

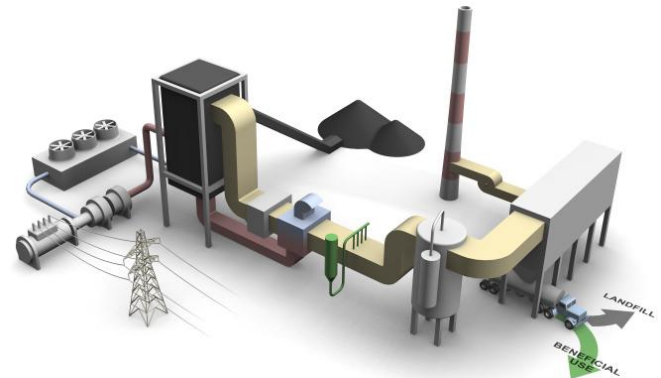
Novinda Corporation

McIlvaine Hot Topic Hour
Mercury Sorbent Options
July, 2014



Company Overview

- Advanced Patented Product Platform
 - Air Quality Products for coal-fired utility and industrial boilers
 - Mercury control – Flagship product – Amended Silicates™
- Technology
 - AS-HgX (2nd gen) Production & Shipping began April 2013
 - 2014 New Product Rollouts
 - Oxidation Product
 - ESP Performance Enhancement (Fly Ash Resistivity Modifier)
 - AS-HgX-ESP (4th Gen): PRB / CS-ESP High Performance Hg Removal
- Business
 - > 50 Full Scale Plant Tests Completed
 - MATS Compliance in Wet FGD, Dry FGD, CS-ESP configurations/Bit, PRB/sub-bit
 - Environmental Services -
 - Mobile Hg CEMS
 - Sorbent injection services



Why Novinda

Novinda's Amended Silicates Product – Non Carbon

- Powerful Hg oxidation and removal reactions
- Delivers 40% - 75% Savings: More Efficient / No Additives Required
- Preserves Fly Ash for Resale Into Concrete Products
- Cleaner Way to Remove Mercury – 10% of CO₂
- No Damage to Plant Components & Non Flammable



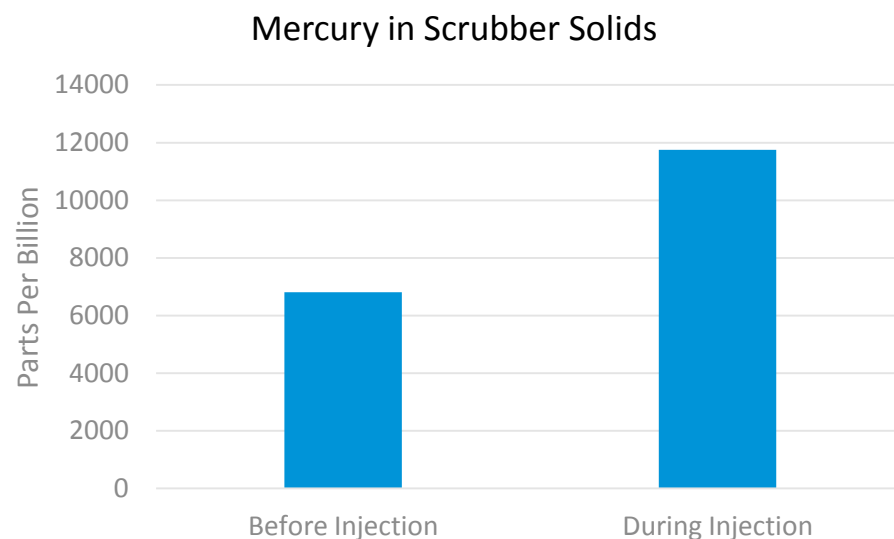
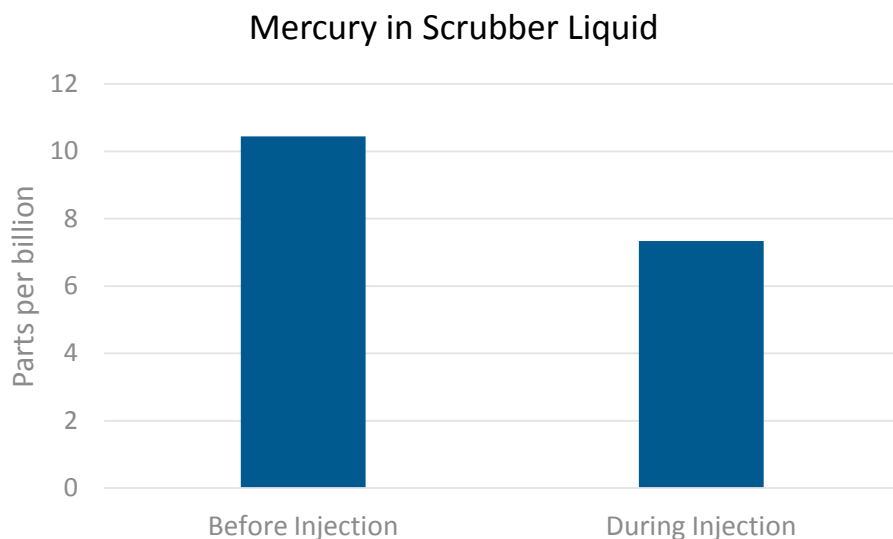
Benefits of Amended Silicates

