OVERVIEW OF AIR QUALITY REGULATIONS AND PERMITTING

Goal of 1970 Clean Air Act Amendments

> “To protect and enhance the quality of the nation’s air resources so as to promote the public health and welfare and productive capacity of its population.”
Achieving the Goal of the Clean Air Act

• Establish benchmarks - NAAQS
  • Control emissions of air pollutants where necessary to protect and enhance air quality

• Federal programs regulating certain industries and sources (e.g., NSPS, NESHAP)
  • Control emissions of air pollutants where practically and economically feasible

• Require states to develop “State Implementation Plans” (SIPs)
  • Review of new/modified stationary sources (permitting)
Florida State Implementation Plan (SIP)

- Incorporates new federal requirements as promulgated (e.g., NSPS, NESHAP)
- Defines how Florida will attain/maintain NAAQS
  - Florida may issue emission standards for certain types of sources or industries (e.g. sulfuric acid plants, waste-to-energy facilities, soil thermal treatment facilities)
- EPA has delegated to DEP the responsibility to review impacts of new industrial growth and modifications in Florida

National Ambient Air Quality Standards (NAAQS)

- 6 criteria pollutants used as indicators of air quality
- Maximum ambient concentration levels
  - Adverse effects on human health or public welfare can occur above these levels
  - Thresholds termed the “National Ambient Air Quality Standards”
- Areas where air concentrations exceed NAAQS designated as “nonattainment”
NAAQS Criteria Pollutants

- Carbon Monoxide (CO)
- Lead (Pb)
- Nitrogen Dioxide (NO₂)
- Ozone (O₃)
  - Rarely emitted directly. Generated by precursor pollutants
- Particulate Matter (PM)
- Sulfur Dioxide (SO₂)

NAAQS Overview

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Primary/ Secondary</th>
<th>Averaging Time</th>
<th>Level</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide (CO)</td>
<td>primary</td>
<td>8 hours</td>
<td>9 ppm</td>
<td>Not to be exceeded more than once per year</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 hour</td>
<td>35 ppm</td>
<td></td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>primary and secondary</td>
<td>Rolling 3 month average</td>
<td>0.15 μg/m³</td>
<td>Not to be exceeded</td>
</tr>
<tr>
<td>Nitrogen Dioxide (NO₂)</td>
<td>primary</td>
<td>1 hour</td>
<td>100 ppb</td>
<td>98th percentile of 1-hour daily maximum concentrations, averaged over 3 years</td>
</tr>
<tr>
<td></td>
<td>primary and secondary</td>
<td>1 year</td>
<td>53 ppb</td>
<td>Annual Mean</td>
</tr>
<tr>
<td>Ozone (O₃)</td>
<td>primary and secondary</td>
<td>8 hours</td>
<td>0.070 ppm</td>
<td>Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years</td>
</tr>
</tbody>
</table>

Particle Pollution (PM)

| PM₁₀                  | primary            | 1 year         | 12.0 μg/m³ | annual mean, averaged over 3 years                                  |
|                       | secondary          | 1 year         | 15.0 μg/m³ | annual mean, averaged over 3 years                                  |
|                       | primary and secondary | 24 hours      | 35 μg/m³   | 98th percentile, averaged over 3 years                             |
| PM₂.₅                 | primary            | 1 year         | 15.0 μg/m³ | annual mean, averaged over 3 years                                  |
|                       | secondary          | 1 year         | 35 μg/m³   | annual mean, averaged over 3 years                                  |
|                       | primary and secondary | 24 hours      | 150 μg/m³  | Annual Mean                                                         |
|                       | secondary          | 24 hours       | 35 μg/m³   | Not to be exceeded more than once per year on average over 3 years  |
| Sulfur Dioxide (SO₂)  | primary            | 1 hour         | 75 ppb     | 98th percentile of 1-hour daily maximum concentrations, averaged over 3 years |
|                       | secondary          | 3 hours        | 0.5 ppm    | Not to be exceeded more than once per year                          |

https://www.epa.gov/criteria-air-pollutants/naaqs-table
Secondary Formation of Ozone

