

REINHOLD ENVIRONMENTAL Ltd.



2012 NO_x-Combustion Round Table & Expo Presentation

February 13-14, 2012, in Columbus, OH / Hosted by AEP

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SQUEEZING THE SCR TURNIP

February 14, 2012

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Environmental & Equipment Programs



2012 Reinhold
NO_x-Combustion Round Table



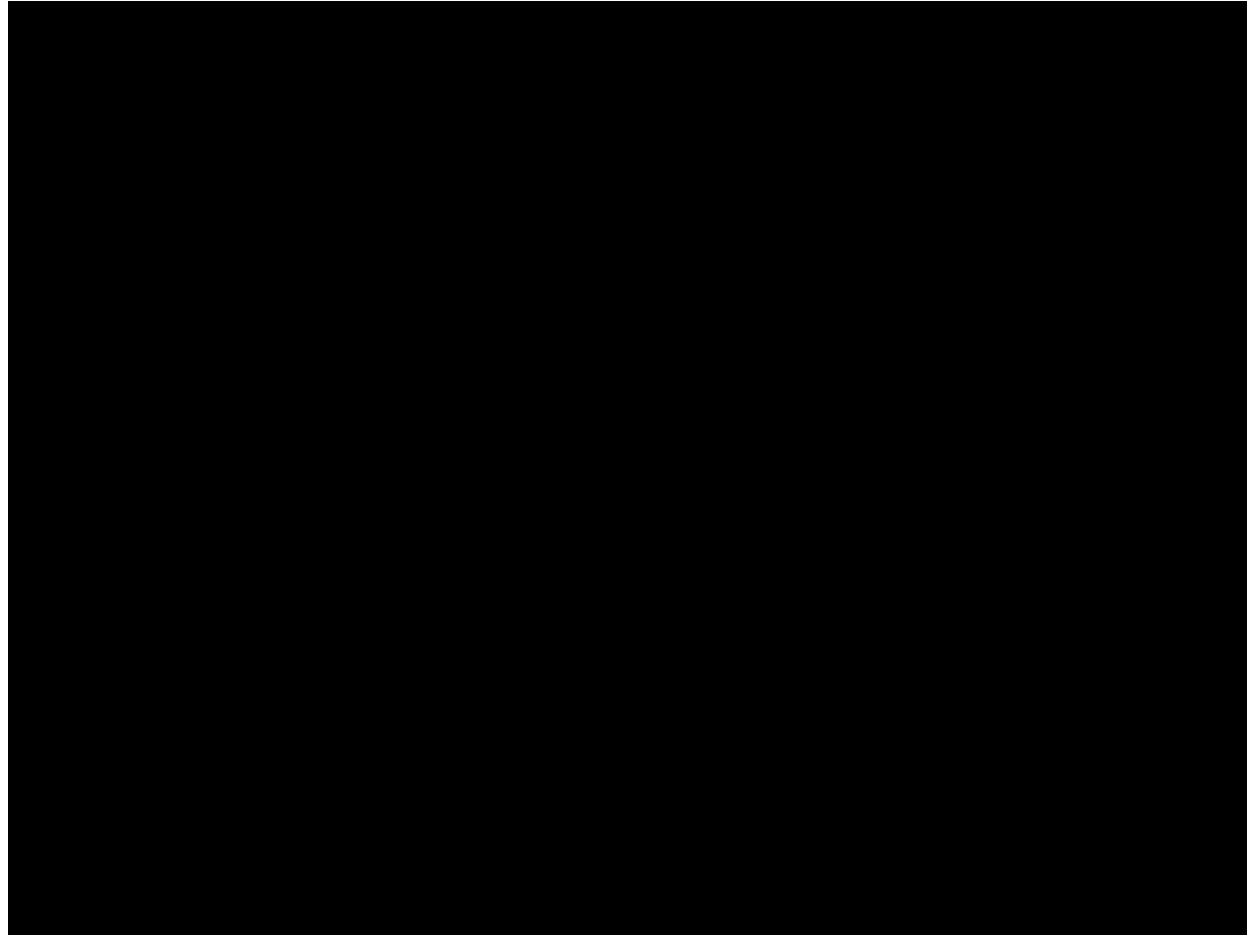
Day 1 Left for 2010 Conference



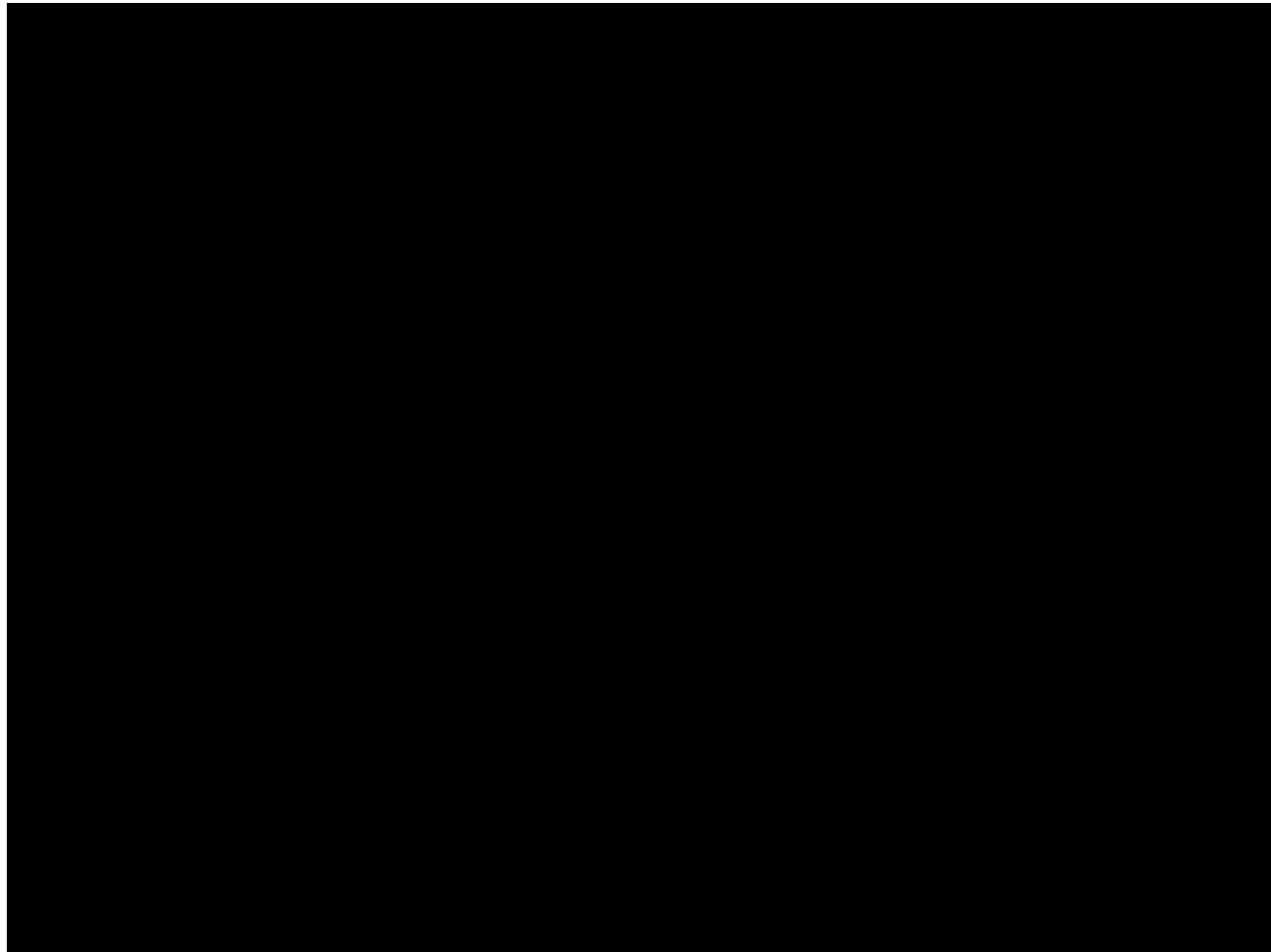
Have you ever squeezed a Turnip



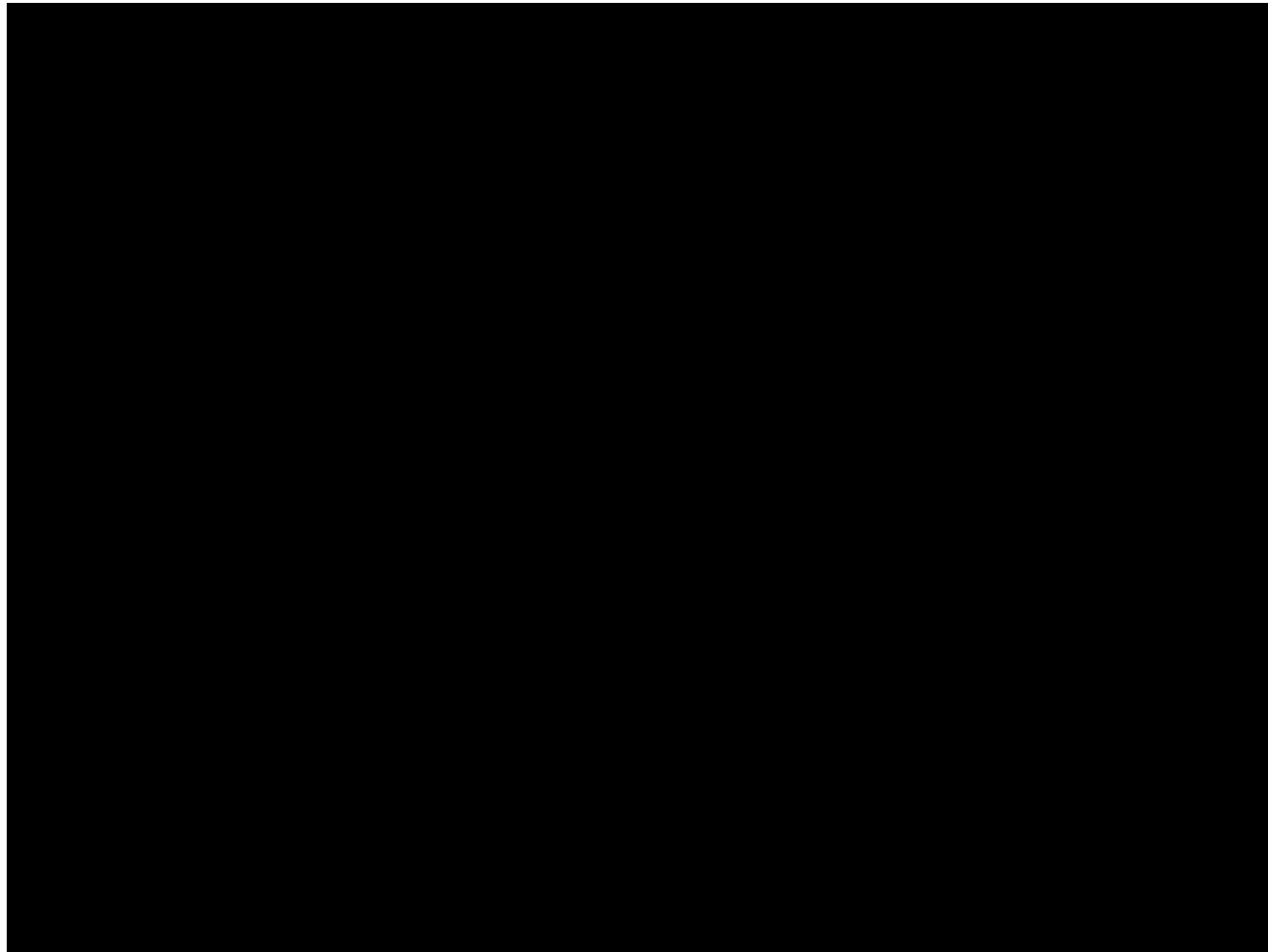
Turnip Squeezing



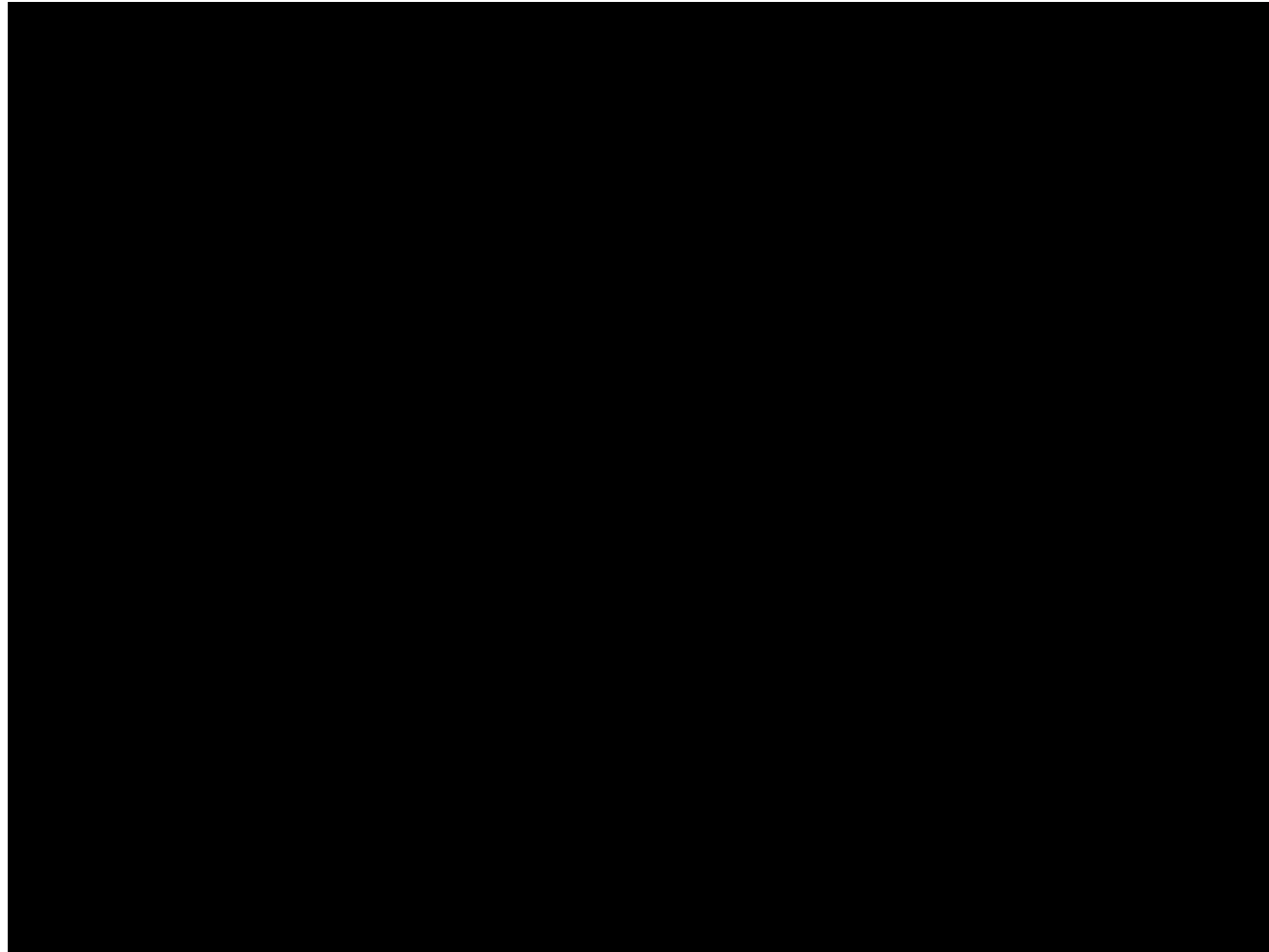
Turnip Squeezing



Turnip Squeezing