- ✓ Outstanding Hg Oxidation & Capture
- ✓ Broad Operating Temperature
- ✓ Powerful Non-halogen Oxidation
- ✓ Reduced Corrosion
- ✓ Preservation of Fly Ash (Direct Use in Portland Cement)
- ✓ Reduction of Fly Ash Resistivity
- ✓ Will Not Contaminate Waste Water
- ✓ Passes Landfill Leachability Tests (EPA Methods 1311 & 1313)
- ✓ Non-flammable / “0” Explosibility (ASTM E1226-10)

Re-Emission Prevention by AS HgX

- Amended Silicates capture mercury in the form of mercuric-sulfide complexes on the particle surface.
- Some of the mercury is released in an oxidized form that is more effectively captured and retained in wet scrubbers than typical oxidized mercury in coal-fired power plants.
- Amended Silicates that reach the scrubber will release sulfide components into the scrubber. The range of solubility of the sulfides released from the Amended Silicates covers a wide pH range, which allows them to react with dissolved mercuric compounds and remove them in the wet scrubber, thus mitigating mercury re-emission.

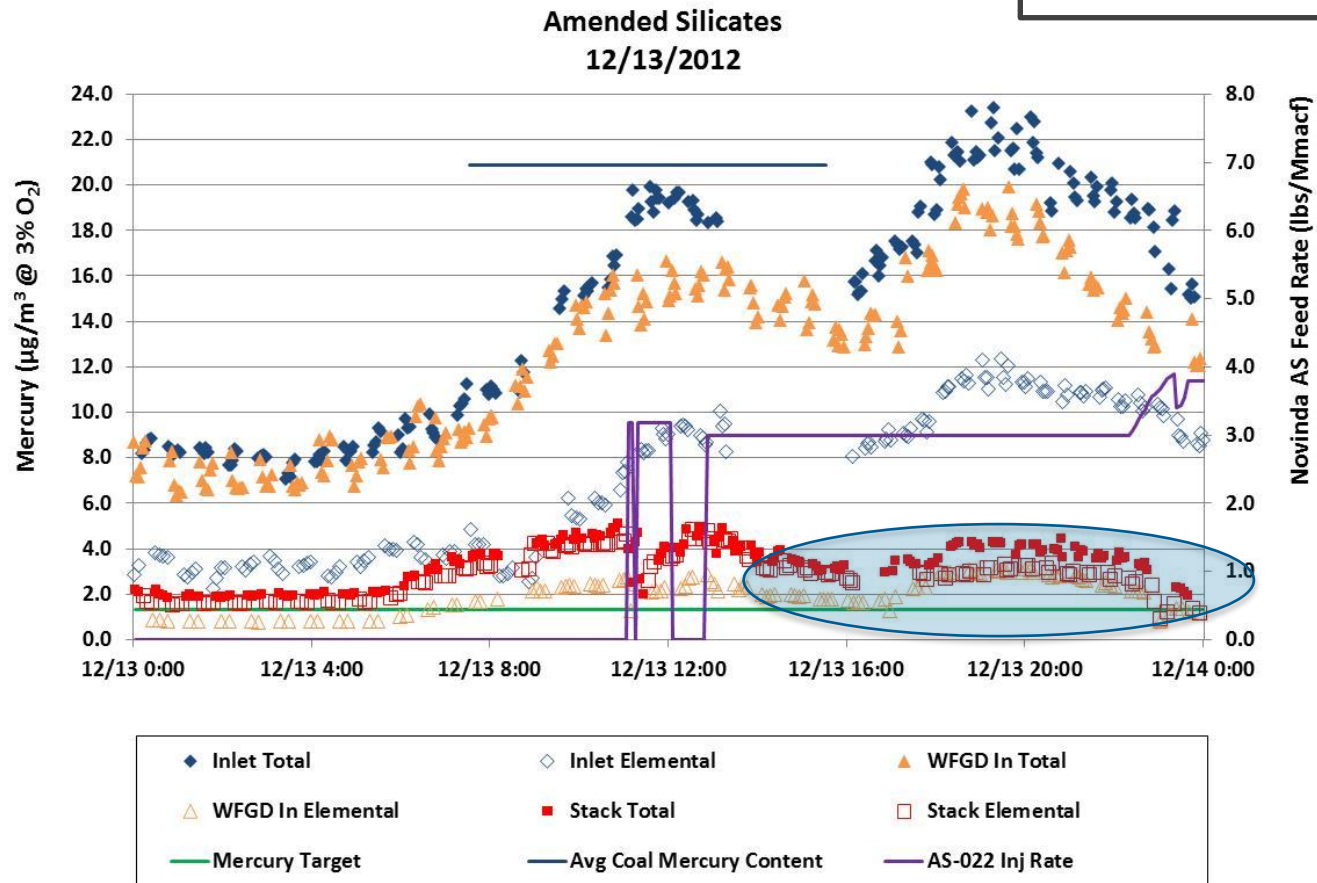
Re-emission Example (eastern bit. coal)



