

# Air Quality Permitting Webinar



Sponsored by

Kansas Small Business  
Environmental Assistance Program

and

Kansas Department of Health and Environment,  
Bureau of Air



Webinar will begin at 10:00 a.m. CDT  
March 24, 2010

# Webinar Logistics

- You will not be able to speak during the Webinar.
- Trouble hearing? Use your phone. Click on the phone icon and dial the number/pin number. Mute your line (please!).
- Ask questions by typing them into the long text box at the bottom of the screen and pressing “Enter.”  
Questions will be answered at end, time permitting.
- Slides will advance automatically.
- Questions? Call the help desk at 785-532-7722.
- The presentation and questions will be archived. Access instructions and survey will be sent via e-mail.

# Agenda

- SBEAP
- Air regulation overview
- Potential to emit (PTE)
  - What is it?
  - How is it calculated?
  - Examples
- Emission sources
- Construction permits/approvals
- Operating permits (Class I and II)
- NESHAP/MACT

# Small Business Environmental Assistance Program



- Provides air-focused technical assistance to Kansas small- and medium-sized businesses
  - Environmental regulatory compliance
  - Emissions reduction and pollution prevention
  - Permitting and reporting requirements
- All states have a similar program.

# Small Business Environmental Assistance Program

- SBEAP services are provided via
  - Environmental hotline (800-578-8898)
  - On-site visits
  - Targeted regulatory or industry-specific workshops
  - Publications (hard copy or electronic)
    - Fact sheets, manuals
    - E-tips
  - Web-based resources and training
    - [www.sbeap.org](http://www.sbeap.org)



# CAA 1970

- Risk-based standards
  - $\text{SO}_x$
  - $\text{NO}_x$
  - CO
  - $\text{PM}_{10}$
  - Lead
  - Ozone
- Technology-based standards for point sources

# CAAA 1990

- Contains 11 titles, including –

Title I: National ambient air quality standards (NAAQS)

Title III: Hazardous air pollutants (HAPs)

Title V: Operating permits

# Kansas Air Quality Regulations

## KAR 28-19-1 -- 801

- The Kansas Air Quality Act (KAQA) implements elements of the 1990 Clean Air Act Amendments.
- It is administered by the Kansas Department of Health and Environment (KDHE) Bureau of Air.
- Located on the KDHE BOA Web site at [http://www.kdheks.gov/bar/download/KS\\_AQ\\_REGS.pdf](http://www.kdheks.gov/bar/download/KS_AQ_REGS.pdf)



# What must you evaluate?

- KQA applicability and compliance
- Existing sources that are not permitted
- Proposed sources
- Existing sources that are permitted, when modifying or adding new equipment

Emission unit – any part or activity of a stationary source that emits or would have the potential to emit any regulated pollutant or any pollutant listed under 42 U.S.C. 7412(b) of the federal Clean Air Act.

# What are emissions?

- Stack emissions
- Fugitive emissions (if a federally designated fugitive emission source)

# Identify each emissions unit

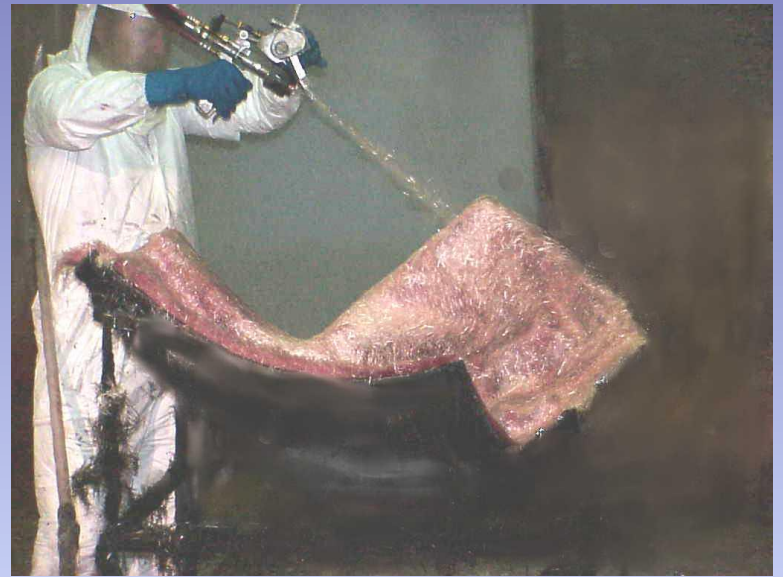
- A unit (or source) is an activity that emits or has the potential to emit.
- Emission units do not have to be connected to a stack or vent.
- The entire facility can be viewed as an emissions unit.