Turnip Squeezing



Squeezing the SCR Turnip

Why the title?

Questions last summer and fall.

Regulations?

Be Prepared



Where to start?



Where to start?

G P S

as

rofile

urvey

Operating Characteristics of the SCR

Residual Outlet NO_x Profile

Outlet NO_x Control

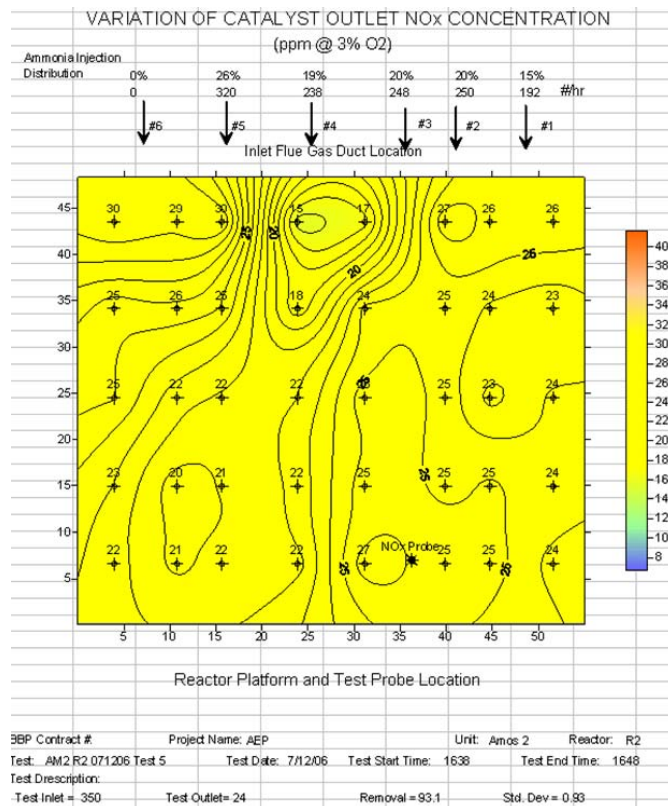
Expected Unit Loading

