Air Permitting
Biomass Combustion Units

Penn State

Biomass Combustion Conference

Short Course Series 2010

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Basics

Examples of Air Contaminants

- Pollutants with National Ambient Air Quality Standards (NAAQS - see 40 CFR Part 50)
- Pollutants regulated under federal NSPS and NESHAP rules (see 40 CFR parts 60, 61, and 63)
- Regulated new source review pollutants (see 40 CFR §52.21(b)(50))
- Title V regulated air pollutant as defined (40 CFR §70.2)
- Pollutants regulated under a State Implementation Plan (SIP) or under state or local rules or policy (e.g., air toxics policy)

Basics

- **Who Regulates Air in PA?**
  - Pennsylvania Department of Environmental Protection (PADEP) responsible for implementing PA air regulations and is administrator for most Federal air rules.
  - Philadelphia Air Management Services (AMS) and Allegheny County (ACHD) have autonomous programs with rules that are similar or the same as PADEP's
  - U.S. EPA - Region 3 out of Philadelphia has direct oversight for PA

Air Permitting

The Good Stuff!!!

Does My Facility Need An Air Permit?

MYTHS	FACTS
My facility is too small	Size *does not* matter
No one told me I needed a permit	Responsibility lies with the facility
My vendor says I do not need a permit	Vendors want to make a sale
I already have an air permit	You may need more than one permit

What Air Emissions Sources Require a Construction Permit?

- Simple Rule of Thumb: An air quality plan approval to install a source is required for **ANY** air emission sources unless:
  - The source type is listed in the PADEP rules or on the exemption list

  OR
  - PADEP makes a case-by-case determination that the source does not require installation approval

Is There More Than One Kind of Air Permit?

- Permit to Install/Permit to Construct
  - Required before emissions units can be installed or modified
- Permit to Operate/Operating Permit
  - Needed to operate equipment once installation or modification is completed

Pennsylvania Air Quality Permits

- Plan Approvals (Construction Permits)
- State Only Operating Permits (Minor Source /Synthetic Minor OPs)
- Title V Operating Permits (Major Source OPs)

Step 1: Define The Project

- Will the project require an exhaust stack?
- Will this project result in a production increase?
- Will this project remove any existing production constraints? (Debottleneck)
- Does this project require a physical change to an existing process?

Step 1: Define The Project

- Does this project result in the use of new and/or greater quantities of raw materials?
- For Biomass – it is likely any existing permit does not provide for biomass as a permitted fuel for the combustion unit!
- Will this project involve changes to existing pollutant control systems?
- Will this project increase my production capacity ?

Major Source Emission Increase

Pollutants	Precursors	Attainment Classification	Major Source Threshold (tons per year)	Significant Emission Increase (tons per year)
NOx, SO_2, Lead	NA	PSD General	100/250	As applicable
Ozone	VOC/NOX	NNSR outside of Philadelphia 5-County Area	50/100	40
Ozone	VOC/NOX	NNSR Severe-Philadelphia	25	25
$PM_{2.5}$	NA	PSD/NNSR	100	10
$PM_{2.5}$	NO_X	PSD/NNSR	100	40
$PM_{2.5}$	SO_X	PSD/NNSR	100	40
PM_{10}	NA	PSD/NNSR	100	15

Step 2: Check The Air Regulations

- **Federal New Source Performance Standards (NSPS)**
- **National Emission Standards for Hazardous Air Pollutants (NESHAP)**
- **Maximum Achievable Control Technology (MACT) Standards**

Step 2: Check The Air Regulations

- **Maximum Achievable Control Technology (MACT) Standards**
  - 40 CFR Part 63
  - EPA did propose a Boiler MACT
  - Anticipated to be effective December 2010
  - Major and area sources of HAP
  - Emission limits, testing, monitoring, recordkeeping and reporting requirements
  - Lots of possible litigation – and delays

Step 2: Check The Air Regulations

- Pennsylvania requires that all new or modified sources are subject to review for:
  - Best Available Technology (BAT)
- And Major Air Emission Sources can be subject to review for:
  - Best Available Control Technology (BACT)
  - Lowest Achievable Emission Reductions (LAER)

Step 2: BAT / BACT

- A PSD BACT review will require performance of a "Top-Down" analysis
  - Determine what control technologies are feasible vs. technically infeasible
  - Rank "feasible" controls according to their effectiveness
  - Evaluate operating costs on $/ton basis

Step 2: LAER

- The rate of emissions based on the following, whichever is more stringent:

(A) The most stringent emission limitation which is contained in the implementation plan of a state for the class or category of source unless the owner or operator of the proposed source demonstrates that the limitations are not achievable.

(B) The most stringent emission limitation which is achieved in practice by the class or category of source.

Step 3: Determine Emission Increase

- **New Sources:**
  - Potential To Emit –
    - Max Capacity at 8760 hrs/yr unless otherwise restricted
- **Existing Major Facilities or Where the Emission Increase Will Be Major Itself**
  - Modified Sources – Projected Actual Emissions minus Baseline Actual Emissions

Step 3: Existing Modified Sources

- Calculate Baseline Actual Emissions (BAE)
- Determine a Future Projected Actual Emissions (PAE)
- Recent EPA decisions do not allow maximum credit for substitution of cleaner fuels. THIS IS BAD NEWS FOR BIOMASS FUEL SUBSTITUTIONS ! ! ! !

Step 4: Dispersion Modeling

- Required for PSD Major Source Permits
- New NAAQS for NO_X is very low and problematic to demonstrate compliance
- Screen modeling - simple, conservative, overestimates ambient concentrations
- Refined modeling – more complex, very expensive & causes significant project time delays