# Frequently overlooked emission sources

- Bleed valves
- Compressors
- Degassing (line, pump, vessel)
- Steam traps
- Process vents
- Pressure-relief
- Cooling towers
- Loading operations
- Solid wastes
- Wastewater collection and treatment
- Transfer operations

# Emissions from activities

- Conveyors
- Tank truck loading and unloading
- Valves and vents
- Wastewater treatment plant emissions
- Material storage and transfer
  - Evaporation
  - Wind erosion
- Haul roads



AEROSPACE GALLERY



# Other emissions to consider

- Degreasing tanks
- Welding activities
- Pumps
- Painting
- Cleanup



# What to leave out

## Categories of Exempt Activities

- Fuel use
- Upkeep and maintenance
- Production operations
- Finishing operations
- Storage tanks
- Wastewater collection and treatment
- Cleaning operations
- Residential activities
- Recreational activities
- Health-care activities
- Miscellaneous

Exemptions found in Class I permit application instructions –  
[www.kdheks.gov/air-permit/download.html](http://www.kdheks.gov/air-permit/download.html)

# Potential to Emit (PTE)

This is the maximum design capacity of a stationary source to emit a pollutant under its physical and operational design.

Any physical or operational limitation shall be treated as part of the design –

- Control equipment
- Hours of operation
- Amount of material
  - Stored
  - Combusted
  - Processed

# PTE assumptions

- 24-hour operation, 365 days per year
- Operate at maximum capacity
- No pollution control devices or practices
- “Bottlenecks” can limit the PTE

# Steps for calculating PTE

- Identify each emission unit
- List all possible pollutants
- Quantify emissions (tons/year)
  - Material balance
  - Emission factors
  - Performance tests

# List all possible pollutants

- Nitrogen oxides ( $\text{NO}_x$ )
- Sulfur oxides ( $\text{SO}_x$ )
- Carbon monoxide (CO)
- Volatile organic compounds (VOCs)
- Particulate matter 10 microns or less ( $\text{PM}_{10}$ )
- Lead
- Hazardous air pollutants (HAPs)

# PTE calculation methods

- CEMS
- Stack tests
- Material balance
- Emission factors
- Engineering judgment
- Other approved method

# Material balance

Product in = product out  
(assumes constant inventory)

Example: solvent cleaning  
Solvent purchased = emissions

Material balance can be applied to individual unit,  
activity, or entire source process.

# Fuel consumption

Emissions from combustion can be calculated based on the fuel and equipment used.

- Rated heat capacity can be used.
- Maximum rated fuel consumption can be used.



# Sample PTE Calculation

A facility operates a paint booth 2,000 hours a year and uses 3,000 gallons of blue paint with a density of 9.85 pounds per gallon. The paint is 25% volatile organic compound (VOC) by weight.

## Actual emissions

$$\begin{aligned} & (3,000 \text{ gal/yr}) \times (9.85 \text{ lbs/gal}) \times (0.25 \text{ lbs VOC/lb of paint}) \\ &= (7,388 \text{ lbs of VOC/year}) \times (1 \text{ ton}/2,000 \text{ lbs}) \\ &= 3.7 \text{ tons of VOC/year} \end{aligned}$$

## Potential emissions

$$\begin{aligned} & (3.7 \text{ tons of VOC}) \times (8,760 \text{ potential hours}/2,000 \text{ actual hours}) \\ &= 16.2 \text{ potential tons VOC/year} \end{aligned}$$

# Sample PTE Calculation (cont.)

The blue paint also has xylene (a HAP) at 14% by weight, so you follow the same calculation for each HAP.

## Actual emissions

$$\begin{aligned} & (3,000 \text{ gal/yr}) \times (9.85 \text{ lbs/gal}) \times (0.14 \text{ lbs xylene/lb of paint}) \\ & = (4,137 \text{ lbs of xylene/year}) \times (1 \text{ ton}/2,000 \text{ lbs}) \\ & = 2.1 \text{ tons of xylene/year} \end{aligned}$$

## Potential emissions

$$\begin{aligned} & (2.1 \text{ tons of xylene}) \times (8,760 \text{ potential hours}/2,000 \text{ actual hours}) \\ & = 9.2 \text{ potential tons xylene/year} \end{aligned}$$

# Tools for Air Emission Calculations

- Painting and coating
- Boilers
- Engines
- 12-month rolling totals
- MACT WWWW Compliance Demo

[SBEAP training tools](#)

# Air construction permits

- Prevention of Significant Deterioration (PSD) permits
  - Significance levels
    - 100 ton/yr PTE for listed sources
    - 250 ton/yr PTE for all other sources
- Construction permits KAR 28-19-300(a)
- Construction approvals KAR 28-19-300(b)

[\*KDHE informational sheets\*](#)

# Construction permits – when?

If PTE threshold is met because of –

- New construction
- Modification of existing emission unit
- Change in method of operation
- Emissions unit is major HAP source or incinerator