Duct and AH Arrangement

Available NH₃ Indication and Location

Furnace NO_x

Residual Outlet NOx Profile



Does It Change?

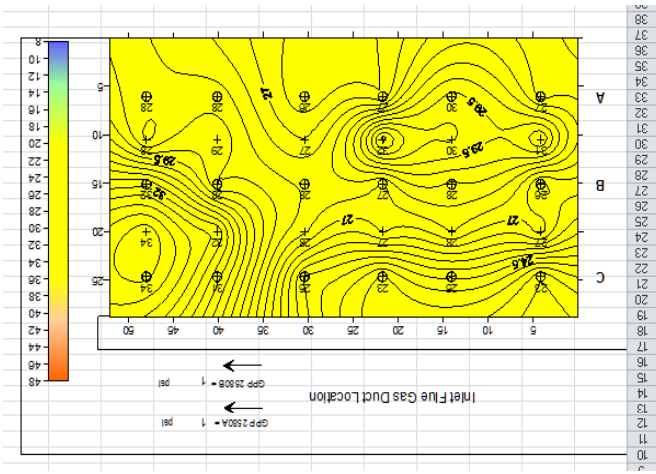
- Load
- Mill Arrangement
- Burner OFA Arrangement
- Unsure CEMS vs Outlet NOx

Knowledge of your profile behavior can be crucial to Squeezing out a little more NOx

