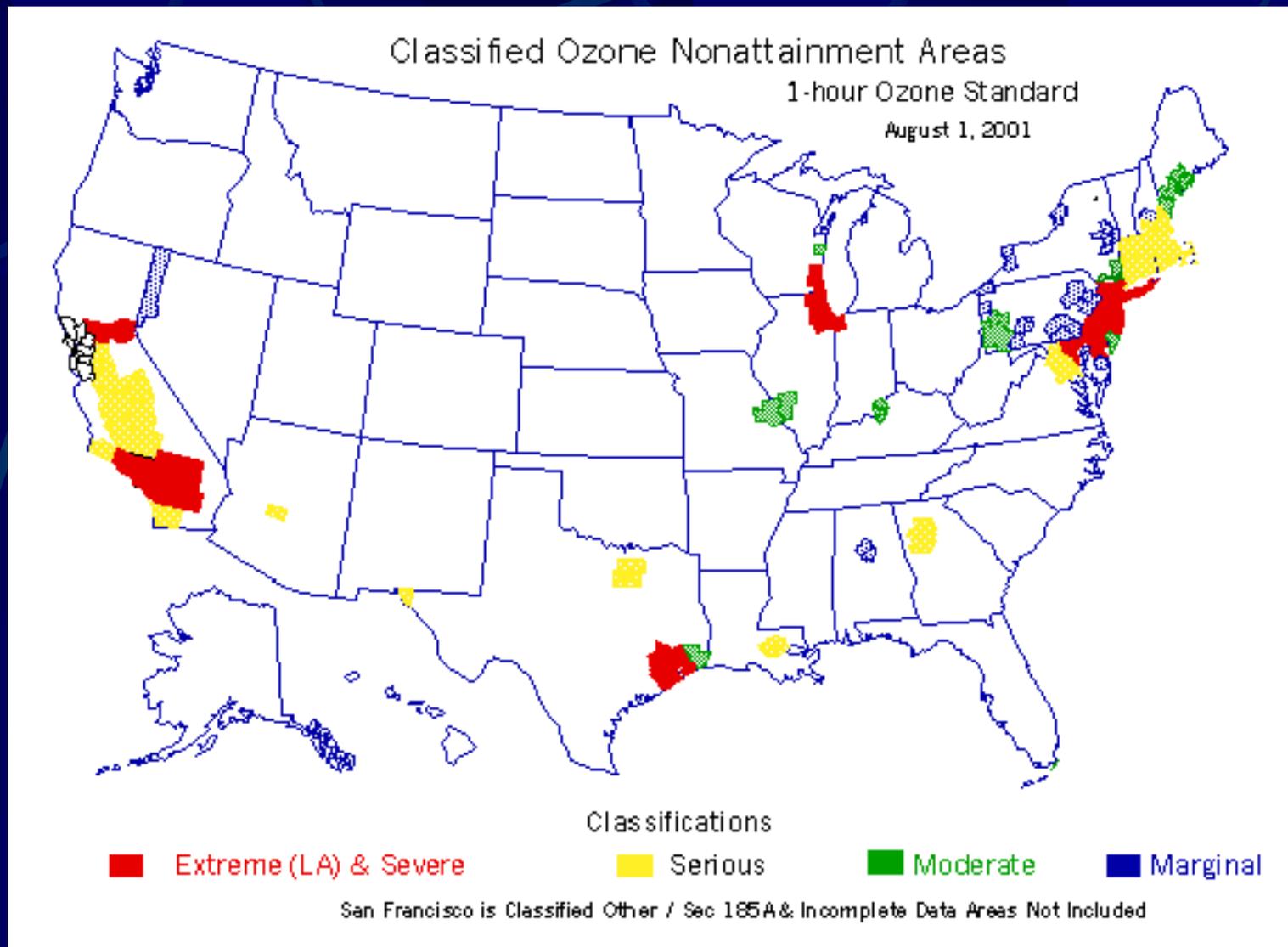
National Ambient Air Quality Standards (NAAQS)

- Standards for Each Criteria Pollutant
- Short Term (Daily Average or Shorter)
- Long Term (Annual Average)
- Primary - Health Based
- Secondary - Welfare/Property-Based
- States Monitor Air Quality to Determine Compliance with NAAQS

