

Coffee Roasting: Environmental Impacts and Regulations

March 6, 2020

Presenters:

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Environmental Regulations Applicable to the Coffee Roasting Industry

- Environmental regulations originate from:
 - Clean Air Act (1970)
 - Clean Water Act (1972)
- Overseen by the Environmental Protection Agency (EPA)
- Usually delegated to a state or local agency
- Two areas of regulation relevant to the coffee industry:
 - **Air Pollution**
 - **Water Pollution**



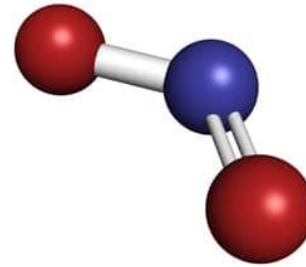
Air Regulations

- Goal is to reduce levels of specific air pollutants known to adversely impact human health or the environment, including:
 - Nitrogen Dioxide
 - Carbon Monoxide
 - Particulate Matter
 - Volatile Organic Compounds
 - Hazardous Air Pollutants
 - Ozone



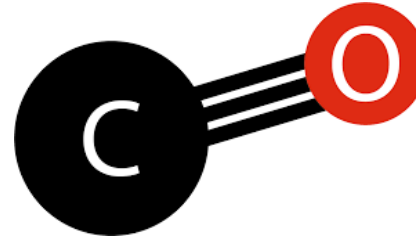
Nitrogen Dioxide (NO₂)

- Produced by combustion reactions
- Inflames lining of lungs
- Increases risks of asthma and respiratory infections
- Reacts in the atmosphere to form **Ozone**



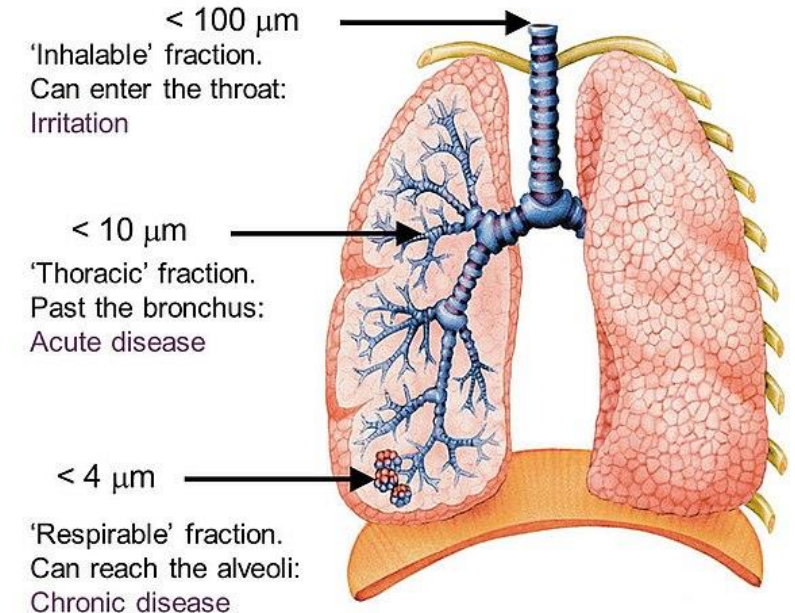
Carbon Monoxide (CO)

- Produced by combustion of carbon based materials
- Impairs ability of blood to transport oxygen
- Especially dangerous to people with impaired cardiovascular systems
- Can be fatal



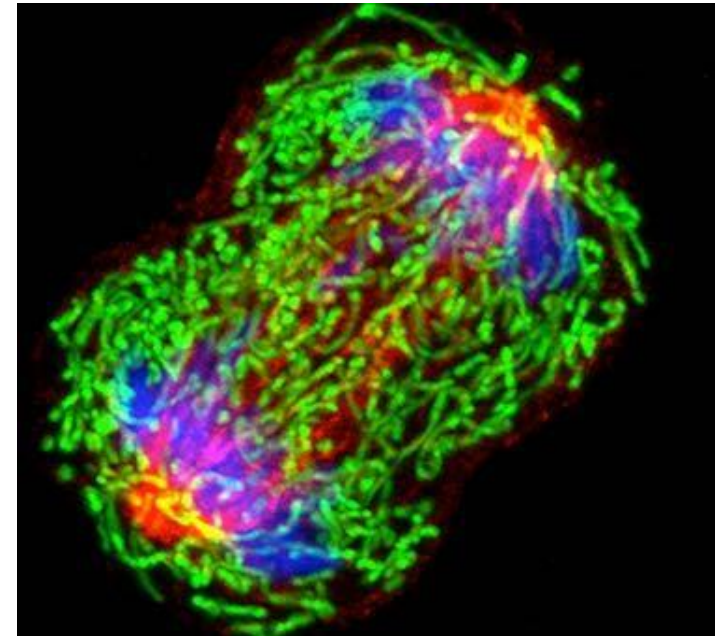
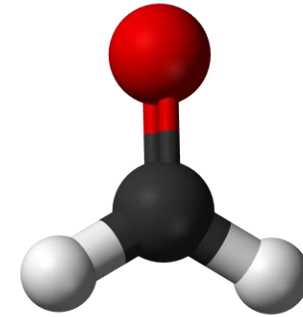
Particulate Matter (PM)

- Dust, soot, and other small particles
- From smokestacks, fires, unpaved roads, construction sites, and some chemical processes.
- Small particles can get trapped deep in lungs
- Impairs heart and lung function.