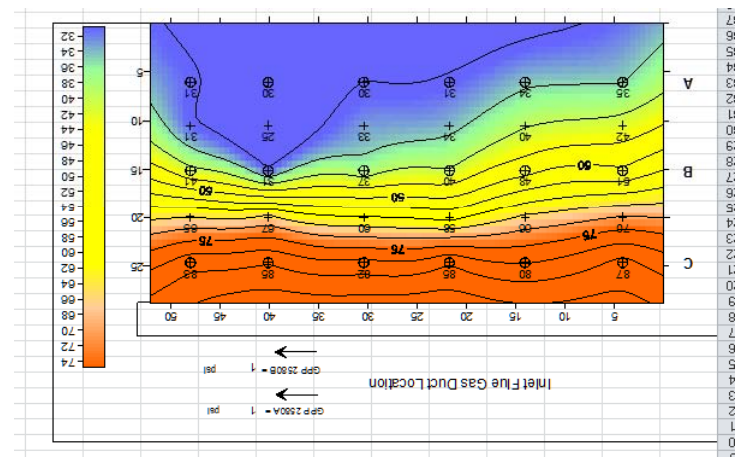
History

Residual Outlet NOx History

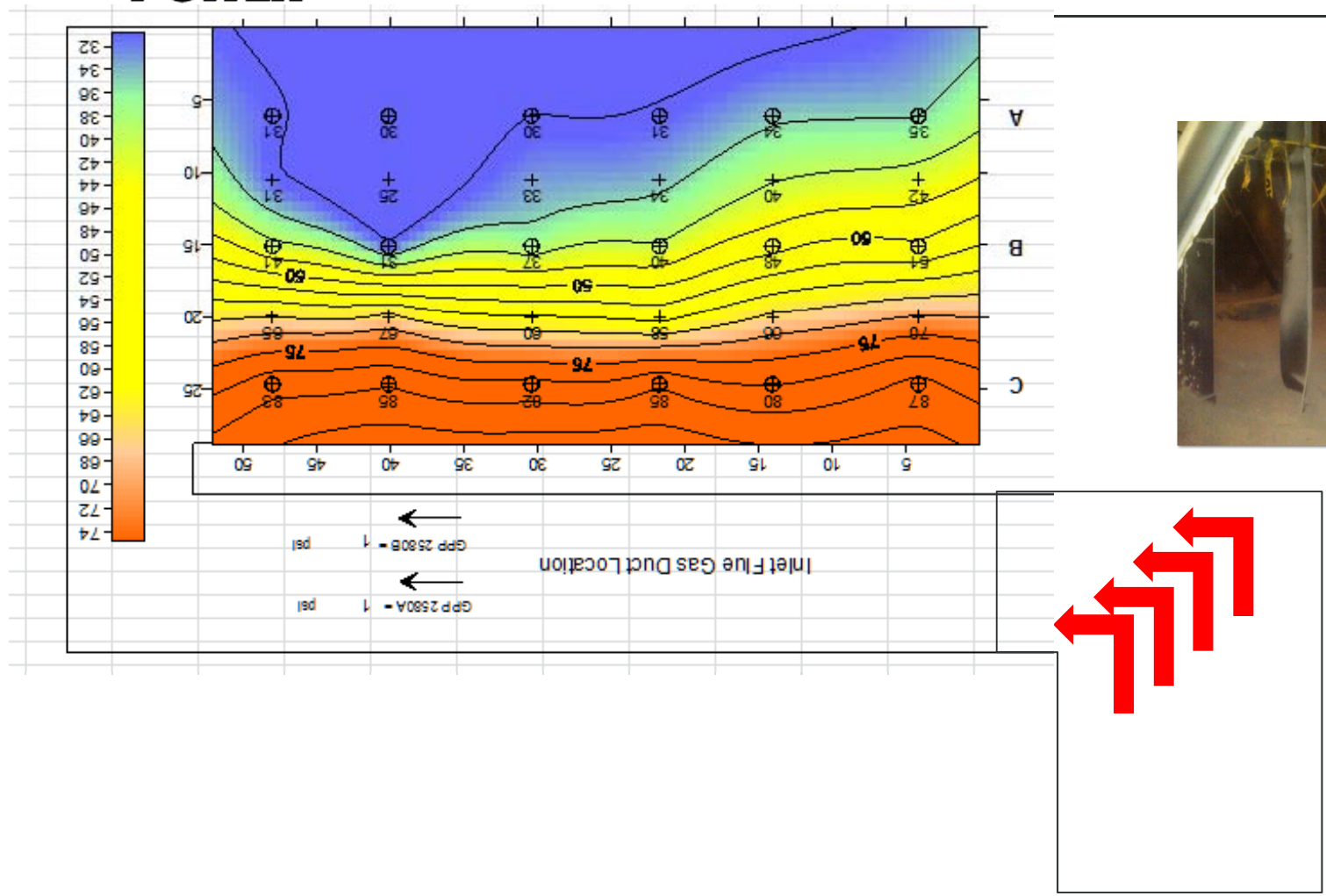
Normal



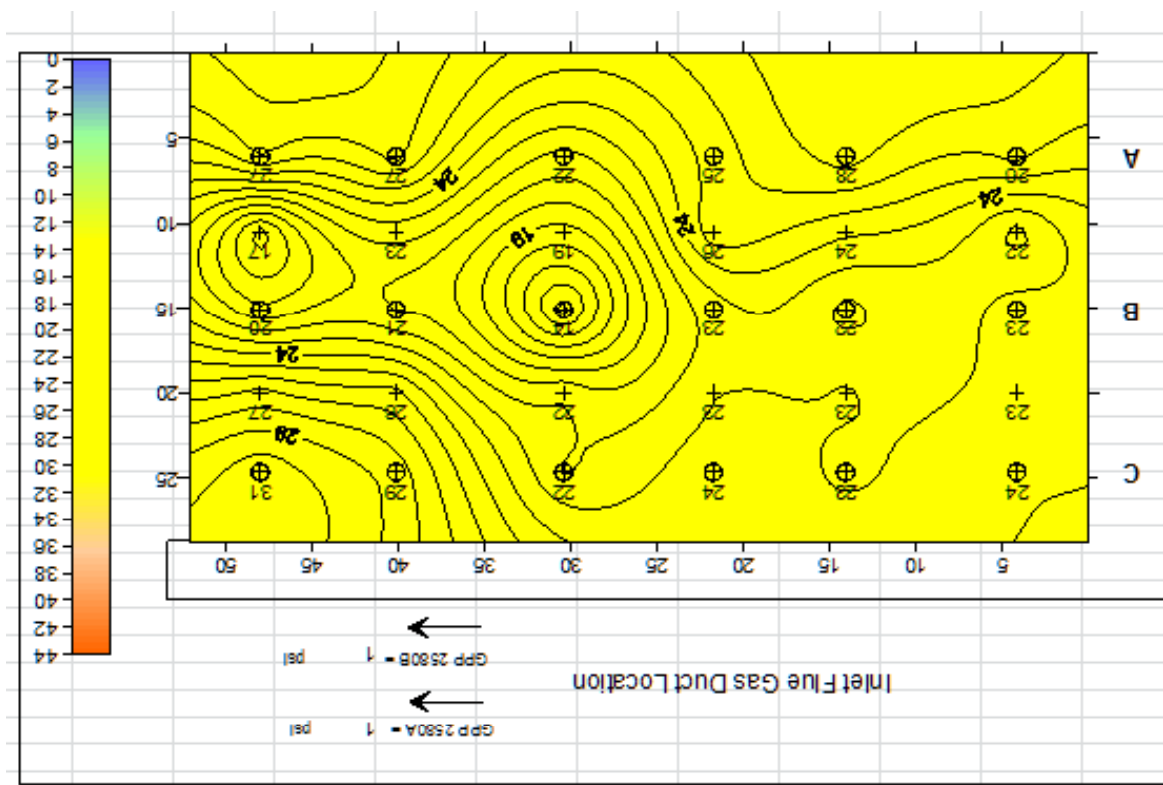
Not



Residual Outlet NOx History



Residual Outlet NOx History



Repairs Made Back to Normal