Air Pollution Control Regulations

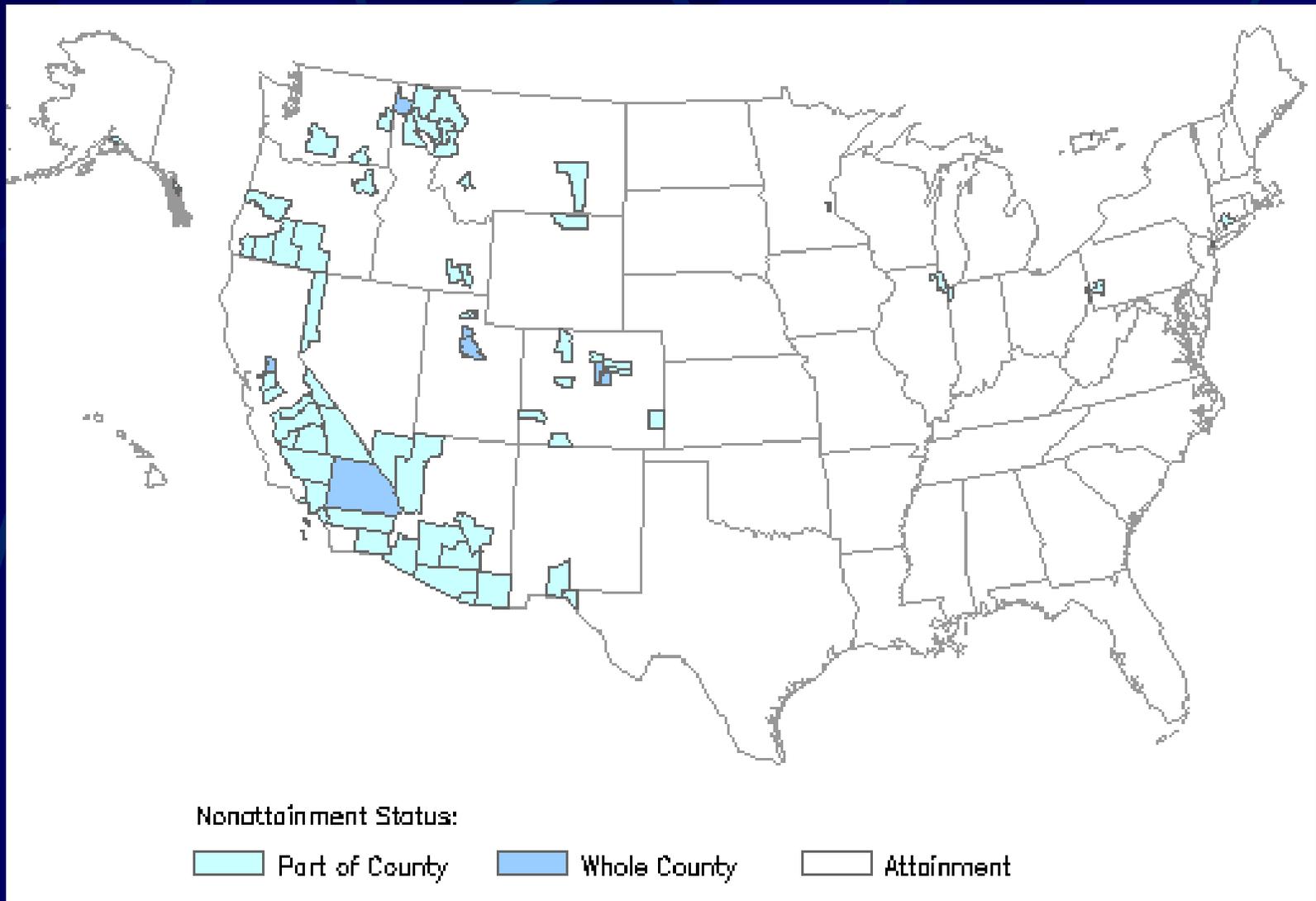
- Areas that Do Not Meet NAAQS are Classified as “Nonattainment Areas”
- Regulations are Designed to Attain NAAQS in Nonattainment Areas
- States & EPA Can Enact Regulations Covering Industrial and Commercial Emission Sources
- EPA Alone can Regulate Internal Combustion Engines that Power Mobile Sources