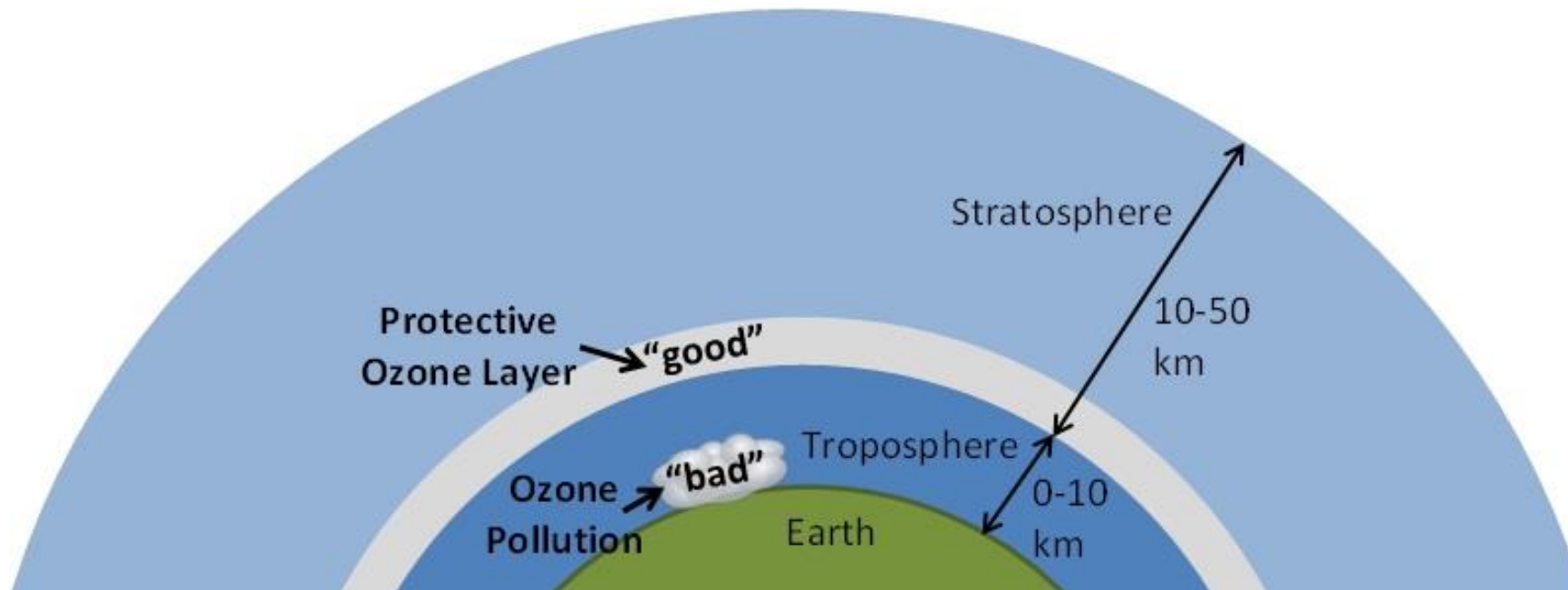
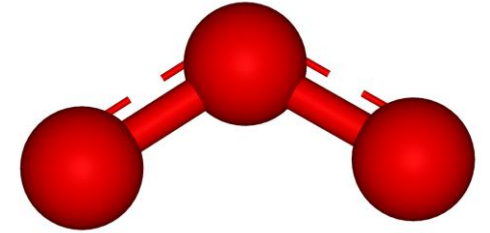
Volatile Organic Compounds (VOC) and Hazardous Air Pollutants (HAPs)

- Groups of compounds found in organic material
- Known to have health and environmental impacts
 - VOC reacts in the atmosphere to form **Ozone**
 - HAPs cause **cancer** or other serious health effects

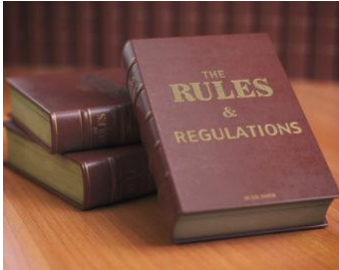


Ozone (O_3)

- NO_2 and VOC react to form O_3 in the lower atmosphere
- Irritates nose, throat, and lungs, and can cause permanent lung damage



How are Air Emissions Regulated?



Rules that impose industry-specific operational requirements or emission limits

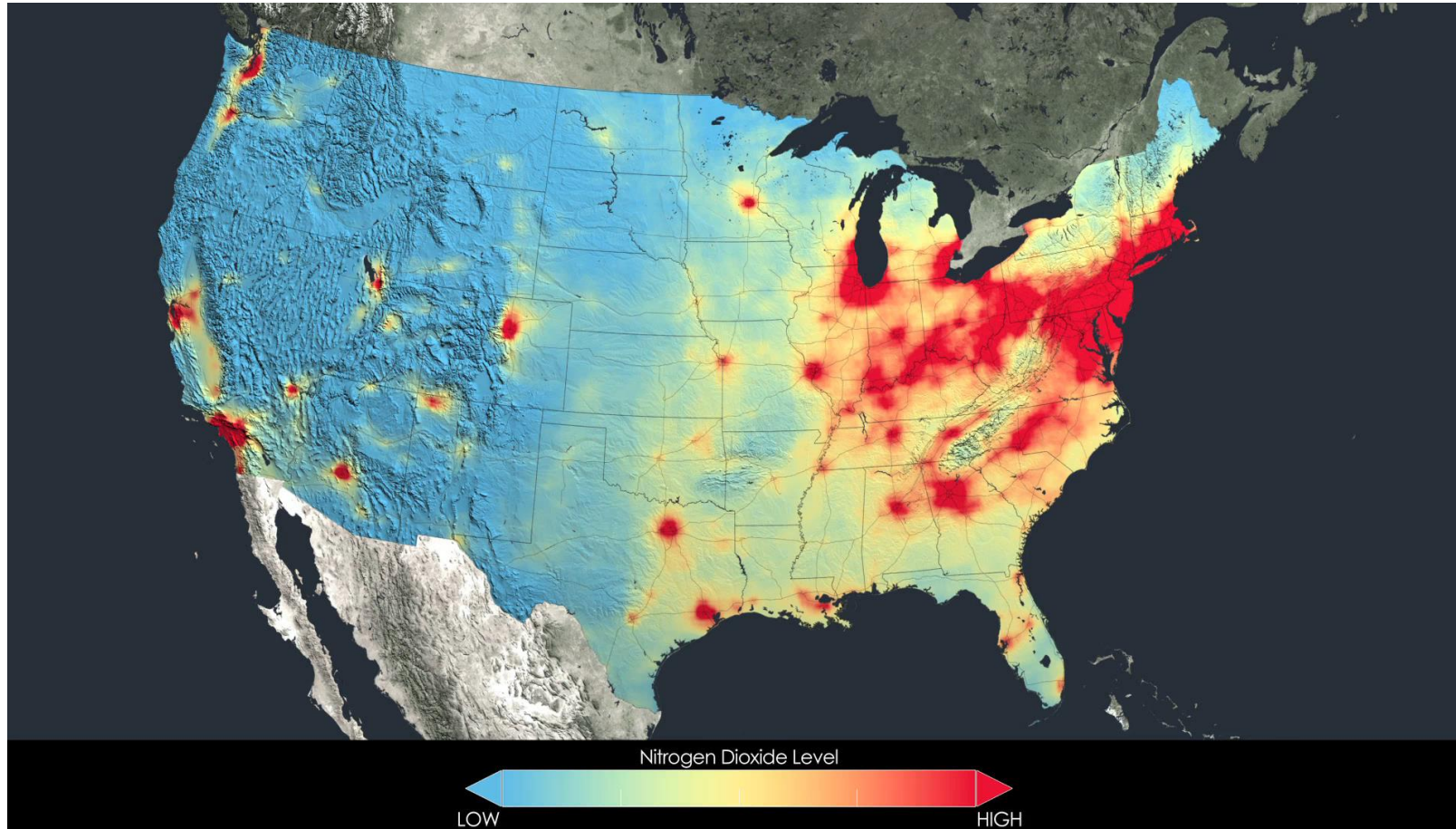


Air Permits that impose facility-specific operational requirements or emissions limits