The mercury in the scrubber liquid phase is currently identified as most susceptible for reduction to elemental form and subsequent re-emission. At this plant we have shown 30% reduction in mercury in the scrubber liquid, with a balancing increase in mercury in the solids (inert) by 70%.

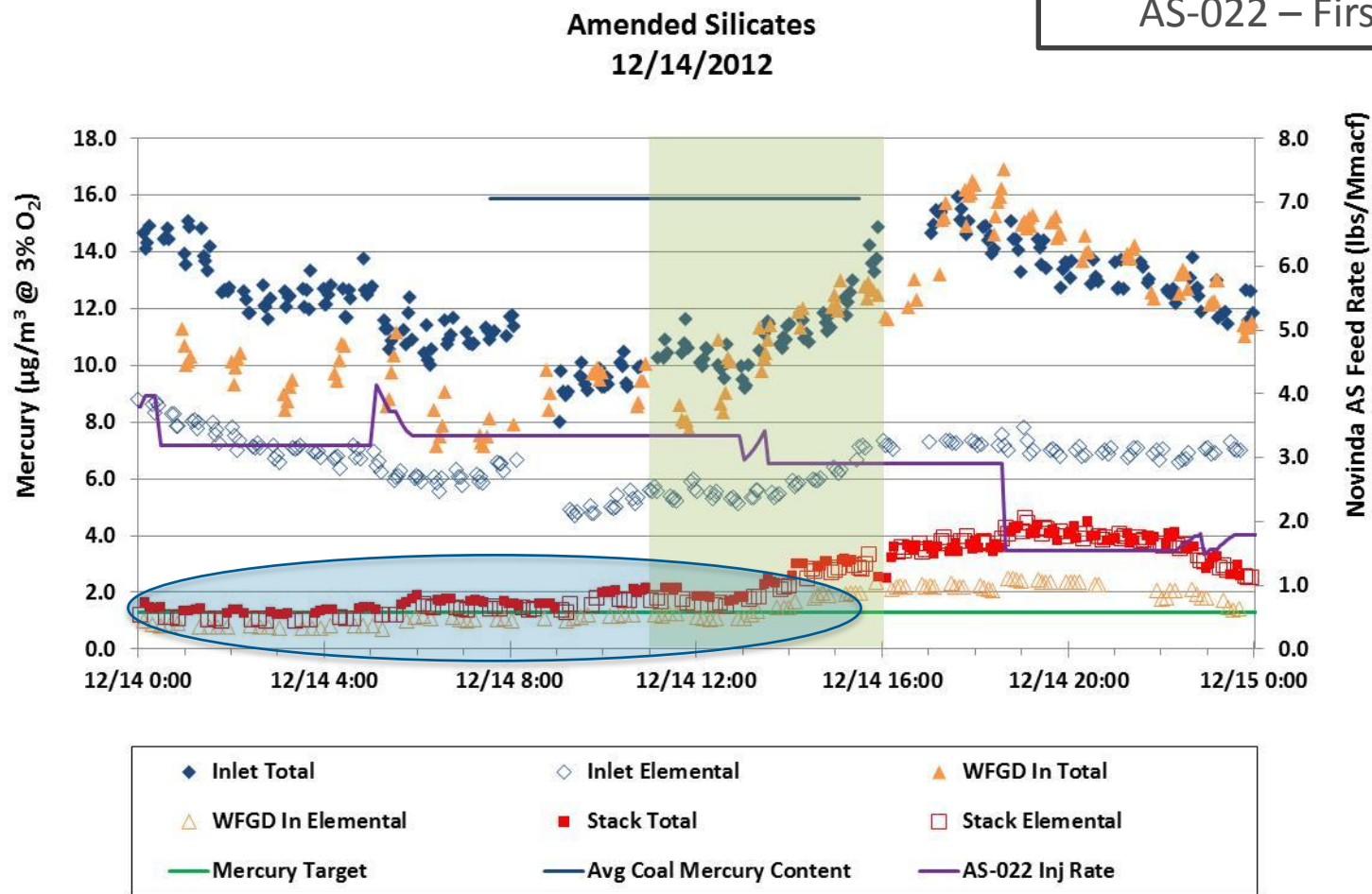
AS Injection Reduces Hg Re-emission

AS-022 – First Gen



Shaded Oval – Minimum re-emission

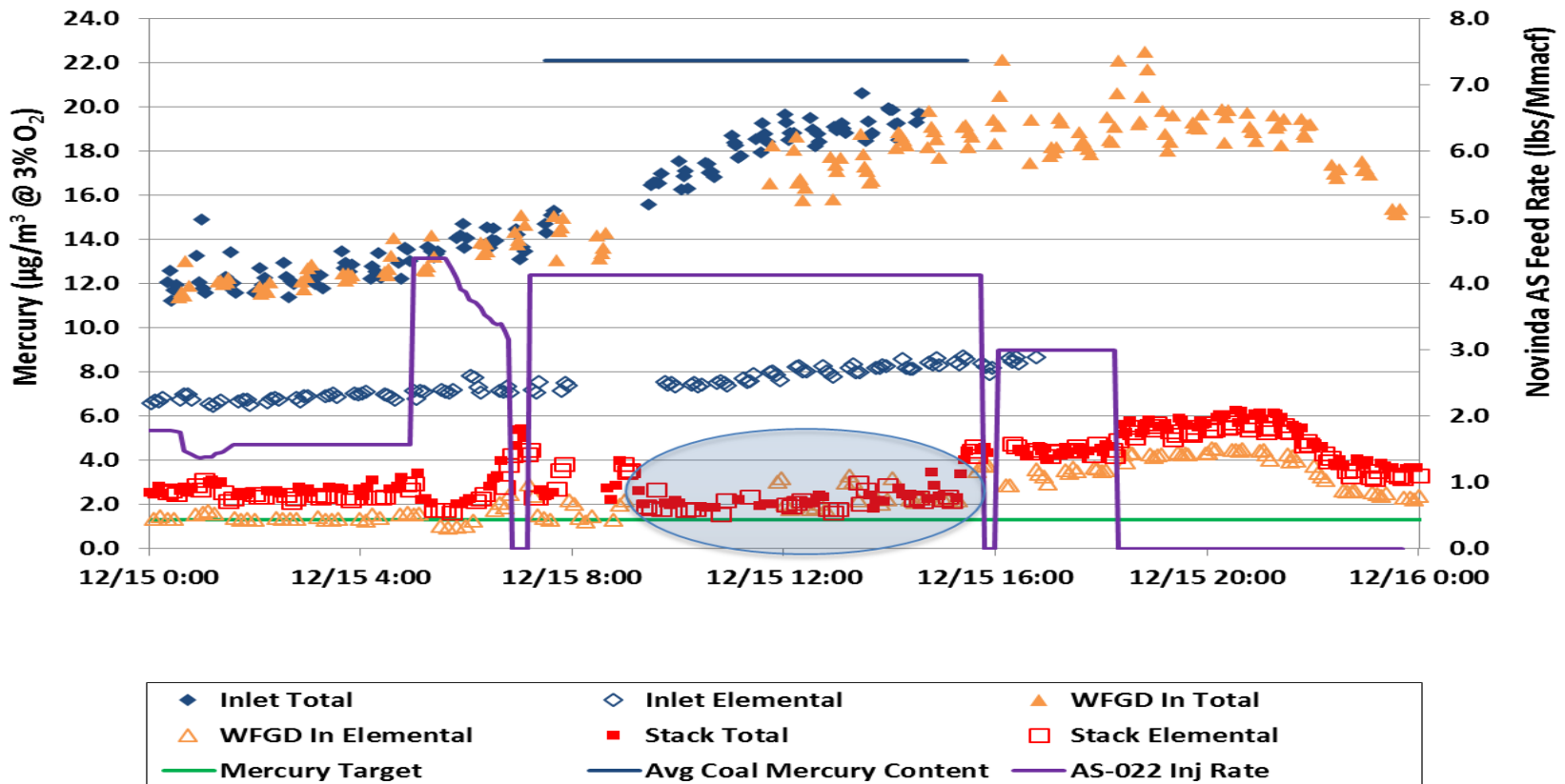
