

May 2, 2006

Contacts – Aliya M. Khan and Yogesh Doshi

Workgroup Recommendations and Other Potential Control Measures
Stationary Combustion Sources Workgroup

SCS003 – ICI Boilers

<p>Control Measure Summary:</p> <ul style="list-style-type: none"> - Revise Subchapter 19 emission limits of NOx for boilers 10 – 250 MMBtu/hr for natural gas and distillate oil. - Revise Subchapter 9 fuel sulfur limit for distillate oil from 0.2% sulfur by weight in two phases, first to 0.05% sulfur by weight, second to 15 ppm for entire New Jersey - Revise Subchapter 9 fuel sulfur limit for residual oil from 2.0% sulfur by weight to 0.3% sulfur by weight for entire New Jersey 	<p>Emissions (tons/year) in New Jersey</p>	
<p>2002 existing measures: NSR; PSD; State SOTA; State RACT</p>	<p>Uncontrolled (Includes state RACT)</p>	
<p>Candidate measure 1: Lower NOx emission limits on small to medium size boilers to reflect 50% reduction in emissions by the Installation of Low NOx Burners <i>Measure ID:</i> LNB <i>Emission reductions:</i> 50% reduction in NOx from 2002 levels <i>Control Cost:</i> \$2,500-\$3,500 \$ per ton of NOx removed <i>Timing of Implementation:</i> By year 2009 <i>Implementation Area:</i> New Jersey *using DOE growth factors for commercial boilers, and using the natural gas growth factor for dual fuel boilers</p>	<p>NOx: 2009 1600 Projected*: <u>2009</u> <u>-800</u> <u>800</u> Reductions: NOx in 2009:</p>	<p>1500 1300</p>
<p>Candidate measure 2: Use of Ultra Low Sulfur Fuel (15 ppm): <i>Measure ID:</i> Revise fuel sulfur limit for heating oil <i>Emission reductions:</i> 75% reduction in SO2 from 2002 levels for boilers using #2 oil; 85% reduction in SO2 from 2002 levels for boilers using #6 oil <i>Control Cost:</i> TBD <i>Timing of Implementation:</i> By year 2009 <i>Implementation Area:</i> New Jersey **This number is a subset of HR001</p>	<p>SO2: 2009 Projected: 2009 1900** Reductions distillate -300 <u>residual</u> <u>-1300</u> 300 SO2 in 2009:</p>	<p>1900**</p>

Disclaimer – The recommendations contained within this white paper do not constitute official state decisions nor reflect any pending regulatory or nonregulatory actions. The NJDEP welcomes public feedback on this (or any other) white paper through June 16, 2006.

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Policy Recommendation of State/Workgroup Lead:

Adopt rules requiring lower NO_x emission limits on all ICI boilers less than 250 MMBtu/hr (50% NO_x

reduction by 2009) achieved with advanced low NO_x combustion.

Adopt rules requiring lower sulfur limits for heating oil as fuel. Phase 1 is a 75% reduction in SO₂ from 2002 levels for boilers using #2 oil, and 85% reduction in SO₂ from 2002 levels for boilers using 2% sulfur #6 oil (70% reduction for 1% sulfur #6 oil). Phase 2 for light heating oil would be the same as for ultra low sulfur diesel fuel (ULSD, 15 ppm) by 2014.

Brief Rationale for Recommended Strategy:

Low NO_x Burners (LNBs)

LNBs are used to control NO_x emissions from boilers of all sizes. They can be retrofitted on existing boilers. These burners are expected to reduce NO_x emissions by 50%. In 2002, the total actual emissions for 142 boilers between 13 and 250 MMBtu/hr was approximately 2000 tons per year (PTE=6400 tons per year). Out of these 142 boilers, 56 already have LNB with actual emissions of 500 tons per year. Most boilers that do not have controls are small boilers less than 50 MMBtu/hr (about 58 boilers). Hence installing LNB on the remaining 86 boilers (actual emissions = 1500 tpy) will reduce potential NO_x emissions by 750 tons per year. If all the boilers without any NO_x controls in the State of New Jersey are required to install this control technology at a minimum then, over 750 tpy of NO_x emission reductions at 2002 levels could be expected. With the 2009 projections the reduction would be 800 tpy of NO_x emissions. Also large boilers with first generation LNB (about 30% NO_x reduction) should be upgraded with advanced LNB (over 50% reduction), or the equivalent.

Low Sulfur Fuel

Currently 0.05% sulfur No. 2 and 0.3% sulfur in No. 6 fuel oil is available. No. 2 fuel oil sources switching from 0.2% to 0.05% sulfur would potentially result in a 75% reduction in SO₂ emissions, or approximately 250 tons per year statewide. Similarly, for No. 6 fuel oil sources, switching from 2.0% to 0.3% sulfur content would potentially reduce SO₂ emissions by 85%, or approximately 800 tons per day. This measure would impact not only the point sources, but also the area sources such as home heating, yielding even greater reductions of SO₂ emissions. This measure also has the collateral benefit of reducing particulate matter (PM) emissions. Many New Jersey sources are currently using low sulfur fuel oil. Additionally, ultra low sulfur fuel oil (0.0015 % sulfur content) will soon be available. Use of ultra low sulfur fuel, when available, will reduce SO₂ and PM emissions even further.