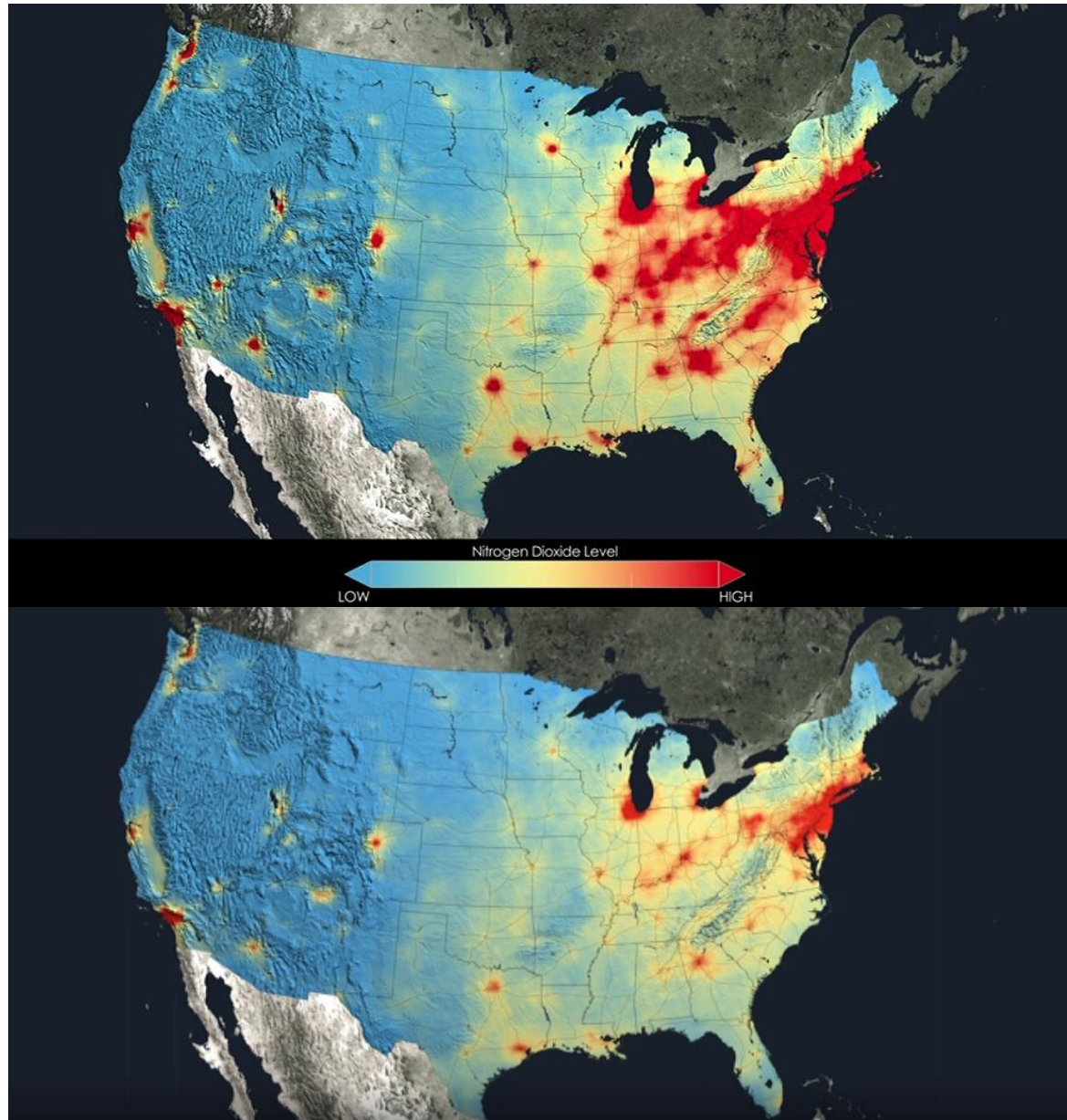
Inspections of facilities to ensure compliance with all rules and permits

NO₂ Atmospheric Concentration 2005 - 2011



NASA Goddard's Scientific Visualization Studio/T. Schindler

2005



2011

NO₂ **Atmospheric** **Concentration**

NASA Goddard's Scientific Visualization Studio/T. Schindler

How are Air Emissions from the Coffee Industry Regulated?

- **Rules**
 - Federal - None that affect coffee industry
 - State/Local – check with your agency
- **Air Permit** – required for most roasting facilities
- **Inspections** - random or due to complaint



Air Permits

- Usually issued by state/local agency
- Two main types:
 - ☐ **Construction** - if required, must obtain before constructing or installing equipment
 - ☐ **Operating** (a.k.a. **Title V**) - if required, must obtain before operating your facility
- ☐ “Minor” Sources – may need one, both, or neither type
- ☐ “Major” Sources – always need both types