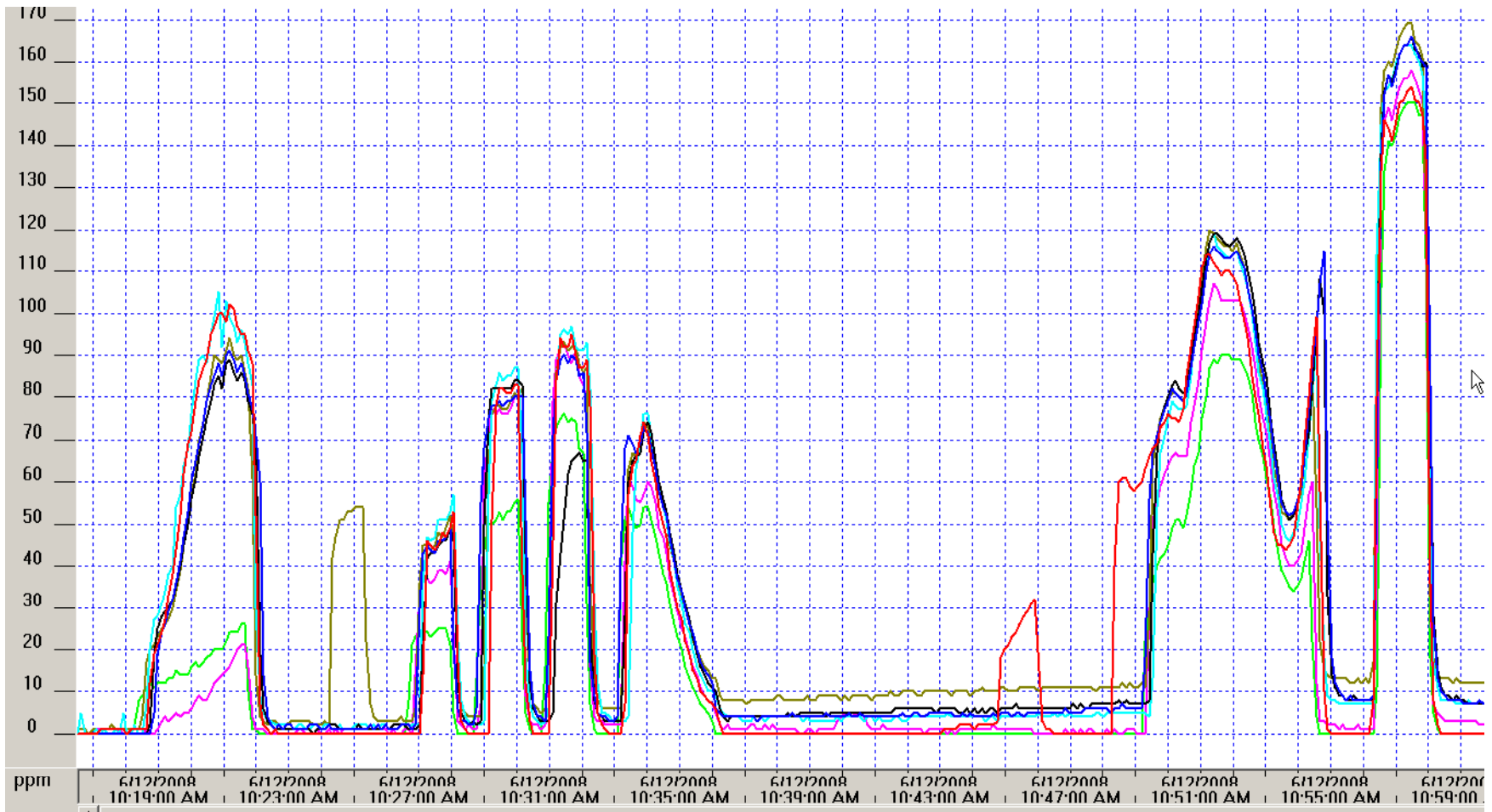


Control / Tuning

How stable are your controls?



NOx Control Example





Control / Tuning

How stable are your controls?

How well are load changes handled?





Expected Unit Loading

Min. operating temperature relief