NAAQS Precursor Pollutants

- Pollutants not listed as criteria pollutants may act as precursors to criteria pollutants.
  - Volatile organic compounds (VOC) $\rightarrow$ Ozone
  - Oxides of Nitrogen (NO$_x$) $\rightarrow$ Ozone and NO$_2$
  - Sulfur Dioxide (SO$_2$) $\rightarrow$ Particulate Matter
  - Sulfuric Acid Mist (SAM/ H$_2$SO$_4$) $\rightarrow$ Acid Rain

- O$_3$ is typically not emitted directly from stationary sources. Precursor pollutants react and form O$_3$ in ambient air.
Ambient Air Monitoring in Florida

- 105 monitoring stations across Florida
New Source Review Permitting Program

- Air permitting for construction of new **major** sources or **major modifications** to existing sources
  - Prevention of Significant Deterioration (PSD)
    - Attainment
    - Best Available Control Technology (BACT)
  - Non-Attainment New Source Review (NANSR)
    - Nonattainment
    - Lowest Achievable Emission Rate (LAER)

Identifying NSR Project Triggers Questions

- Existing units
  - Will the project impact any of the following?
    - Design rating (e.g., MW, MMBtu/hr, ton/hr)
    - Availability (e.g., downtime reduction)
    - Fuel or raw material type
    - Amount of usage (i.e., capacity factor)
    - For EGUs, heat rate (i.e., efficiency)
  - Could the project be considered reconstruction? (uncommon)

- New units
New Source Performance Standards (NSPS)

- Regulations developed by EPA for specific industries or types of emission units
- Effective date is typically the proposal date
- Appear in 40 CFR 60 (mandated under CAA Section 111)
- Based on:
  "the best system of continuous emission reduction which (taking into consideration the cost of achieving such emission reductions and any non-air quality health and environments)...has been adequately demonstrated" (40 CFR 60)

New Source Performance Standards (NSPS)

- Standards typically consist of:
  - Emission limitations
  - Stack testing
  - Monitoring requirements
  - Record keeping
  - Notification requirements
  - Reporting requirements
- Applicability triggered by construction, reconstruction, or modification
NSPS Best Available Technology (BAT)

- Regulations developed by EPA for specific industries or types of emission units
- Effective date is typically the proposal date
- Appear in 40 CFR 60 (mandated under CAA Section 111)
- Based on:
  "the best system of continuous emission reduction which (taking into consideration the cost of achieving such emission reductions and any non-air quality health and environments)...has been adequately demonstrated" (40 CFR 60)

National Emission Standards for Hazardous Air Pollutants (NESHAP)

- **Hazardous air pollutants (HAPs)** pollutants known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects
- NESHAPs are standards aimed at controlling HAP emissions from stationary sources.
- Two types of NESHAP:
  - Pollutant-specific (Part 61)
  - Industry-specific (Part 63)
Part 63 NESHAP
Industry-Specific, Maximum Achievable Control Technology (MACT)

• List of industrial categories emitting substantial quantities of HAPs
• EPA published initial list July 16, 1992
  • 166 categories of major sources
  • 8 categories of area sources
• List can be revised as specified in CAA
• Regardless of its potential to emit HAPs, a facility is only subject to CAA Section 112(d) if it belongs to one of the listed source categories OR if it contains a unit that is listed as such a source category (40 CFR 63.40)

Part 63 NESHAP
Industry-Specific, Maximum Achievable Control Technology (MACT)

• For each MACT standard there are two levels of control requirements
  • MACT for new sources
  • MACT for existing sources
• For each source category there are at least two rounds of MACT
  • Round 1 – technology-based MACT - defined regardless of risk (CAA Section 112(d))
  • Round 2 - residual risk standard - second round 8 years later which sets new standards based upon risk (CAA Section 112(f))
• Review every 8 years thereafter
BACT “Floor”

• Rule 62-210.200(32), F.A.C.
  • (d) In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR Parts 60, 61, and 63.