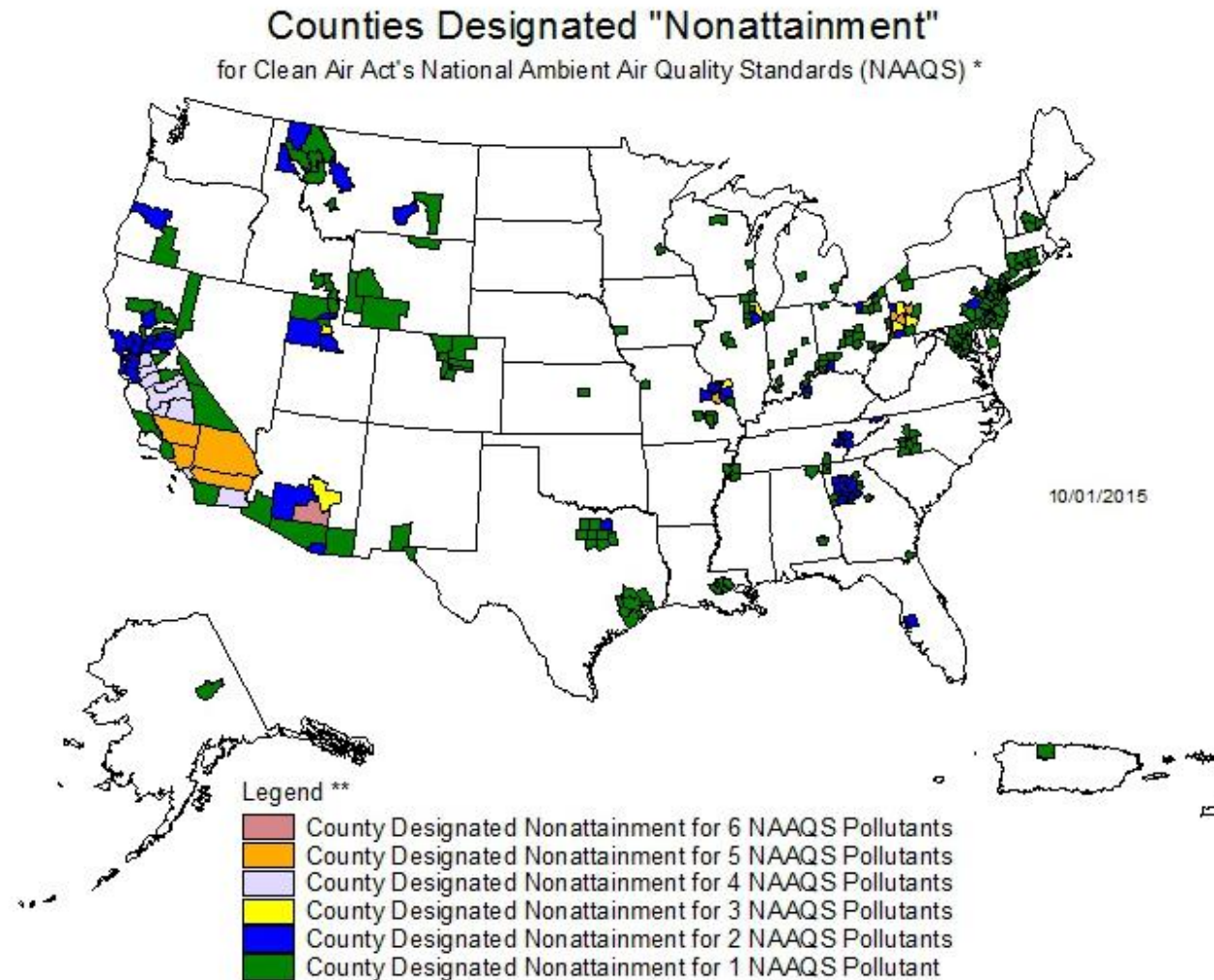


Air Permit

1. Emission Limits
2. Operational Restrictions
3. Control Requirements
4. Monitoring Requirements
5. Notification Requirements
6. Recordkeeping Requirements
7. Expiration Date

National Ambient Air Quality Standards (NAAQS)

NO ₂	1 hr: 100 ppb 1 yr: 53 ppb
CO	1 hr: 35 ppm 8 hr: 9 ppm
Ozone	8 hr: 70 ppb
PM ₁₀	24 hr: 150 µg/m ³
PM _{2.5}	24 hr: 35 µg/m ³ 1 yr: 12 µg/m ³
SO ₂	1 hr: 75 ppb
Lead	3 mo: 0.15 µg/m ³