AS Injection reduces Hg re-emission



Shaded Oval – Minimum re-emission

AS Injection reduces Hg re-emission

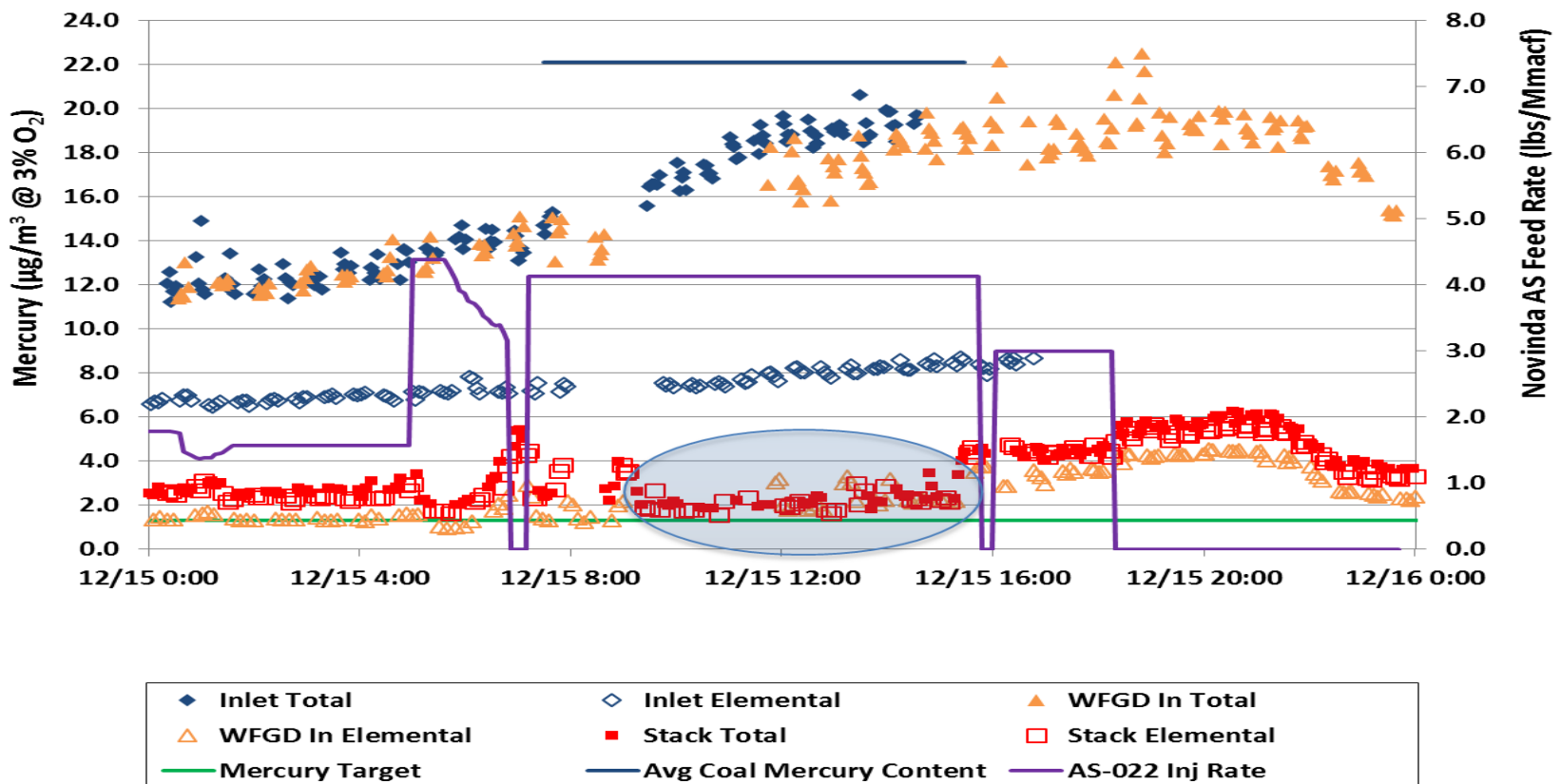
AS-022 – First Gen



Shaded Oval – Minimum re-emission