Ozone Nonattainment Areas



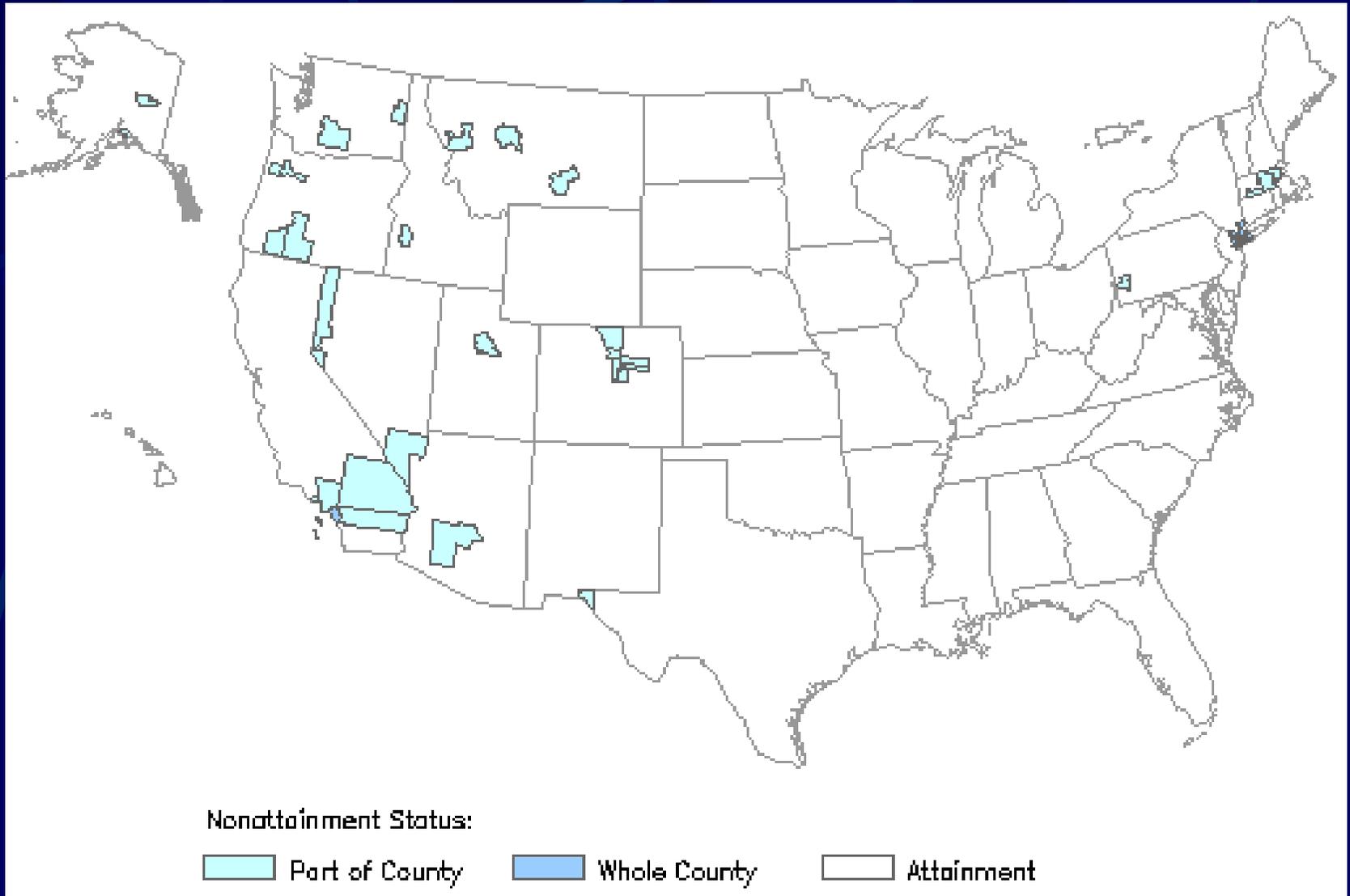
Source: EPA Office of Air & Radiation, AIR Database