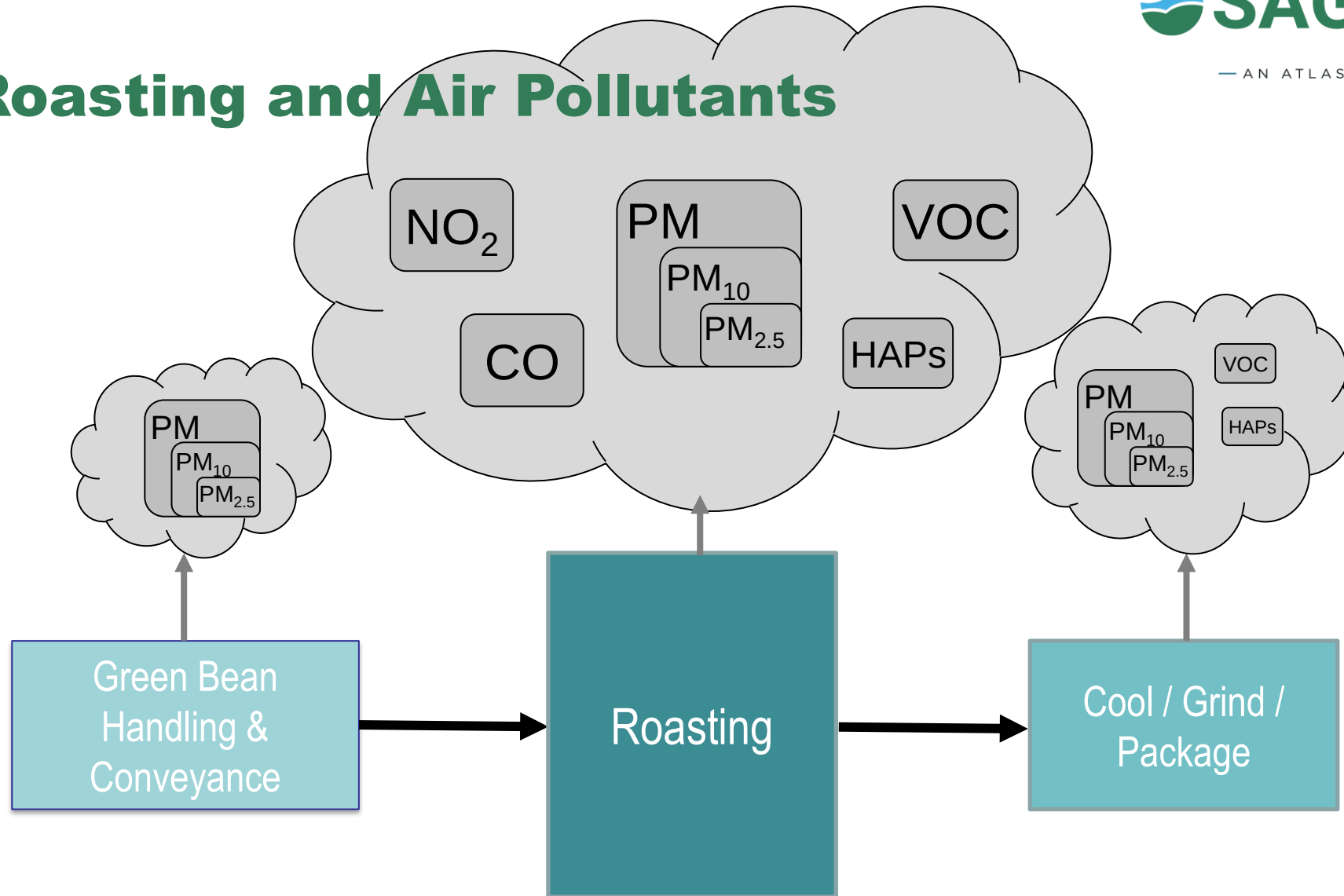
Major Source Thresholds

Attainment Areas:
≥100 tpy

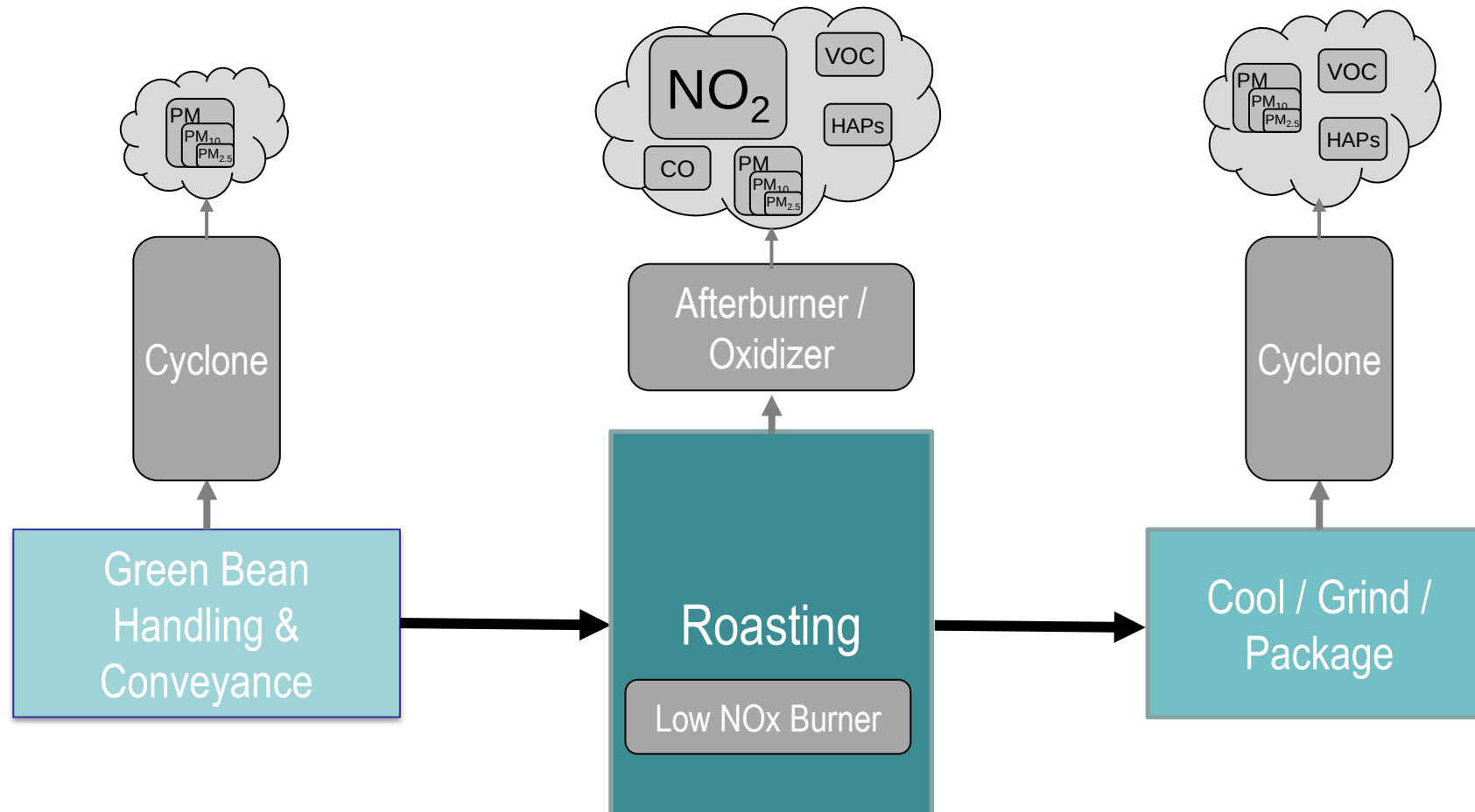
**Nonattainment
Areas:**
depends

*Ex: Houston is designated
severe nonattainment for
ozone, so major source
threshold is ≥25 tpy VOC or
NO_x*

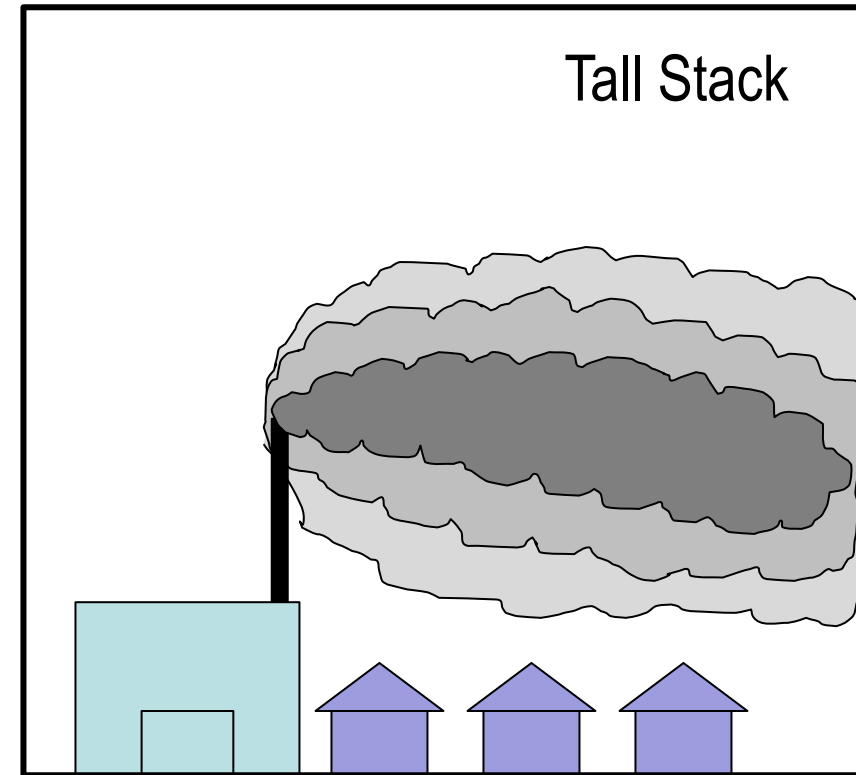
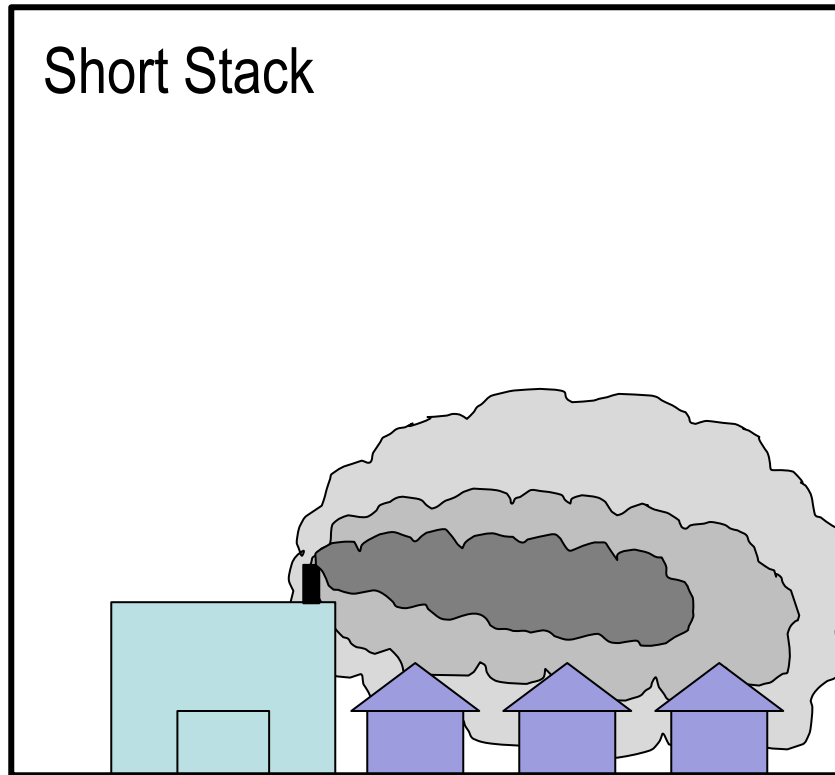
Coffee Roasting and Air Pollutants