Min. temperature algorithm



How does the SCR line up with the AH.

Hot side of the AH is generally more resistant to slip

Bypass Damper Leakage Estimate

NOx Bias Examples

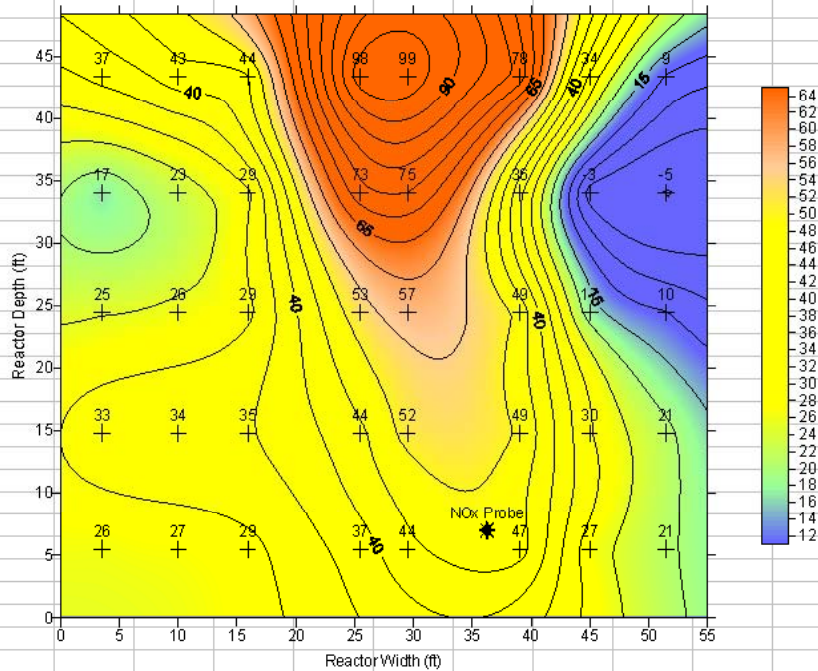
VARIATION OF CATALYST OUTLET NOx CONCENTRATION

(ppm @ 3% O₂)