PM₁₀ Nonattainment Areas



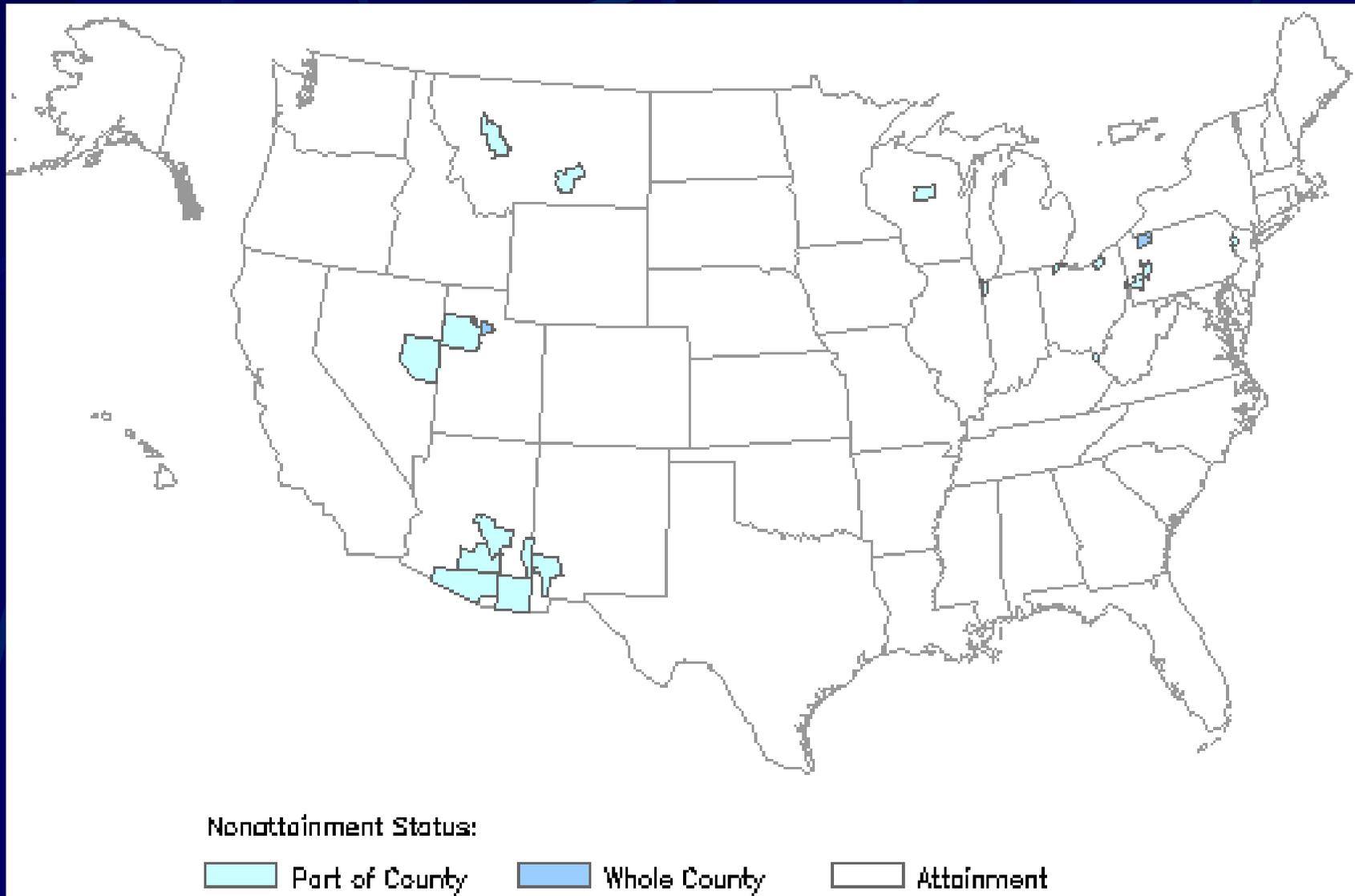
Source: EPA Office of Air & Radiation, AIR Database

CO Nonattainment Areas



Source: EPA Office of Air & Radiation, AIR Database

SO₂ Nonattainment Areas



Source: EPA Office of Air & Radiation, AIR Database

Maritime Industry Sources - Mobile

- Onroad Examples
 - Heavy Duty Diesel Trucks
 - Autos, Trucks, Vans
 - Every Vehicle That has a License Plate
- Nonroad Examples
 - Marine (OGVs, Ferries, Dredges, Towboats, Excursion, Fishing Boats, etc.)
 - Construction and Industrial Equipment - Cargo Handling Equipment
 - Mining
 - Agriculture

