Air Quality: What's Coming in 2011 and What Should You Do?

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Outline

- Typical Air Emissions
- Clean Air Act
- EPA Consent Decree
- State Regulations
- 2011 Requirements
- Best/Beneficial Management Practices

Typical CAFO Emissions

Typical CAFO Emissions

- Typical contributing air emission sources include:
  - Production Buildings
  - Housing Buildings
  - Feedlots
  - Waste Lagoons
  - Storage Piles
  - Combustion of fossil fuels(heating, generators...)
  - Waste-to-Energy

Typical CAFO Emissions

- CAFO primary pollutants of concern
  - VOCs
  - Particulate (TSP, PM10, PM2.5)
  - Hydrogen Sulfide
  - Ammonia
  - Odor
- CAFO secondary pollutants of concern
  - Methane
  - Nitrous oxide
  - Sulfur compounds
  - Green House Gases

Clean Air Act

Clean Air Act (CAA)

- Federal Law with the purpose of protecting and improving air quality
- Regulates major air sources
  - 100 tons/yr of CO, NOx, SOx,VOCs or PM
  - 25 tons/yr total HAPs
  - 10 tons/yr single HAP

Clean Air Act (CAA)

- CAA requires that each major source
  - Obtain a Title V air permit
  - Perform air dispersion modeling
  - Meet ambient air criteria (NAAQ)
  - Provide emissions reports and certify compliance
  - Pay fees (typically based on quantity of emissions)

EPA Consent Decree

EPA Consent Decree - Goals

- Ensure AFO compliance with applicable regulations (Clean Air Act, CERCLA, EPCRA)
- Monitor and evaluate AFO emissions
- Develop standardized methods to estimate AFO emissions
- Improve Air Quality

Consent Decree can be found at:

http://www.epa.gov/compliance/resources/agreements/caa/cafo-agr-050121.pdf

EPA Consent Decree - Status

- Sign-up period ended August 2005
- First ratified Air Compliance Agreements in January 2006
- EPA received approximately 2,700 Agreements that represented over 13,000 farms in the US : swine (42%), dairy (4%), egg-laying (19%), broiler (35%)

What if you signed the Consent Decree?

- Pay up to $2,500 into emissions fund
- Must make your farm available for monitoring
- Must apply for all applicable permits
- Must install BACT or LAER control technology on all major sources

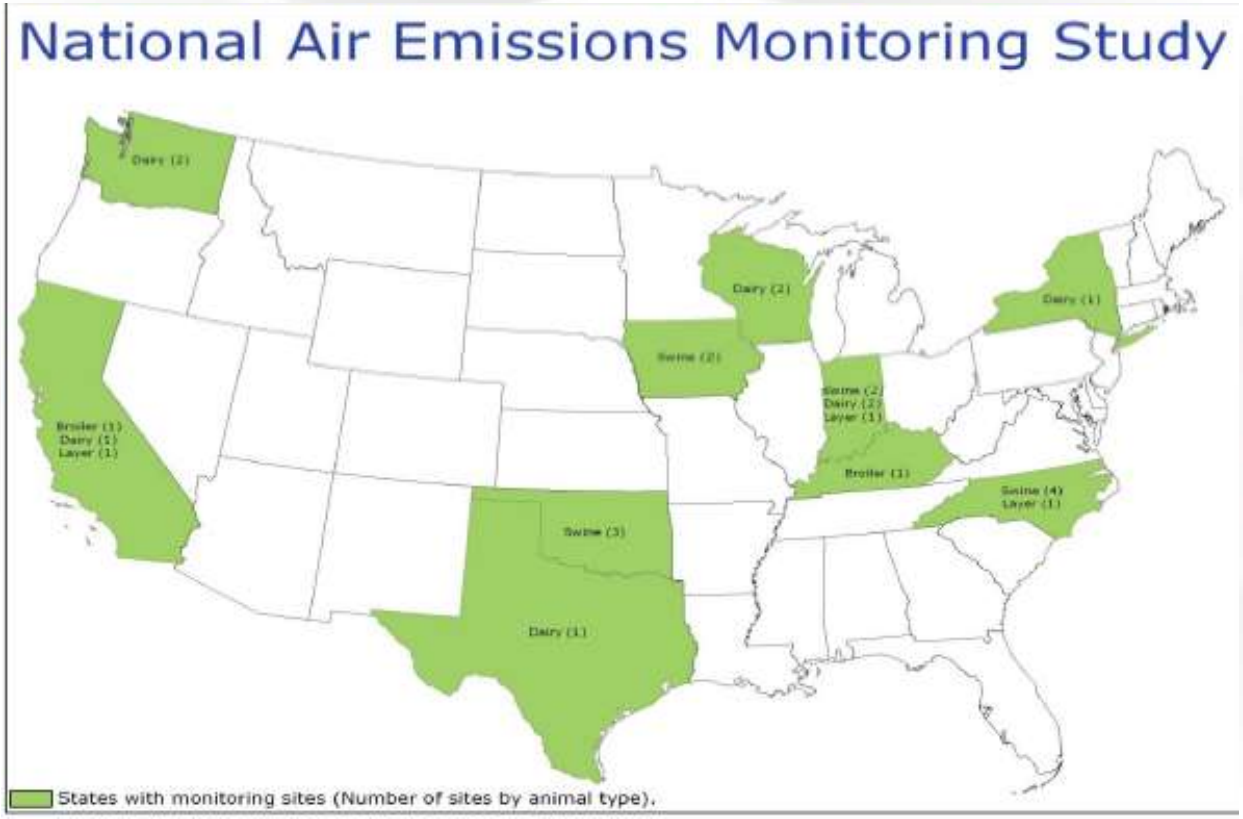
What if you signed the Consent Decree?

