

EHS Refresher Course

Air Permitting and Compliance

Midwest Environmental Compliance Conference

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Bright ideas.
Sustainable change.

Introduction

- Imagine you are an environmental manager
- Existing source of air emissions in Missouri
- Your facility needs to install a new process
- You have been asked many questions?
 - Is an air construction permit required?
 - Operational restrictions?
 - Add-on controls needed?
 - How long until construction can begin?
 - When can we begin operation?
 - ???????



Test Case Project Description

- Existing PSD Minor source
- Title V Operating Permit
- Located in attainment area for all pollutants

- Your facility needs to install new equipment
- Will not debottleneck any upstream or downstream operations
- Good emission factor data available for the proposed equipment
- Plan to install a dust collector for control
- MHDR = 100 ton/hr – no physical restrictions
- Will not operate continuously (~10 hours/day) – operational limits possible
- Equipment not subject to NSPS or NESHAP



Calculate PTE for Existing Facility

Pollutant	De Minimis Level (ton/yr)	Facility Emissions (ton/yr)		
		Process	Fugitive	Total
PM10	15	127.71	11.17	138.89
PM2.5	10	87.92	7.69	95.61
SOX	40	13.04	0.00	13.04
NOX	40	66.54	0.00	66.54
VOC	40	23.32	0.00	23.32
CO	100	81.76	0.00	81.76
Formaldehyde	10	2.49	0.00	2.49
Total HAPs	25	6.10	0.00	6.10

- Title V Operating Permit
- PSD Minor Source
 - Subject to 250 ton/yr Threshold
- Not HAP major
- Existing facility-wide PTE should be maintained and kept current
 - Ready when you need it
 - May be required by the state

Calculate Uncontrolled Project Hourly Emissions

Pollutant	Uncontrolled Emission Factor (lb/ton)	Hourly Emissions (lb/hr)	Insignificance Level (lb/hr)
PM10	2.50E-01	25.00	1
PM2.5	6.25E-02	6.25	
SOX	9.80E-03	0.98	2.75
NOX	5.00E-02	5.00	2.75
VOC	1.75E-02	1.75	2.75
CO	6.14E-02	6.14	6.88
Formaldehyde	6.52E-03	0.65	0.5
Naphthalene	9.78E-04	0.0978	0.5

- MHDR = 100 ton/hr
- $ER = MHDR * EF$
- Can include:
 - Physical restrictions
 - Existing enforceable requirements
- Compare to the hourly insignificance level
- Significant for PM10, NOX, Formaldehyde (HAP)
- Air Construction Permit Required
- Annual insignificance level of 876 lb/yr (criteria) and SMAL (HAPs)
- Common Mistake – PM10/2.5 should include both the filterable and condensable fractions

Calculate Uncontrolled Project PTE

Pollutant	Hourly Emissions (lb/hr)	Uncontrolled PTE (ton/yr)	De Minimis Level (ton/yr)
PM10	25.00	109.50	15
PM2.5	6.25	27.38	10
SOX	0.98	4.29	40
NOX	5.00	21.90	40
VOC	1.75	7.67	40
CO	6.14	26.91	100

- Continuous operation (8,760 hours per year)
- Compare uncontrolled PTE to de minimis level
- Modeling required since > de minimis
 - Increase time required to obtain permit
 - Increase permit complexity (more restrictions)
- Facility is planning to control with a dust collector
- Operational restrictions are feasible
 - Will operate ~10 hours/day
- Tip – voluntary controls/restrictions cannot be considered unless they are enforceable

Apply add-on controls

Pollutant	Uncontrolled PTE (ton/yr)	Capture/Control Efficiency (%)	Controlled PTE (ton/yr) Baghouse
PM10	109.50	79	23.00
PM2.5	27.38	66	9.31
SOX	4.29		4.29
NOX	21.90		21.90
VOC	7.67		7.67
CO	26.91		26.91

- Calculate the controlled PTE by applying a control efficiency for the dust collector
 - Dust collector control efficiency low due to condensable fraction
 - 95-99% control only applied to filterable component
 - Controlled PM10 > de minimis (15 ton/yr)
 - Restrict PM10 < 15 ton/yr
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- Tip – Check dust collector exit concentration to ensure reasonable

Take operational limit to restrict below de minimis

Pollutant	Controlled PTE (ton/yr) Baghouse	Conditioned PTE (ton/yr)	De Minimis Level (ton/yr)
PM10	23.00	14.90	15
PM2.5	9.31	6.07	10
SOX	4.29	2.80	40
NOX	21.90	14.29	40
VOC	7.67	5.01	40
CO	26.91	17.55	100

- PM10 annual emission limit restricts all other pollutants below the de minimis level
- Modeling will not likely be required
 - MDNR can require modeling if they believe that the project could cause an exceedance of the NAAQS
 - Not typical