AS Injection reduces Hg re-emission

AS-022 – First Gen

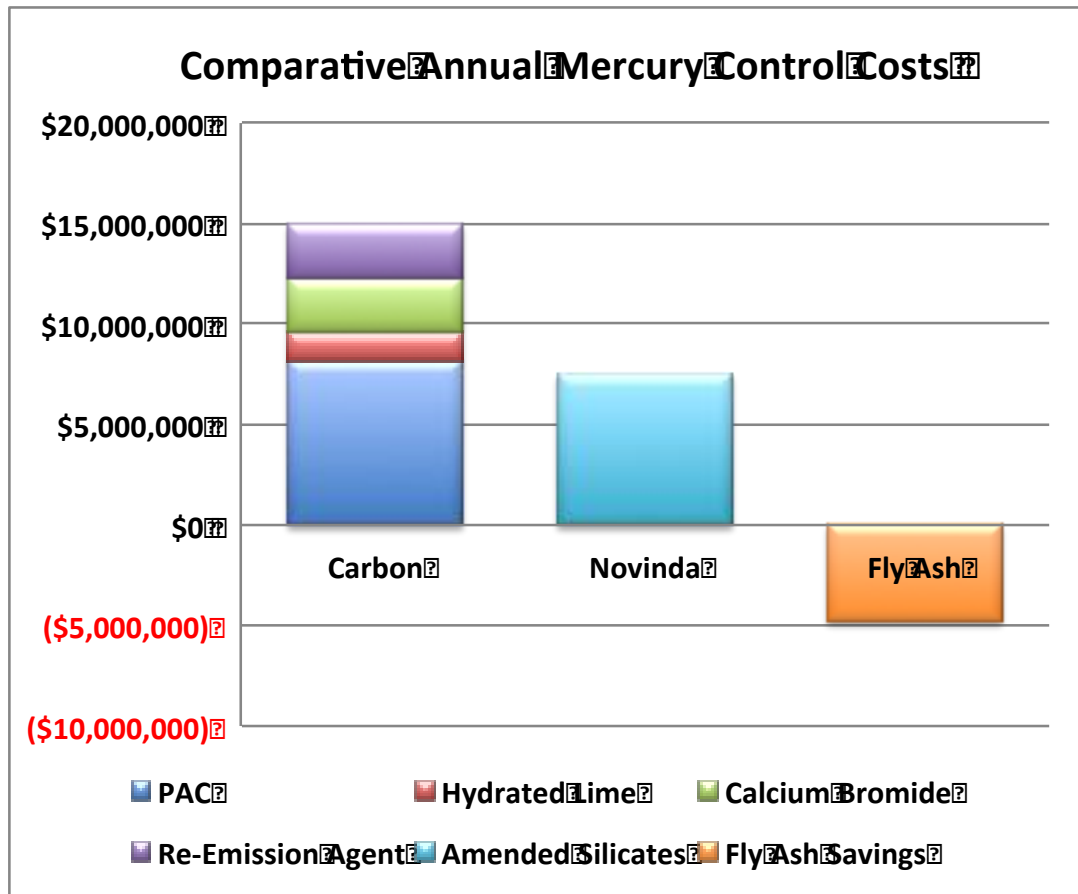


Shaded Oval – Minimum re-emission

Outstanding Economics

Higher Hg Removal Performance & Preserves Fly Ash Revenues

Example - 760 MW Power Plant Test