*Acceptable activities that can occur prior to construction*

# Construction permit threshold

<u>Pollutant</u>	<u>Threshold (Tons/Year)</u>
• PM	25
• PM10	15
• PM (ag-related)	100
• SOx	40
• CO	100
• VOC	40
• NOx	40
• Lead (or compounds)	0.6

# What ISN'T a modification?

- Routine maintenance, repair, or replacement
- Switching fuel – specific cases
- Increase in production rate or hours – as long as not prohibited by permit
- Change in ownership

# Construction approvals – when?

- Does not exceed construction permit thresholds
- Exceeds construction approval thresholds
- Emissions unit is subject to
  - NSPS
  - NESHAP/MACT

*Construction permit application form*



# Construction approval thresholds

<u>Pollutant</u>	<u>PTE</u>
• PM	5 lb/hr
• PM10	2 lb/hr
• PM/PM2.5 (Ag-related)	5 lb/hr
• SOx	2 lb/hr
• CO	50 lb/24hr
• VOC (WY/JO counties)	15 lb/24hr
• VOC (WY/JO counties)	3 lb/hr
• VOC (all other counties)	50 lb/24hr
• NOx	50 lb/24hr
• Lead (or compounds)	0.1 lb/hr

# Kansas air operating permits

- Class I operating permits (true major sources)
- Class II operating permits (potential major, actual area sources; limits PTE)

*KDHE Permit Forms and Applications*

# Major source

Stationary source with potential emissions of –

- 100 tons/yr or more of regulated pollutant (e.g., NO<sub>x</sub>, SO<sub>x</sub>, PM<sub>10</sub>, CO, VOC, lead)
- 10 tons/yr of any single HAP
- 25 tons/yr of any combination of HAPs

# Class I permits

- Combines all air quality requirements into single permit (corrects and modifies previous permits and approvals)
- Requires sources to review and correct air quality requirements
- Requires annual air emission inventory submissions

# Class I permits (cont.)

- Establishes recordkeeping, monitoring, and testing requirements
- Establishes semi-annual reporting and annual compliance certification
- Federally enforceable

# Class I permit – who needs it?

- Major source
- Affected source
- Subject to New Source Performance Standard (NSPS)
- Subject to 112(r), prevention of accidental releases
- Designated by the secretary

# Class I renewals

- KDHE has a special form for [Class I renewal applications](#)
- New forms may be required if operations have significant changes.
- Submit application six to 18 months prior to expiration of current permit.
- Contact KDHE for more information.