Controlling Air Pollutants



Pollutant Air Dispersion



When is an Air Permit?

It depends on **where** you facility is located and the rules for that location.

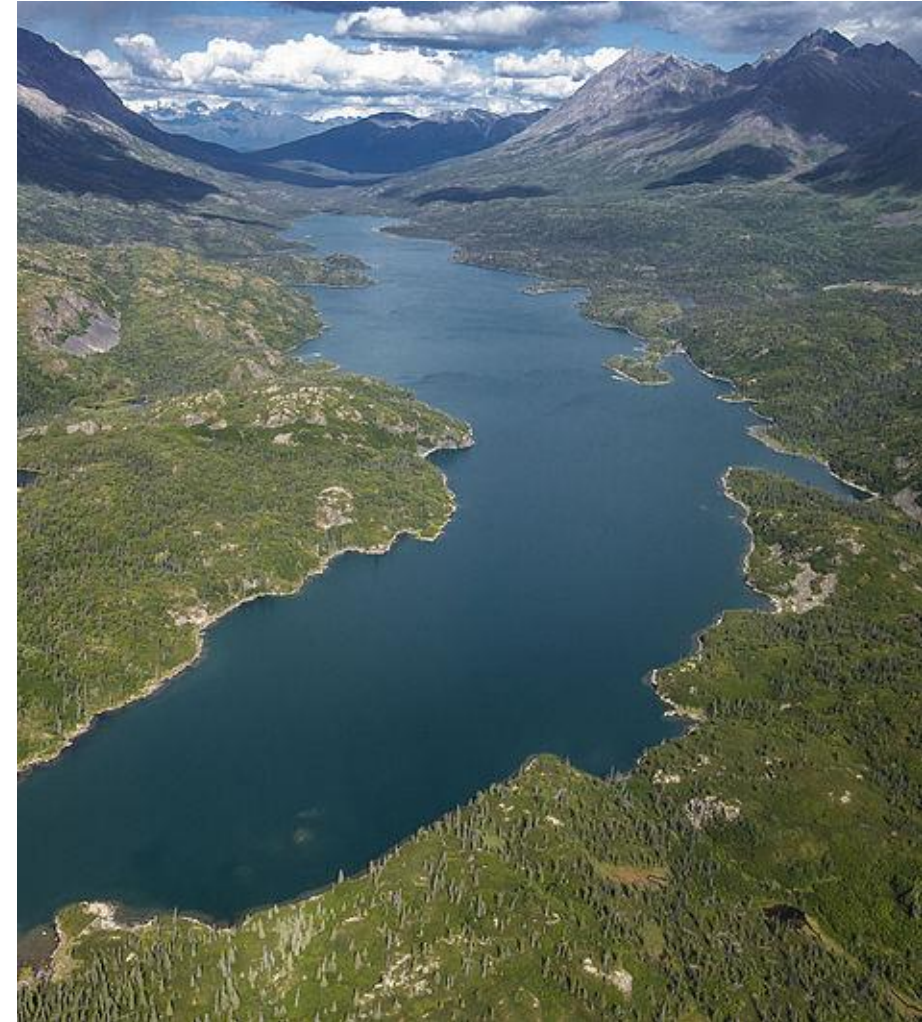
Examples

- ☐ Texas – always required
- ☐ Colorado - required if pre-control emissions exceed permit reporting thresholds (which depend on pollutant and attainment status)
- ☐ Vermont – required if roast > 1 million pounds of beans per year
- ☐ San Diego County, CA – required if roaster capacity > 11 pounds

Water Regulations

EPA regulates discharges of pollutants into the **Waters of the United States:**

- Territorial seas
- Tributaries
- Lakes, ponds, and impoundments of jurisdictional waters
- Adjacent wetlands



Water Regulations

- EPA's goal is to protect:
 - Public water supply
 - Fish and wildlife
 - Recreational and agricultural areas
- Protect from contaminants such as
 - Fertilizers
 - Pesticides
 - Sewage
 - Industrial chemicals



Water Regulations

Two main sources of water pollution:

1. Industrial wastewater discharges
2. Stormwater contamination





Lead and arsenic contamination of Animas River in Colorado

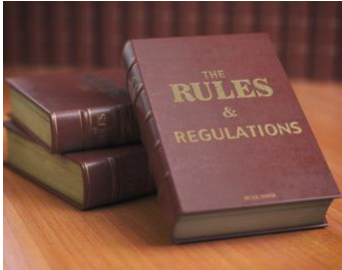
- **Direct** – contamination with toxic material
- **Indirect** – contaminants that alter ecosystem

Water Contamination



Toxic algae near Toledo, Ohio

How is Water Pollution Regulated?