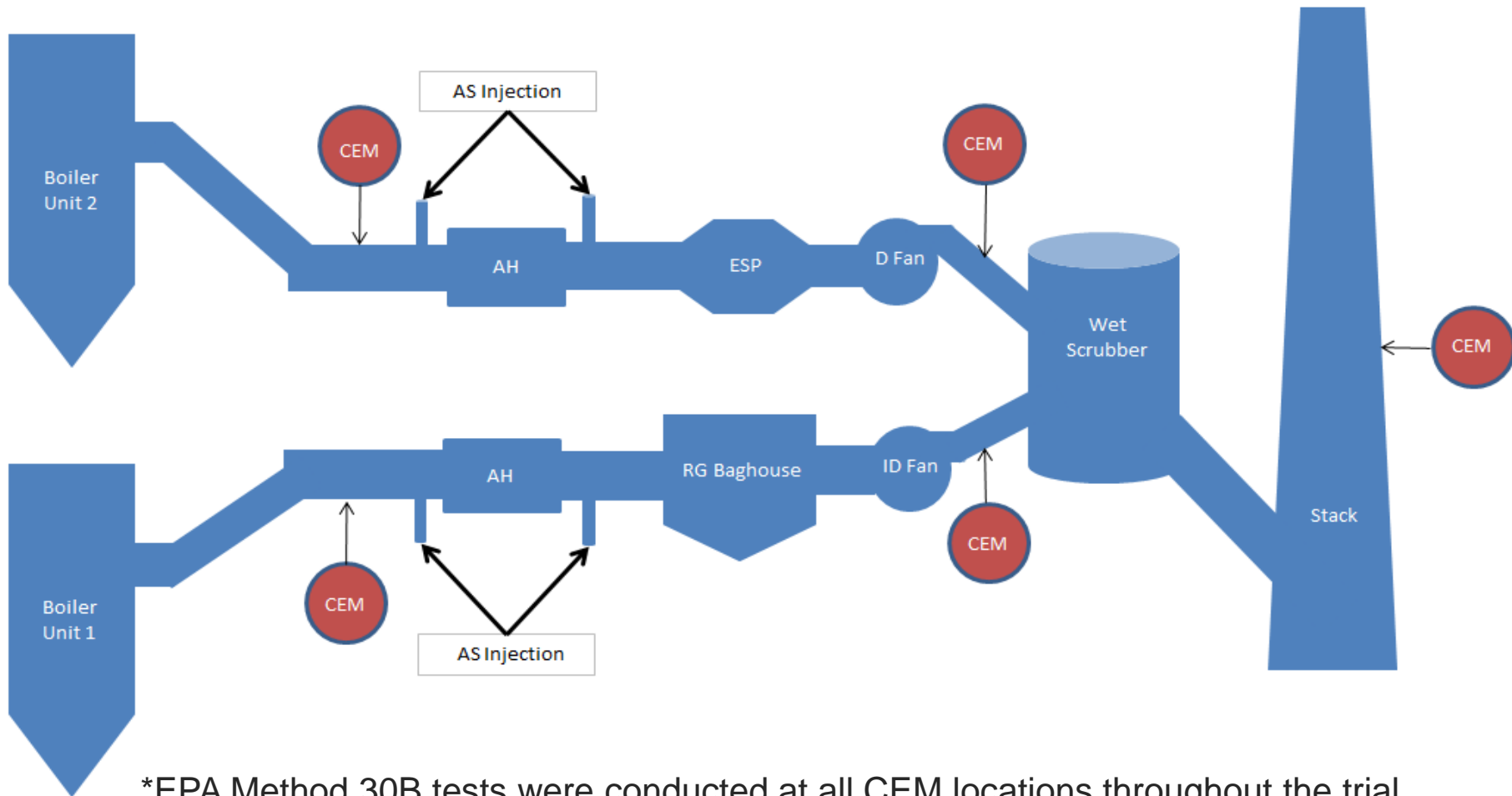


\$7.5M Hg Removal Savings (50%)

\$4.8M Fly Ash Revenue Savings

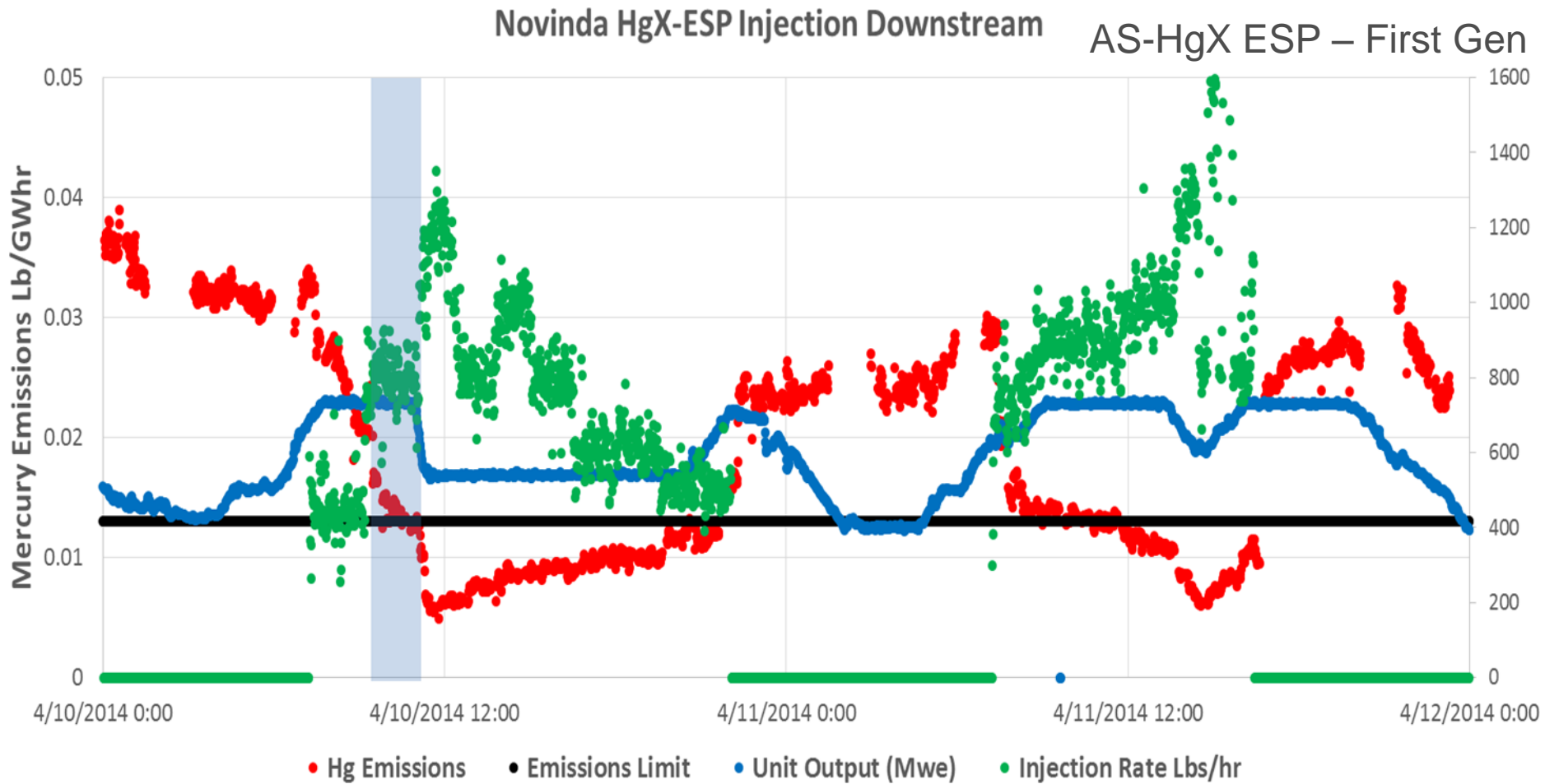
\$12.3M Annual Savings in Operating Costs with Novinda Product

