Demystifying WI Air Permitting Rules: Does My Wastewater Utility Need an Air Permit?

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Outline

• Overview of WI air permitting regulations
  • Permit types
  • Exemptions
  • Federal regulations

• Air permitting process
  • Calculating emissions
  • Permit applications

• Case Studies
WI Air Permitting Program

- Administered by the WDNR
- Air permits limit the amount of hazardous air pollutants discharged to the atmosphere
- All air pollution sources require a permit unless they are determined to be exempt
  - There are many exemptions in the regulations
Types of Permits

- Type A Registration Permit
  - Easiest permit to obtain
  - Covers the entire facility
  - Allows both construction and operation
  - Must remain below an emission threshold

- Construction Permit
  - Covers installation of specific equipment

- Operation Permit
  - Covers entire facility
  - Can be complex
Easiest to Start with Exemptions

- Exemptions are outlined in NR 406 and NR 407
- WWTP is exempt if it consists only of emergency generators and heating equipment
  - Generator is emergency only
  - Natural gas or oil fired HVAC

- Facility may still be exempt…
More Detailed Exemptions

- WWTP is exempt if it meets all the following:
  - Emissions below 10 ton/yr for NOx, SOx, VOC, PM, CO
  - Cannot be subject to New Source Performance Standards (NSPS) requirements
Federal Regulations - NSPS

- What’s subject to NSPS limits?
  - Diesel engines manufactured after April 1, 2006
  - Natural gas/biogas engines manufactured after ~2007/2008 (depends on HP)

- **Bottom line:** newer non-emergency engines require an air permit
Federal Regulations - NESHAP

- What about NESHAP (RICE) rules?
  - Much more complicated
  - Depends on engine type, size, and fuel
  - Rules were just finalized in early 2013
- Some items required by NESHAP
  - Performance testing
  - Air pollution control devices
- Older emergency generators can still be exempt from permitting
Exemptions – Follow Through

- Document your conclusions
  - List equipment at your facility
  - Include sizes, fuel type, year manufactured, run times
- Discuss with your engineer and/or the WDNR
- Send an optional exemption form to the WDNR

Notice of Intent
Under the Actual Emission Exemption
ss. NR 406.04(1q) or NR 407.03(1m), Wis. Adm. Code.
Optional form (revised 9/07)

Notice: By submitting this form you are notifying the department of your intent to (1) construct or modify an emission unit under s. 406.04(1q), Wis. Adm. Code, or (2) operate a facility under s. NR 407.03(1m), Wis. Adm. Code.
Summary of WI Air Permitting

- Permits are administered by the WDNR
  - Required for all facilities unless exempt
- Several different ways to be exempt
  - Only emergency engines and typical heating equipment
  - Not subject to NSPS and < 10 ton/yr emissions

I Have a Non-Emergency Engine
I Have a Newer Engine and Biogas
I Have High Emissions

More Detailed Review
Air Permitting Process

- Compile the emission sources
  - Include collection system
- Calculate emissions for all equipment
- Determine type of permit required
- Communicate with WDNR
- Complete air permit application
Data Needed for Emission Sources

• Compile list of all equipment with emissions
• Engines:
  • Size, year manufactured, fuel type, annual run time
• Boilers:
  • Size, fuel type, annual fuel used
• Waste gas burners:
  • Annual fuel used
• Heating equipment:
  • Size, annual natural gas use
Calculating Emissions

- Calculate **actual** and **maximum theoretical emissions**
  - Actual emissions – based on actual run times/fuel use
  - Maximum theoretical – 24/7, 365 days per year
- Use manufacturer’s emissions rates when available
- Convert emissions into tons/year
- Example: calculate CO emissions from engine
  \[(500 \text{ hp})(2.0 \text{ g/hp/hr })(10 \text{ hr/yr}) = 10,000 \text{ g CO/yr}\]
  \[(10,000 \text{ g CO/yr})(1 \text{ lb/454 g})(1 \text{ ton/2,000 lb}) = 0.011 \text{ ton CO/yr}\]
Using AP-42 Emission Factors

- AP-42 emission factors are available on EPA’s website
  - Use when manufacturer data not available
- Example:

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Gasoline Fuel (SCC 2-02-003-01, 2-03-003-01)</th>
<th>Diesel Fuel (SCC 2-02-001-02, 2-03-001-01)</th>
<th>EMISSION FACTOR RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO_x</td>
<td>Emission Factor (lb/hp-hr) (power output)</td>
<td>Emission Factor (lb/MMBtu) (fuel input)</td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>6.96 E-03d</td>
<td>0.99d</td>
<td>D</td>
</tr>
<tr>
<td>SO_x</td>
<td>5.91 E-04</td>
<td>0.084</td>
<td>D</td>
</tr>
<tr>
<td>PM-10b</td>
<td>7.21 E-04</td>
<td>0.10</td>
<td>D</td>
</tr>
</tbody>
</table>
**Air Permit Flow Chart**

Does the facility have biogas production?
- **Yes** → Are emissions below 10 ton/yr (NOx, SOx, VOC, PM, CO)?
  - **Yes** → Is engine (if present) subject to NSPS?
    - **Yes** → Air permit is required.
    - **No** → Facility is exempt.
  - **No** → Is generator emergency only?
    - **Yes** → Facility is exempt.
    - **No** → Facility is exempt.

The flowchart outlines the decision-making process for determining if an air permit is required based on various criteria related to biogas production and emissions.
I Need a Permit, Now What?

• Determine what type of permit will be applied for
• Recall different types of permits
  • Registration permit
  • Construction permit
  • Operation permit
Registration Permits

- **Type A Registration Permit**
  - Places a cap on emissions at 25 ton/yr NOx, SOx, VOC, PM, CO
  - Facility can’t be subject to a Best Available Control Technology (BACT) review
  - Stacks must be vertical and unobstructed

- **Many benefits**
  - Construct/replace equipment
  - Simplified permit application with less cost
  - DNR decisions in < 15 days
Construction Permits

• Construction Permit
  • Required for construction/modification when a Type A Registration Permit cannot be used
  • Valid for 18 months
• Initial $7,500 fee applied to application
  • Processing, emission testing, modeling, etc.
• An operation permit is required following construction
Operation Permits

- Operation Permit
  - Required when a Type A Registration Permit cannot be used
- Must be renewed every 5 years
- Covers operation of all equipment at facility
Air Permit Flow Chart - Expanded

Does the facility have biogas production?

Yes → Are emissions below 10 ton/yr (NOx, SOx, VOC, PM, CO)?

No → Is generator emergency only?

Yes → Facility is exempt.

No → Is engine (if present) subject to NSPS?

Yes → Are emissions below 25 ton/yr (NOx, SOx, VOC, PM, CO)?

No → Construction/Operation permit required.

Yes → Air permit is required.

Are stacks vertical/unobstructed?

Yes → *Registration permit required.

No ⤴

*Confirm with WDNR. Performance testing and/or special review for new engines may not allow registration permit.
Discussion with the WDNR

- Many fact sheets are available online
- Communicate with WDNR throughout process
- Each facility is unique
- Discuss before starting the application process
Air Permit Application Process

• Registration permit applications
  • Downloadable PDF form
  • Submit to WDNR
  • Response within 15 days

• Construction/operation permit applications
  • Multiple forms required
  • May be submitted in one application
Example – Exempt Facility

• Small treatment plant with oxidation ditch
  • No anaerobic digestion
  • Emergency generator
  • Natural gas heating equipment

• Facility consists of only an emergency generator and heating equipment
Example

• Watertown WWTP
  • Newer emergency generator (subject to NSPS)
  • Facility also has flare, boiler, etc.
  • Well under 25 ton/yr

• Qualified for Registration Permit
Example

- Fond du Lac WWTP
  - New biogas generator
  - Formaldehyde emissions were a concern, requiring a BACT review
- Required a standard Operation Permit application
  - Fairly complicated, > 100 pages

Fond du Lac biogas engine.
Conclusions

- Begin process looking at exemptions
- Determine whether NSPS/NESHAP has an effect
- Compile list of equipment & calculate emissions
- Determine type of permit to apply for
- Discuss with WDNR before starting the application
- Complete application & submit to WDNR
Acknowledgments

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- Watertown WWTP
- Fond du Lac WWTP