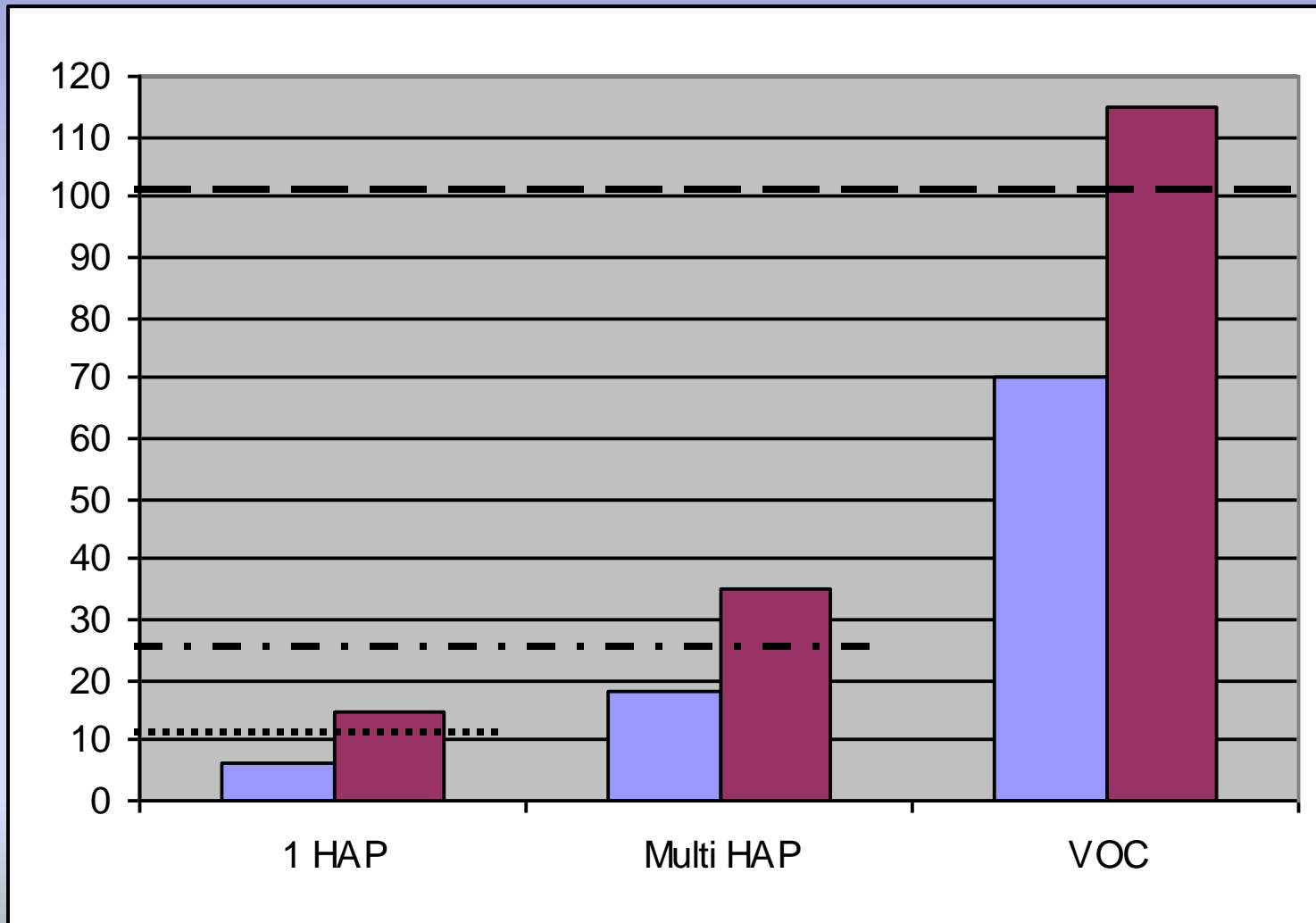
# Class II (synthetic minor) permits

- General Class II permits
- General – rock crushers
- Permit-by-rule
  - Reciprocating engines
  - Organic solvent evaporative sources
  - Hot-mix asphalt facilities
  - Sources with actual emissions less than 50% of major source thresholds



# Class II permit emission levels

Actual emissions (blue), potential emissions (red)



# Federally enforceable permit conditions

- The condition must be permanent, quantifiable, and otherwise enforceable.
- The source must be able to meet its business needs while operating under the permit conditions.

# Limiting PTE

Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of the design if the limitation or effect it would have on emissions is federally enforceable.

# Common methods of reducing PTE

- Pollution prevention
- Limit process rates
- Limit hours of operation
- Limit amount of material processed or combusted
- Add pollution control equipment
- Emission limit required by a regulation
- Combination of these

# Class II general permits

- Source proposes restrictions used to limit emissions
  - Material purchased, used, or processed
  - Hours of operation
  - Control equipment
  - Other restriction
- KDHE has specific forms for several processes and equipment.
- Recordkeeping

# Class II Permit

- Permit application
- Process/Equipment Description Form

# Class I to Class II

- Applicable if –
  - Acid rain, sulfur dioxide allowance tracking do not apply and
  - **Actual** emissions are **less than**
    - 10 tons of any HAP
    - 25 tons of any combination of HAP
    - 100 tons of NO<sub>x</sub>, SO<sub>x</sub>, PM<sub>10</sub>, VOCs, and CO

Class I permit application	Class II permit application
Process is complex, time consuming, and expensive.	Two-page application accompanied by two- to three-page equipment form(s)
\$1000 application fee	\$200 application fee
Application requires signature of responsible official.	Application requires NO signature.
Class I permit	Class II permit
Semi-annual reports	No semi-annual reports
Annual certification to KDHE and EPA	No annual certification
Annual emissions inventory—complex forms	Annual emissions inventory— one-page form: <a href="http://www.kdheks.gov/emission/classII_permit_table_03.htm">www.kdheks.gov/emission/classII_permit_table_03.htm</a>

# NESHAP/MACT

- 1970 Section 112 provisions—national emission standards for hazardous air pollutants (NESHAP)
  - EPA had to identify hazardous air pollutants (HAPs) and identify standards to prevent any adverse human health effects with “ample margin of safety.”
  - All were risk-based.
  - Courts directed EPA to determine safe air pollutant levels without technological or cost concerns.
- 1990s—maximum achievable control technology (MACT)
  - Congress saw setting health-based standards as too long and difficult, so initiated new “technology-based standards.”



# NESHAP/MACT sources

- Initially applied to major HAP sources, but now there are many area source HAP
- New sources must comply upon startup
- Existing sources comply within a period stated by the applicable standard (2-3 years)

# General MACT requirements

- Initial notification
- Recordkeeping and reporting
  - Malfunctions plus periodic startup and shutdowns must be reported.
  - KDHE has adopted all MACT standards through July 1, 2005 (K.A.R. 28-19-750); submit reports for these to KDHE, copying EPA.
- [List of MACTs](#)

# Questions?

- SBEAP: 800-578-8898
- [KDHE air permit contact list](#)