- EPA will not sue for past violations applicable to Clean Air Act, CERCLA, or EPCRA
- Decree does not cover past violations from generators, waste-to-energy, and land application of animal waste

Monitoring Program

- The National Air Emissions Monitoring Study (NAEMS) was undertaken to address the lack of data available to estimate emissions from agricultural sources.
- Data collection commenced Summer 2007
- Data collection ended in 2010 (behind schedule)
- Data published on January 13, 2011 (not refined)
- Different types of operations and animal groups were studied
- 25 sites were monitored in 10 states

Monitoring Program



Monitoring Program – Data Collected

- The Monitoring Program collected a variety of data in order to develop Emission Estimating Methodologies including:
- Animal inventory, animal mass, and production information(eggs/milk).
- Average concentrations and emissions of NH_3, H_2S, PM (TSP,PM_{10}, $PM_{2.5}$), and VOC.
- Confinement temperature, relative humidity, static pressure, and ventilation flow rate.
- Ambient temperature, relative humidity, pressure, wind speed, wind direction, and solar radiation.

Data can be located at :
http://www.epa.gov/airquality/agmonitoring/index.html

Emission Estimating Methodologies

- Emission Estimating Methodologies will be developed to estimate daily and annual emissions for the following compounds:
  - Ammonia (NH_3)
  - Hydrogen Sulfide (H_2S)
  - Volatile Organic Compounds (VOCs)
  - Particulate Matter (TSP, PM10, PM2.5)
- The EPA anticipates that these Emission Estimating Methodologies will take the form of multi-parameter emissions factors (similar in form to those used to estimate PM emissions from unpaved roads).
- EPA may develop tiered methodologies that will provide gross and more detailed emission estimates (depending on the availability of input data at the farm level).