Rules that impose industry-specific operational requirements or discharge limits

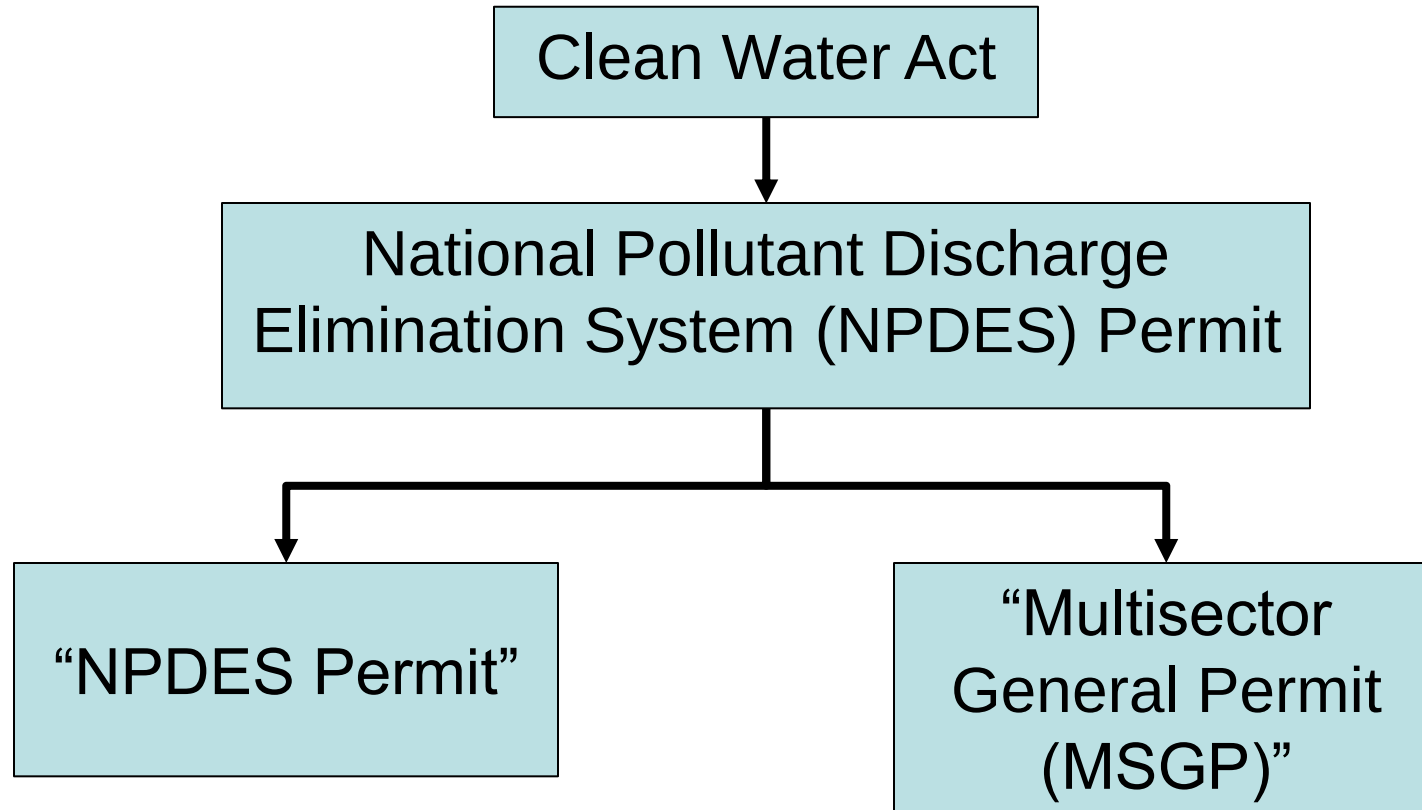


Water Permits that impose facility-specific operational requirements or discharge limits



Inspections of facilities to ensure compliance with all rules and permits

Water Permitting



Water Permitting

- **NPDES Permit**
 - Required if wastewater discharge occurring
 - Case-by-case
- **Multisector General Permit (MSGP)**
 - Allowed if no wastewater discharge
 - Different general permits for different industry types
- **No-Exposure Certification (NEC)**
 - Exemption from permitting if certify no wastewater discharge or stormwater contamination will occur.

Wastewater
Discharge

Stormwater
Contamination

Stormwater
Contamination



MSGP for Coffee Roasting Industry

- Coffee Roasting is typically SIC 2095, which is included in Sector U of the MSGP.
- Permit must be renewed every 5 years
- Must have Storm Water Pollution Prevention Plan (SWPPP)



Water Permit

1. **Discharge Limits**
2. **Control Requirements**
3. **Monitoring Requirements**
4. **Notification Requirements**
5. **Recordkeeping Requirements**
6. **Inspection Requirements**

No Exposure Certification (NEC)

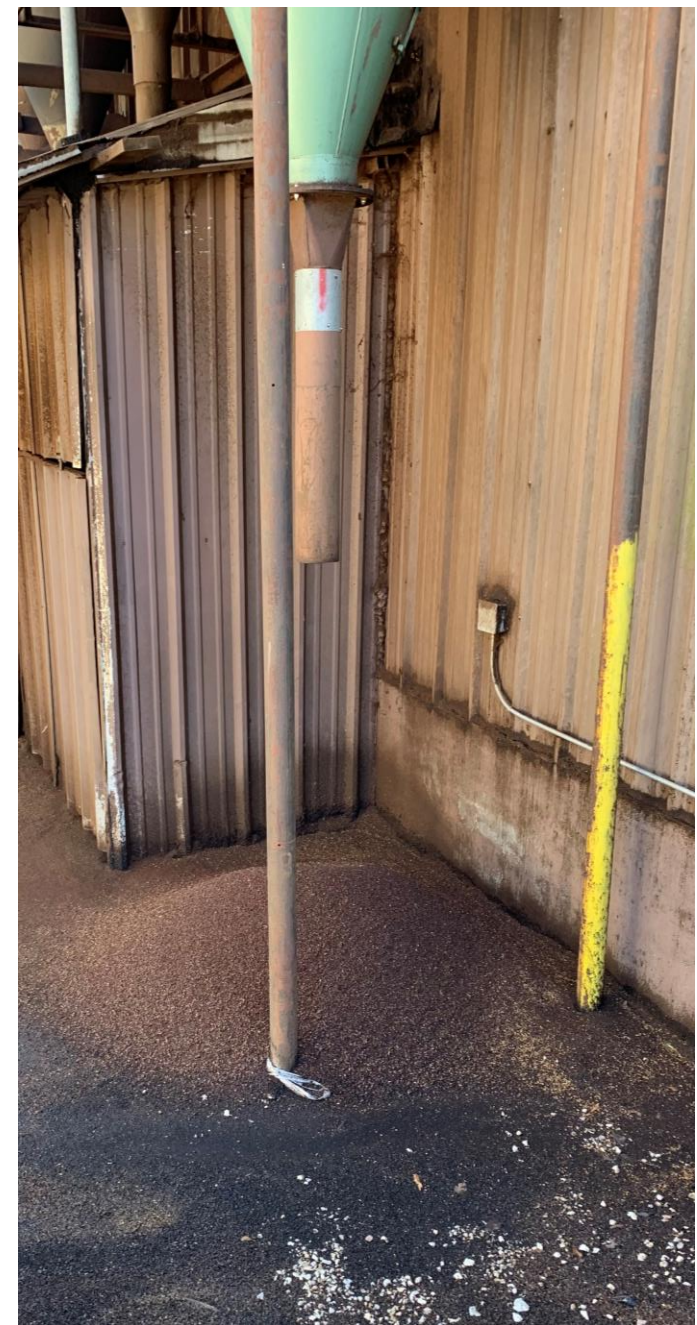
No exposure of industrial materials or activities to precipitation or runoff

- ☐ Indoors or in a Storm-Resistant Shelter
- ☐ Tightly Sealed, Leak-Free Containers
- ☐ Lidded Dumpsters, if completely covered and drain closed.