Host Site Schematic



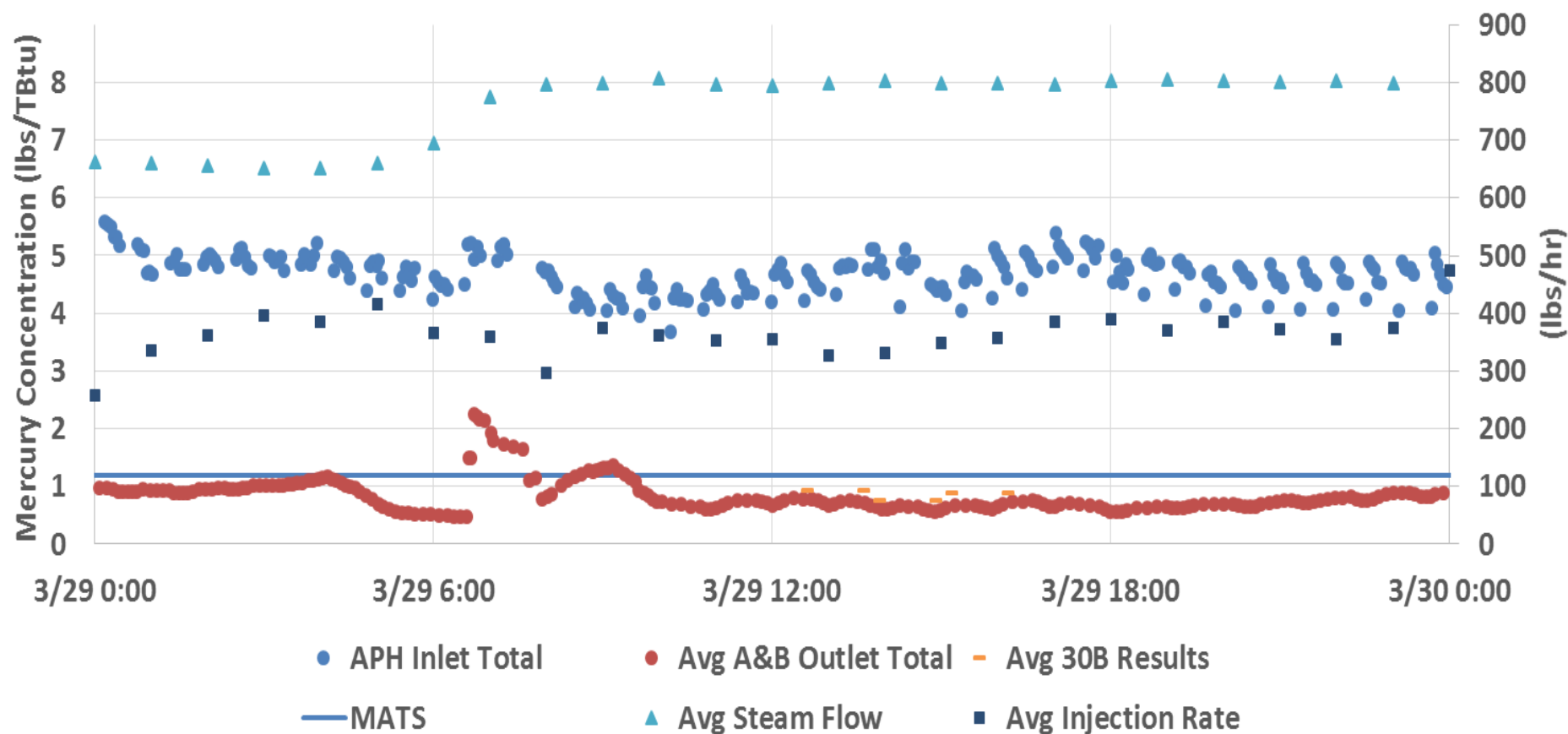
*EPA Method 30B tests were conducted at all CEM locations throughout the trial

Novinda HgX-ESP



125 MW Sub-Bituminous/PRB Blend, CS-ESP Only

March 2014



Econ Outlet Duct Hg Levels 4-5 lb/TBtu