Breaking the LFGTE Permit Log Jam

Federal Combustion Rules put States on Shaky Ground

16th Annual LMOP Conference and Project Expo

Presented by Matt Lamb, Sr. Scientist

January 31, 2013
State of LFGTE Permitting in North Carolina

Log Jam at Taylors Falls 1884
Who is affected?

- Private developers seeking to permit gensets
- Universities pursuing carbon footprint reduction
- County governments scrambling to meet ARRA deadlines
- State Energy agency administering EECBG funds
- Private landfill operators facing NSPS deadlines
What is the Cause?
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What is Solid Waste?
What is Contained Gaseous Material?
What is Solid Waste?

- Commercial and Industrial Solid Waste Incineration (CISWI) and Non-Hazardous Secondary Materials (NHSM) Rule amendments:
  - Deleted exemptions for generators
  - Redefined the term “contained gaseous materials”
  - Comments, rule stays, reconsiderations, lawsuits, and court orders
  - Amended rules remained in effect
  - Unattainable CO limit of 157 ppm
Conflicting Comfort

- EPA issued several “comfort” letters
  - American Forest and Paper Assoc. (May 2011)
  - Waste Management, Inc. (August, 2011)
  - “burning of gaseous material... does not involve treatment or other management of a solid waste”

  BUT

  - “Landfill gas is not a traditional fuel”
  - NC DAQ confused by conflicting guidance
  - Burden of proof on permittee
Two Paths to Permits
1. Schedule of Compliance

- DAQ offered “Schedule of Compliance”
  - DAQ issues permit but considered permit holder non-compliant with CISWI
  - Offers SOC generous enough to allow reconsideration to become final
  - Risk borne by permittee
  - Difficult to finance a project that is non-compliant from day one
2. Force EPA Determination

- DAQ issued CISWI permit for an LFG flare
  - DAQ hopes during EPA review CISWI would be determined non-applicable

\[\text{OOPS}\]

- EPA issued permit as written, with CISWI conditions intact
A Third Way

Legitimacy Test

Demonstrate that landfill gas:

1. Remains in control of the “generator”
   OR
2. Is managed as a valuable commodity
3. Has significant heat content
4. Has contaminant levels comparable to traditional fuel
Cooperative Effort with DAQ

- Natural gas contaminants are difficult to identify/quantify
- Evaluation of LFG contaminants against emission limits/factors

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>ppmv (unless otherwise noted)</th>
<th>Source</th>
<th>Source</th>
<th>MW</th>
<th>CFM</th>
<th>lb/hr</th>
<th>tpy</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Natural Gas</td>
<td>LFG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Nitrogen</td>
<td>3,100 - 25,000</td>
<td>Perry's Handbook</td>
<td>262,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NOx emission rate same as natural gas-fired engines</td>
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<tr>
<td>Sulfur</td>
<td>0.34 ppmw</td>
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<td>See sulfur compounds below</td>
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<tr>
<td>Hydrogen Sulfide</td>
<td>1,800</td>
<td>Ohio Raw Gas Sample</td>
<td>336</td>
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<td>Lower than Traditional Fuel</td>
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<tr>
<td>Metals</td>
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<td></td>
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<tr>
<td>Arsenic (As)</td>
<td>35.5 - 86.5</td>
<td>EPA/OAQPS Survey for Final NHSM Rule</td>
<td>0.004</td>
<td>74.9</td>
<td>519</td>
<td>2.42074E-05</td>
<td>0.00011</td>
<td>Lower than EPA de minimis</td>
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<tr>
<td>Beryllium (Be)</td>
<td>20.3 - 45.6</td>
<td>EPA/OAQPS Survey for Final NHSM Rule</td>
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<td>Lower than EPA de minimis</td>
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<tr>
<td>Cadmium (Cd)</td>
<td>3.6 - 8.3</td>
<td>EPA/OAQPS Survey for Final NHSM Rule</td>
<td>0.00098</td>
<td>112</td>
<td>519</td>
<td>8.86852E-06</td>
<td>0.00004</td>
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<tr>
<td>Chlorine (Cl)</td>
<td>2140 - 2870</td>
<td>EPA/OAQPS Survey for Final NHSM Rule</td>
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<tr>
<td>Chromium (Cr)</td>
<td>164.3 - 274.6</td>
<td>EPA/OAQPS Survey for Final NHSM Rule</td>
<td>0.008</td>
<td>52</td>
<td>519</td>
<td>3.36125E-05</td>
<td>0.00015</td>
<td>Lower than EPA de minimis. The hexavalent was used as the most protective assumption</td>
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<tr>
<td>Lead (Pb)</td>
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<td>EPA/OAQPS Survey for Final NHSM Rule</td>
<td>0.005</td>
<td>207</td>
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<td>8.36271E-05</td>
<td>0.00037</td>
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Success!

- Three landfill gas to energy projects permitted
  - Developer
  - University
  - County
- All three are currently under construction
December 21, 2012: Reconsideration Rules are finalized

Previous definition of “contained gaseous fuels” reinstated as:

“...gases that are in a container when the container is combusted”
Rule implementation within 60 days of publish date

To date, no notice has been published in the Federal Register
Acknowledgements

Amy Bannister with Waste Management

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EPA Region 4

Landfill Methane Outreach Program

North Carolina Department of Air Quality

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