NAEMS Path Forward

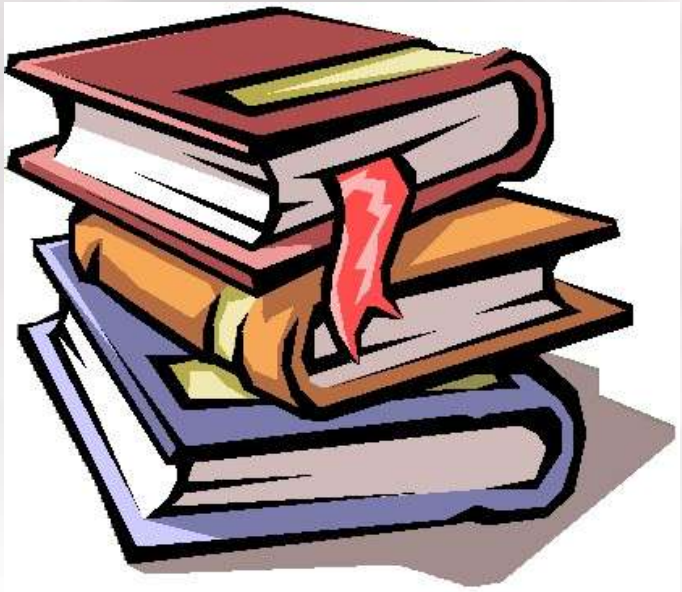
In the next few months, the EPA has stated that the NAEMS will continue as follows:

- Make data available to the public – (available Jan 2011)
- Solicit additional data/studies
- Publish Emission Estimating Methodologies (EEM) – 18 months after receiving final reports.
- Plan to publish EEM on a rolling basis: Broilers, egg layers, swine & dairy
- Public review process will be consistent with the Agency's approach for developing emission factors.

Further Information

- Participants must comply with any applicable requirements –120 days after publication of Emission Estimating Methodologies (timing unknown)
- EPA has finalized a rule (40 CFR part 98, subpart JJ) which contains reporting requirements for GHGs (for animal agricultural sources emitting over 25,000 metric tons annually of CO_2 equivalent
- Consent Decree does not impact actions to abate odors
- Odors are State and Locally governed
- Consent Decree does not provide protection against State or Local Government permitting requirements

State Regulations



NR 445

- Regulated by Wisconsin Department of Natural Resources
- Regulation for Hazardous Air Pollutants (HAPs) including ammonia and H_2S
- Specifies emission thresholds and ambient air criteria

NR 445

- Compliance with NR 445 is not required until July 31, 2011 for sources associated with agricultural waste.

NR 445

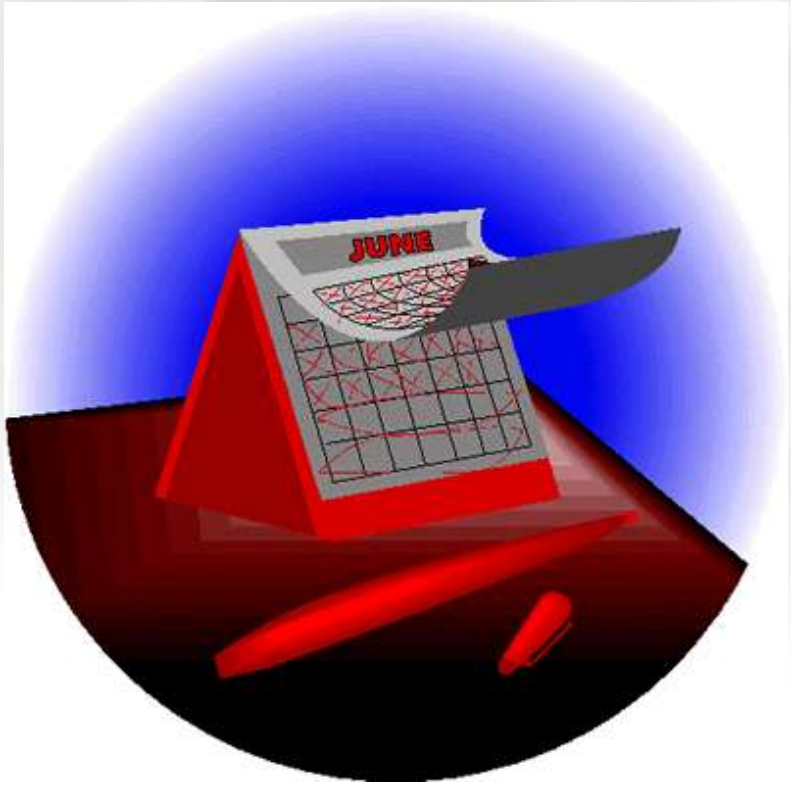
- NR 445(3)(c) States that air emissions associated with Ag. Waste will be deemed in compliance provided beneficial management practices (BMPs) are followed
- If BMPs are not implemented, must prove compliance with ambient air criteria
- BMPs are being developed by Wisconsin Department of Agriculture, Trade and Consumer Protection, the first set of **draft** BMPs were published with a comment period ending January 31, 2011.