Mobile Sources (cont'd)

- Onroad Sources Were Historically the Focus of EPA Regulations
- Nonroad Land-Based and Small to Medium Marine-Based Engines Were Historically Unregulated by EPA

State Implementation Plan (SIP)

- State-Wide Plan to Improve Air Quality
- Details What Regulations Will be Enacted, Where They Will Apply, & When
- Explains How the Regulations Will Improve Air Quality
- Computer Modeling to Show Attainment by Target Dates
- States Can Not Regulate All Sources

SIP (cont'd)

- Many Original Attainment Dates Were Not Met
- SIPs Have Been Revised Many Times Since the 1970's
- CAA Amendments (CAAA) of 1990 set Another Round of Deadlines
- EPA Regional Office Approves or Disapproves
- Public Comment Process
- Anyone can Sue Against a SIP

A SIPs Work is Never Done

- Even After Approval from EPA, SIPs are Constantly Being ‘Tweaked’
 - Revised Emissions Inventories
 - New Emissions Models
 - “Mid Course” Corrections
 - New NAAQS (8hr Ozone, Fine PM)
- Once an Area is Redesignated as Attainment then Comes the 10 year Maintenance Plan

When SIPs Fail

- SIP Fails to Show Attainment or Misses a Milestone ⇒ Federal Implementation Plan (FIP)
- Developed at EPA Regional Office
- Sanctions Typically Can Include:
 - Federal Highway Construction Funding Cut Off
 - Increase Permit Offsets for New Sources
 - No New Air Quality Permits
 - Pain & Misery, Death & Famine

Federal Conformity

- CAA Amendments of 1990 also Introduced the Conformity Requirements
- Designed to Ensure That the Federal Government does not take “Actions” That Interfere With a State’s SIP
- Applies to Only to Nonattainment Pollutants
- Conformity Covers Two Types of Actions:
 - Transportation Actions
 - General Actions

Transportation Conformity

- Sets 'Not to Exceed' Limits in the SIP for Transportation Improvement Plans (TIPs)
- Generally Developed by the MPO
- Deals with Onroad Transportation Sources (cars, highway trucks, etc.)
- Projects Funded by FHWA

General Conformity

- CAAA Provision for Federal Actions (FA) in Non-Attainment Areas
- FA – Permit, Funding, New Facilities, etc
- Federal Agency Evaluates Direct & Indirect Emissions Associated w/FA
- FAs Can Not Impinge on SIP

General Conformity (cont'd)

- Direct Emissions – Those Emissions that are Directly Associated with the FA
- Indirect Emissions – Those Emissions that Occur in Support of the FA
- Maintenance Dredging Exempted!!!

General Conformity (cont'd)

- Trigger Levels

- Nonattainment Areas

	Ozone (VOC/NOx)	CO/SO ₂	PM ₁₀
➤ Extreme:	10 tpy	100 tpy	-
➤ Severe:	25 tpy	100 tpy	-
➤ Serious:		50 tpy	100 tpy
	70 tpy		
➤ Marginal & Moderate:	50/100 tpy	100 tpy	100 tpy

General Conformity (cont'd)

- Trigger Levels
 - Maintenance Areas

Ozone/SO₂
(NO_x)

100 tpy

Ozone
(VOC)

50/100 tpy

CO

100 tpy

PM₁₀

100 tpy

General Conformity (cont'd)

- Exceeding Trigger Level \Rightarrow Conformity Determination \Rightarrow Pain & Delay
- Options for Meeting Conformity
 - All Pollutants:
 - SIP Line Item
 - Ozone & NO₂:
 - No Net Increase in Emissions (1:1 offset)
 - Existing SIP Accommodates FA
 - CO & PM₁₀:
 - State's Say Modeling is Not Needed
 - Area-Wide Modeling Analysis

Port's on the Front Line

- California Ports (Specifically Los Angeles, Long Beach, & Oakland) Were the First into the Fire
- Houston
- PANYNJ
- _____??

Air Quality – The Future

- New 8hr Ozone Standard (EPA review)
- Fine Particulate Standard (PM_{2.5}; EPA review)
- EPA's Category 3 Engine Regulations (Feb 02)
- Diesel as an Air Toxic (CA only; EPA reviewing)
- Greenhouse Gases
- IMO Annex VI
- Dogs and Cats Living Together