Calculate HAP emissions and compare to SMAL

HAP	Controlled PTE (ton/yr)	Conditioned PTE (ton/yr)	Screening Model Action Level (SMAL) (ton/yr)
Formaldehyde	2.86	1.86	2
Naphthalene	0.43	0.28	10

- Missouri specific requirement
- Other states have different requirements
- Modeling analysis is required for any HAP > SMAL
- Conditioned PTE < SMAL for all HAPs
- HAP modeling not required
- May need an annual emission limit for formaldehyde
- Permit writer may rely on the PM10 restrictions

Overview of conditions



- 3 significant permit conditions required:
- Condition #1 – Limit PM10 < 15 ton/yr
 - Reason: Avoid PM10 modeling
 - Major sources may limit to avoid PSD review
 - Assumes used as surrogate for formaldehyde
 - Some permits may include both limits
- Condition #2 – Dust Collector operational requirement
- Condition #3 – Record Keeping and Reporting

- Also have general and specific requirements that may, or may not be addressed by the permit

Condition #1 – Limit PM10 < 15 ton/yr

- **Condition 1. PM10 Emission Limitation**

- A. The permittee shall emit less than **15.0 tons of PM10** in any consecutive 12-month period from the unit. The permittee shall include all actual emissions in the limit including SSM emissions as well as any excess SSM emissions as reported to the Air Pollution Control Program's Compliance/Enforcement Section in accordance with the requirements of 10 CSR 10-6.050 Start-Up, Shutdown, and Malfunction Conditions.
- B. Attachment A or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Condition 1.A

- No CEMS, Emission limit = Operational restriction
- Tracked using static composite emission factor
- Tracked on 12-month rolling basis
- Needs to be calculated monthly
- Both SSM and Excess SSM added

- Tip – Do not use EIQ to verify compliance
 - EIQs routinely provided on audits to verify compliance with 12-mo rolling limits
 - EIQ is calendar year only
 - All tracked sources may not be significant
 - EIQ may not use emission factors required by the permit

Condition #2 – Dust Collector Requirement

- **Condition 2. Control Device Requirement-Dust Collector**

- A. The permittee shall control the unit with a Dust Collector.
- B. The dust collectors shall be operated and maintained in accordance with the manufacturer's specifications.
- C. Permittee shall maintain a copy of the dust collectors and fabric filters manufacturer's performance warranty on site.

- Dust collector cannot be considered in the PTE calculations without this enforceable condition to operate-unless inherent
- Copies of "manufacturer's specifications" and "performance warranty" need to be easily obtained during inspection
- Dust collector must operate at all times the emission unit is operating

Condition #2 – Dust Collector Requirement (Continued)

- **Condition 2. Control Device Requirement-Dust Collector**

- D. The dust collector shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. The gauge or meter shall be located such that Department employees may easily observe them.
- E. Permittee shall monitor and record the operating pressure drop across the dust collector at least once daily. Days with no operation shall be indicated. The operating pressure drop shall be maintained within the design conditions specified by the dust collector and filter manufacturer's performance warranties.

- Many facilities have gone to auto logging of pressure drop for dust collectors
- Does not require daily data examination
 - Alarms required to ensure compliance
 - Routine manual data checks recommended
- List of pressure drop design conditions should be maintained – Can be very hard to locate during an inspection

Condition #3 – Record Keeping and Reporting

- **Condition 3. Record Keeping and Reporting**

- A. The permittee shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Department personnel upon request
- B. The permittee shall report to the Department, no later than 10 days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

- Permit exceedances required to be reported within a few days of the end of the month. In Missouri, within 10 days.
- 12-month rolling emissions must be quantified early in the month to meet requirement

General and Specific Requirements



General Requirements (apply to entire facility):

- Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin
- Restriction of Emission of Visible Air Contaminants
- Restriction of Emission of Odors

Specific Requirements (apply to specific equipment):

- Restriction of Emission of Particulate Matter From Industrial Processes
- May be other requirements.
- Subject even if NOT specified in permit

Timing



- **How long until construction can begin?**
 - Pre-construction permit-so after permit is issued (3-6 months typical)
 - Some activities are allowed (site clearing and preparation, etc.)
 - Some states have specific guidance (Kansas) that allow additional activities
 - Missouri has a pre-construction waiver that allows approved construction activities prior to permit issuance (state permits only)
- **When can operations begin?**
 - Anytime after permit issuance
 - Pre-construction waiver does not include operation

Conclusion

- Existing facility-wide PTE should be maintained and kept current
- Before developing construction permit application, check significance levels and other exemptions
- Voluntary controls/restrictions cannot be considered unless they are enforceable
- Make sure you understand all state specific requirements (HAP, EJ, etc.)
- Read each draft permit condition prior to issuance and have a plan for compliance
- Read all of the general and specific requirements not included in the permit
- **Questions?**