The draft BMP documentation can be located at:
http://dnr.wi.gov/air/agWasteBMPs.html

NR406/407

- NR406 = Construction Permits
- NR407 = Operating Permits
- Required for major and minor sources
- Exemptions apply based on contaminant loading for minor sources

2011 Requirements



2011 Requirements - Federal

- Once emission estimating methodologies have been published by USEPA, compliance with applicable regulations (Clean Air Act, CERCLA, EPCRA) will need to be determined
- It is anticipated that the emission estimating methodologies may include an emission factor method which would estimate the emissions from an operation based on the number of animals at the facility ex.

  # animal units x emission factor = X tons/yr

2011 Requirements - Federal

- Must apply for all applicable permits
- Must install BACT or LAER control technology on all major sources
- This date may be pushed back as there have been delays with the study

2011 Requirements - State

- Date pushed to July 31, 2011
- Must achieve compliance through the use of emission factors or the implementation of BMPs
- Must provide compliance demonstration and notification
- BMPs must be State approved

Best/Beneficial Management Practices

BMPs

- Finalized BMPs are not yet available on a Federal or State Level
- BMPs can be abatement applications or farm management
- The State has published a **draft** document outlining proposed BMPs for mitigating hazardous emissions from animal wastes – this document had a public comment period from December 13, 2010 to January 31, 2011 – the results of the consultation were not known at the time of publishing of this presentation

BMPs

- The State documentation acknowledges that not every BMP is applicable to every farm, but that each operation may have a different BMP depending on its operational characteristics

Beneficial Management Practices

Animal Nutrition and Feed Management

- Animal Nutrition and Feed Management
- Silage Storage

Land Application

- Injection
- Incorporation
- Banding
- Other Techniques

Beneficial Management Practices

Animal Housing

- Biofilter
- Composting Manure with Proper C:N Ratio
- Vegetative Environmental Buffers (VEB)
- Mechanical Scraping
- Wet Scrubber/Bio Scrubber
- Urine Feces Segregation
- Chemical or Biochemical Manure Additives Chemical Additives
- Chimney Exhaust/Air Impaction Methods

Beneficial Management Practices

Open Lots & Corrals

- Vegetative Environmental Buffers (VEB)
- Open Lot Frequent Cleaning (concrete and earthen surface)
- Feedlane - Durable Surfaces
- Chemical or Biochemical Manure Additives

Pasture

- Rotational Grazing as Production Method

Beneficial Management Practices

Manure & Treatment

- Impermeable Cover
- Permeable Geotextile and Bio-covers, including Natural Crust
- Biofilter
- Composting Manure with Proper C:N Ratio
- Vegetative Environmental Buffers (VEB)

Beneficial Management Practices

Manure & Treatment (continued)

- Bottom Filling, Minimizing Surface Agitation Anaerobic Digester
- Wet Scrubber/Bio Scrubber
- Wastewater Treatment
- Chemical or Biochemical Additives
- Manure Solids Separation

BMPs

- Dust Control/Suppression
- Neutralizing Agents
- Manure Handling
- Application Technique
- Ventilation/Windbreaks
- Biofilters
- Digestion
- Scrubbers

Dust Control/Suppression

- Vegetable Oil Sprinkling Systems
- Covers – Permeable or Impermeable
- Dust Collectors on Exhausts
- Watering Program

Neutralizing Agents

- Odor fence in doorways/fence line
- Lagoon sprays

Manure Handling

- Locate new manure storage as far as possible from residences
- Remove manure from buildings frequently
  - At least once per week
- Cover storage piles where possible
  - Lime, sawdust, impermeable cover
- Manure Additives
- Downwind from homes/high use areas

Application Technique

- Incorporate manure as soon as possible after applications to row crops
- Spread on cool days
- Use injection when possible
- Coordinate with neighbors before spreading