Does **NOT** Qualify for NEC

- Open container or dumpster
- Leaking container or dumpster
- Build up of chaff on roof or ground



What if I'm Not in Compliance with an Environmental Regulation?

- Violation
- Fine
- Shutdown



Erich M. Birch, JD, PE

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Environmental & Construction Law
Austin, Texas
ebirch@birchbecker.com

Consequences of Noncompliance

- Wasted time of company management and staff
- Compliance costs
 - Consultants
 - Lawyers
 - Fines & penalties
 - Corrective actions
 - Loss of business
- Public image

Jon Niermann, Chairman
Emily Lindley, Commissioner
Toby Baker, Executive Director



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

[REDACTED]
CERTIFIED MAIL 91 7199 9991 7038 7352 8441
RETURN RECEIPT REQUESTED

RECEIVED

NOV 20 2003

REGION 12

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
Re: Notice of Violation for Compliance Evaluation Investigation at:
[REDACTED], Texas
Regulated Entity No.: [REDACTED] Investigation No.: [REDACTED]

Dear [REDACTED]:

On [REDACTED] and [REDACTED], investigators from the Texas Commission on Environmental Quality (TCEQ) Houston Region Office conducted an investigation of the above-referenced regulated entity to evaluate compliance with applicable air quality requirements. Enclosed is a summary which lists the investigation findings. During the investigation, an outstanding alleged violation was identified for which compliance documentation is required. Please submit to this office by [REDACTED], a written description of corrective action taken and the required documentation demonstrating that compliance has been achieved for the outstanding alleged violation.

In the listing of the alleged violation, we have cited applicable requirements, including TCEQ rules. Please note that both the rules themselves and the agency brochure entitled *Obtaining TCEQ Rules* (GI 032) are located on our agency website at <http://www.tceq.texas.gov> for your reference. If you would like a hard copy of this brochure mailed to you, you may call and request one from either the Houston Region Office at (713) 767-3700 or the Central Office Publications Ordering Team at 512-239-0028.

The TCEQ appreciates your assistance in this matter. Please note that the Legislature has granted TCEQ enforcement powers which we may exercise to ensure compliance with environmental regulatory requirements. We anticipate that you will resolve the alleged violations as required in order to protect the State's environment. If you have additional information that we are unaware of, you have the opportunity to contest the violations documented in this notice. Should you choose to do so, you must notify me at (713) 767-3763, in the Houston Region Office, within 10 days from the date of this letter. At that time, I will schedule a violation review meeting to be conducted within 21 days from the date of this letter.

TCEQ Region 12 • 5425 Polk St., Ste. H • Houston, Texas 77023-1452 • 713-767-3500 • Fax 713-767-3520

Austin Headquarters: 512-239-1000 • tceq.texas.gov • How is our customer service? tceq.texas.gov/customer/survey

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Summary of Investigation Findings

Investigation #
Invest Date:
Additional ID(s):

OUTSTANDING ALLEGED VIOLATION(S) ASSOCIATED TO A NOTICE OF VIOLATION

Track No: Compliance Due Date:

30 TAC Chapter 101.4

5C THSC Chapter 382.085(b)

Alleged Violation:

Investigation:

Comment Date:

Failure to prevent smoke from constituting a nuisance condition.

During a complaint investigation conducted on , it was observed that smoke and particulate matter was released from and transported offsite causing a nuisance condition. This constitutes a violation of 30 Texas Administrative Code 101.4, which states, "No person shall discharge from any source whatsoever one or more air contaminants or combinations thereof, in such concentration and of such duration as are or may tend to be injurious to or to adversely affect human health or welfare, animal life, vegetation of property."

This further constitutes a violation of the Texas Health and Safety Code 382.085(b)

Recommended Corrective Action: Submit a written description of corrective action taken and the required documentation demonstrating that compliance has been achieved for this outstanding alleged violation.

Summary of Investigation Findings

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Pollution Control Services Department

101 S. Richey, Suite H
Pasadena, Texas 77506
FAX: 713-274-6475

713-920-2831

[REDACTED]
CERTIFIED MAIL: 700909600001 [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Dear [REDACTED]

Harris County Pollution Control Services Department has issued [REDACTED] Violation Notices to [REDACTED] for violation of the Texas Clean Air Act, the Texas Solid Waste Disposal Act, the Texas Water Code, and Harris County Storm Water Regulations. Specifically, violations of Title 30 Texas Administrative Code, Section 101.4 for causing a nuisance condition, and Section 116.110(a) for failure to obtain authorization to conduct coffee roasting operations were observed. As well as violations of Sections 335.2 and 335.4 pertaining to industrial solid waste, Section 281.25(a) and Harris County Industrial Storm Water Regulation, Part D, Sect. 1.02 for unpermitted storm water discharges, and Texas Water Code 26.121(a) for spilled coffee chaff were observed.

Due to the frequency and severity of these violations, your file has been forwarded to the Harris County Attorney's Office with a request for an enforcement action. If you have questions or comments, you are directed to call the Environment & Infrastructure Group Manager Rock Owens at 713 274-5121.

Sincerely,

A handwritten signature in cursive script that reads "Bob Allen".

Bob Allen
Director

cc: Commissioner R. Jack Cagle, Harris County Precinct Four
Ron Layton, Assistant Director of the Community Assistance Department, Harris County Precinct Four
Rock Owens, Managing Attorney for the Environment & Infrastructure Group, Harris County Attorney's Office
Joseph Doby, Air Section Manager, TCEQ Region 12



Pollution Control Services Department

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Joseph Doby, Air Section Manager, TCEQ Region 12

Handling a Regulatory Investigation

- Have a plan for a regulatory visit
- Be a gracious, but discerning guide
- At the end, get the bottom line from the investigator
- Take appropriate action after the investigation
(No Action Required, Notice of Violation, Notice of Enforcement)

Top Compliance Recommendations

1. Top management commitment
2. Designated environmental manager
3. Know the rules and permit requirements
4. Know your environmental consultants
5. Employee training
6. Open communication (don't punish employees for identifying compliance issues)
7. Record keeping
8. Environmental Audits

Where to Get Help

- EPA or State/Local Delegated Agency
- Industry Group
- Environmental Attorney
- Environmental Consultant



Questions?

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Erich Birch

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