PULP & PAPER INDUSTRY PERSPECTIVE ON NO2 AND SO2 MODELING METHODS

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The American Forest & Paper Association is the national trade association of the forest products industry, representing pulp, paper, packaging and wood products manufacturers, and forest landowners.

The forest products industry accounts for approximately 5 percent of the total U.S. manufacturing GDP. Industry companies produce about $190 billion in products annually and employ nearly 900,000 men and women, exceeding employment levels in the automotive, chemicals and plastics industries.

The industry meets a payroll of approximately $50 billion annually and is among the top 10 manufacturing sector employers in 47 states.
Industry Perspective

- Pulp & paper mills are “major sources” but generally well-controlled industrial operations
- Heavily regulated sector...past, present, and future
  - Industrial Boilers (NSPS Subparts D x , Boiler MACT)
  - Chemical Recovery (NSPS Subpart BB, SIP standards)
  - Boiler MACT
  - BART/Regional Haze
  - Residual Risk/Technology Review
Challenges

Like many industrial sectors, pulp & paper mills find it difficult to demonstrate compliance with applicable NAAQS following current EPA modeling guidance resulting in numerous consequences...

- New projects cannot move forward until modeling issues are resolved
- Existing operations without projects may be required to evaluate controls as part of SO2 SIP Development and Implementation
- “Better than BACT” levels of control may be necessary to demonstrate compliance, which may require...
  - ...significant capital investments in new or upgraded controls
  - ...“on-paper” reductions to permit limits
  - ...reduced fuels/operational flexibility
AIWG Sector Findings

Total = 97.9 g/s
777 lb/hr

Total = 46.9 g/s
372 lb/hr

Table 3. SO₂ modeling results.

<table>
<thead>
<tr>
<th>Facility</th>
<th>Emissions (tpy)</th>
<th>Maximum DV (µg/m³)</th>
<th>Sensitivity test</th>
<th>Maximum DV (µg/m³)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulp &amp; paper</td>
<td>Base: 3,403</td>
<td>924 (353); 28% receptors exceed</td>
<td>Stack height increase &amp; controls; Emissions 1,630</td>
<td>212 (81); &lt;1% receptors violate;</td>
<td>Exceedances &lt; 4 km for base case; Exceedances &lt; 1 km for stack ht increase &amp; controls</td>
</tr>
</tbody>
</table>

http://www.epa.gov/ttn/scram/10thmodconf/review_material/AIWG_Summary.pdf
SO2 Impacts

- AF&PA analyses suggest SO2 impacts generally below the standard for typical mills

- Even sources at 50% or less than 3-hour/24-hour SO2 NAAQS can be > 2x 1-hour SO2 NAAQS

- AF&PA recommends variable emissions processing to account for fuel/operational flexibility (i.e., coal vs. biomass)

- Tier 3 background methods likely to be important for attainment demonstrations

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Value</th>
<th>Mill A</th>
<th>Mill B</th>
<th>Mill C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission Rate</td>
<td>SO2 lb/hr</td>
<td>96.60</td>
<td>866.06</td>
<td>280.20</td>
</tr>
<tr>
<td>24-hour Current</td>
<td>H2H</td>
<td>97.24</td>
<td>171.42</td>
<td>53.95</td>
</tr>
<tr>
<td>3-hour Current</td>
<td>H2H</td>
<td>116.62</td>
<td>381.06</td>
<td>121.52</td>
</tr>
<tr>
<td>1-hour Current</td>
<td>H4H</td>
<td>108.14</td>
<td>440.04</td>
<td>118.96</td>
</tr>
<tr>
<td>1-hour BACT</td>
<td>H4H</td>
<td>108.14</td>
<td>78.09</td>
<td>100.98</td>
</tr>
</tbody>
</table>
NO2 Impacts

- AF&PA analyses suggest NO2 impacts generally below the standard – but Tier 3 methods likely routinely needed

- Typical pulp mill combustion sources have NO2/NOX in-stack ratio of approximately 2%

- AF&PA recommends streamlined Tier 3 NO2 modeling
  - Updated PVMRM/OLM algorithms
  - Authority to approve at state/local level
  - Availability of QA’d background concentrations (O3, NO2) needed for Tier 3 models and Paired Sums

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</tr>
</thead>
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<tr>
<td>Emission Rate</td>
<td>NOX lb/hr</td>
<td>333.10</td>
<td>500.80</td>
<td>485.10</td>
</tr>
<tr>
<td>1-hour Current</td>
<td>Tier 2 (80% ARM) H8H</td>
<td>367.93</td>
<td>452.62</td>
<td>103.64</td>
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<tr>
<td>1-hour Current</td>
<td>Tier 3 (OLM) H8H</td>
<td>87.30</td>
<td>90.70</td>
<td>67.99</td>
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<tr>
<td>1-hour Current</td>
<td>Tier 3 (PVMRM) H8H</td>
<td>51.88</td>
<td>77.14</td>
<td>46.06</td>
</tr>
</tbody>
</table>
Observations / Comments

- AF&PA analyses suggest AIWG study may overstate pulp & paper industry impacts
- AF&PA appreciates efforts to...
  - ...improve upon Tier 3 NO2 models
  - ...identify and correct systematic deficiencies in model performance
- AF&PA promotes reasonable, practical implementation of new standards and modeling guidance
  - Critical application of EPA guidance in practice to provide stability during regulatory implementation periods
  - Revisit traditional approaches (ambient air, variable emissions)
  - Streamlined approval of Tier 3 approaches