Ventilation/Windbreaks

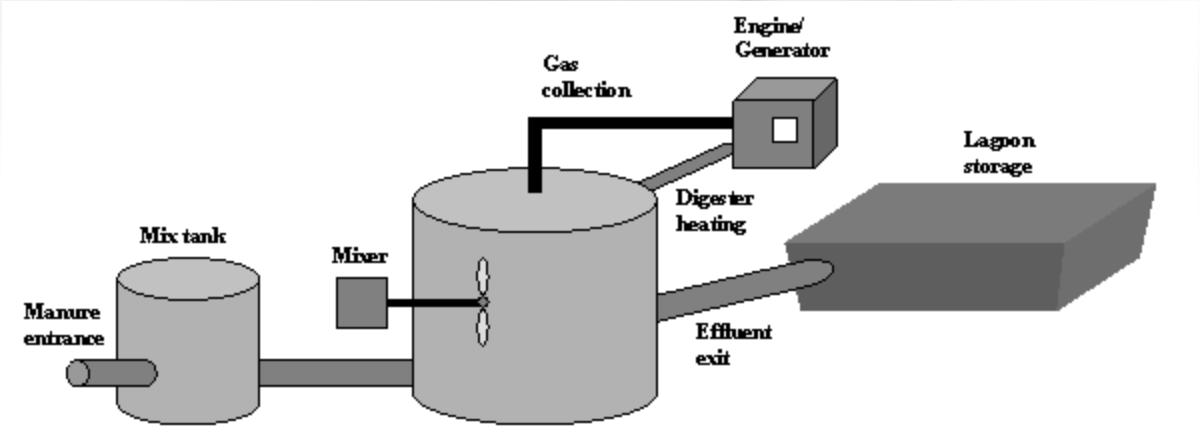
- Ventilate buildings with fresh air to prevent anaerobic decomposition and reduce odors
- Locate ventilation away from residences
- Create windbreaks when ventilation faces residences through Vegetated Environmental Buffers (VEB)

Biofilter

- Microorganisms (bugs) breakdown odor causing contaminants
- Many different types of filter media (corncobs, wood chips, peat, etc)
- Air is passed slowly through the media

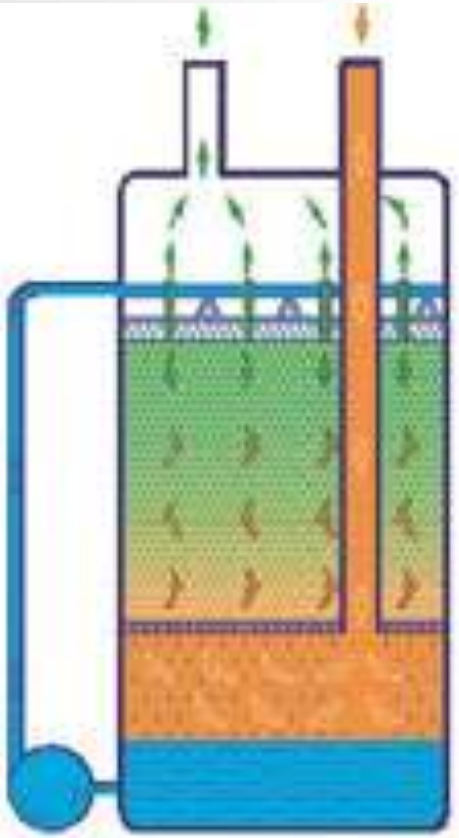
Digesters

- Anaerobic treatment of manure to reduce odor before application
- Can be used to generate methane for energy
- Reduces pathogens to protect water quality

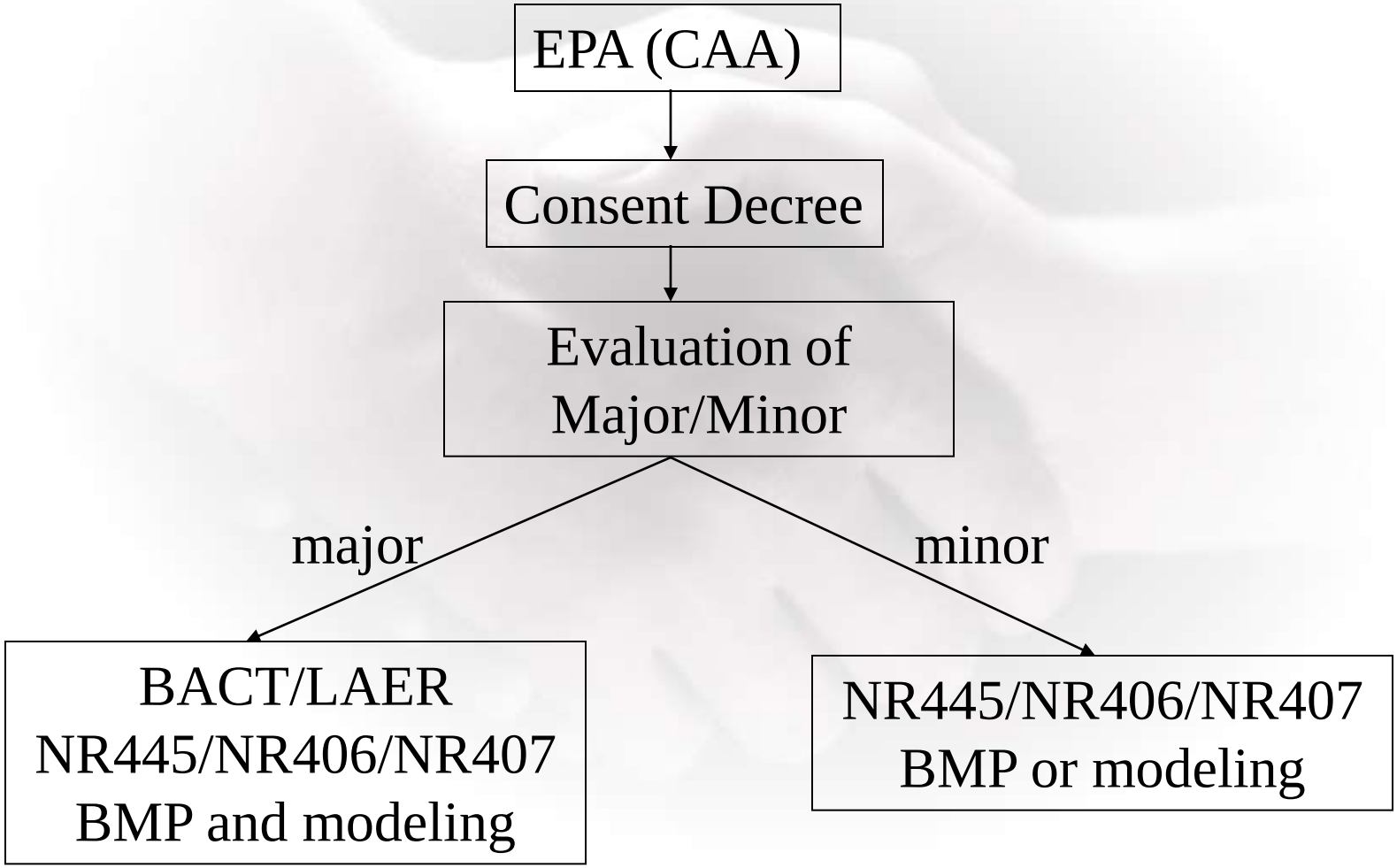


Wet Scrubber

- Applied to air streams/exhausts
- Can remove particulate, ammonia, and hydrogen sulfide



Summary


EPA (CAA)
Consent Decree
Evaluation of Major/Minor
major
minor
BACT/LAER
NR445/NR406/NR407
BMP and modeling
NR445/NR406/NR407
BMP or modeling

Summary

- EPA CAA – agriculture not exempt but lacking tools to evaluate emissions
- Consent Decree – study for emission factors
- Facilities use emission factors to determine major/minor significance
- Major – must get Title V permit (incorporatesBACT/LAER) in addition to State construction/operating permits (incorporates BMP)
- Minor – State construction/operating permits (incorporates BMP)

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