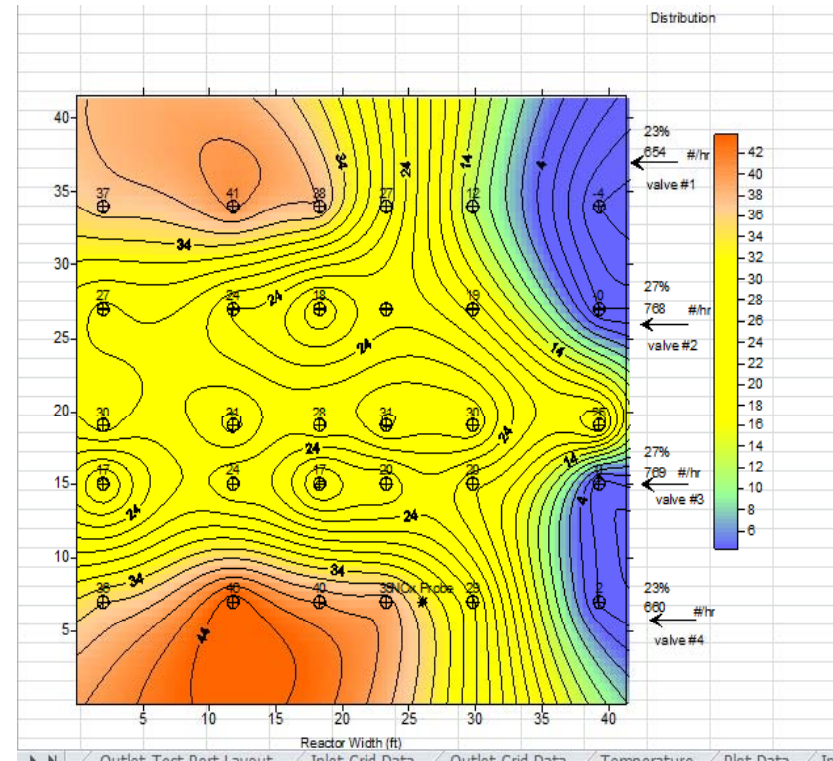
Ammonia Injection Distribution

21% 37% 27% 15%

Inlet Flue Gas Duct Location



Reactor Platform and Test Probe Location



Project Name: AEP Unit: Gavin 2 Reactor: R3

Test: GV2 R3 050708 Test 1 Test Date: 5/7/2008 Test Start Time: 10:47 Test End Time: 10:59

Test Description: As Found After Rough Adjustments

Test Inlet = 541 Test Outlet = 38 Removal = 92.97 Std. Dev = 4.58



Available NH₃ Indication and Location

NH₃ in ash

Slip Monitors



Furnace NOx vs Design

Lower Furnace Lower Outlet

Looking at the GPS for your SCR will help squeeze a little more from you SCR turnip.

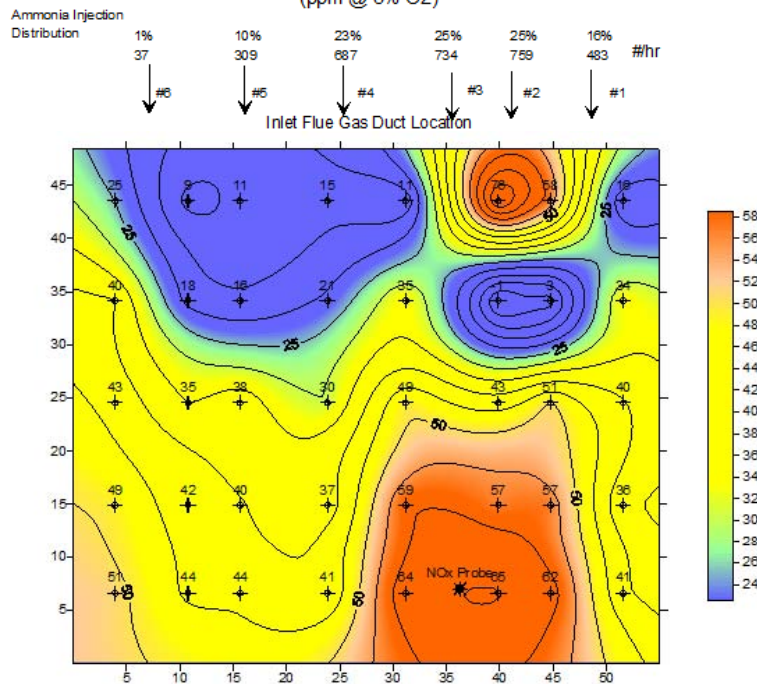
Adding / Changing Catalyst

Additional or Improved Mixing

Mixing Modifications

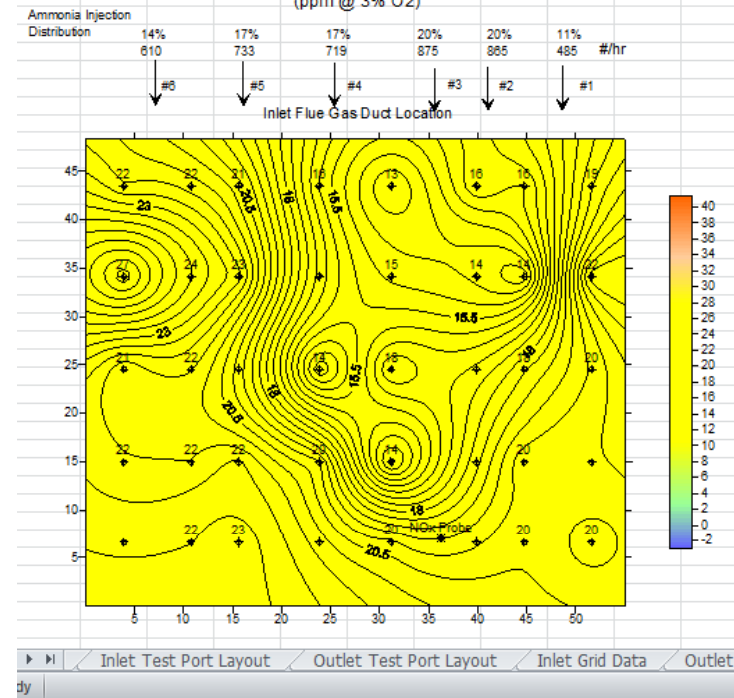
Before

VARIATION OF CATALYST OUTLET NO_x CONCENTRATION (ppm @ 3% O₂)



After

VARIATION OF CATALYST OUTLET NO_x CONCENTRATION (ppm @ 3% O₂)



Adding / Changing Catalyst

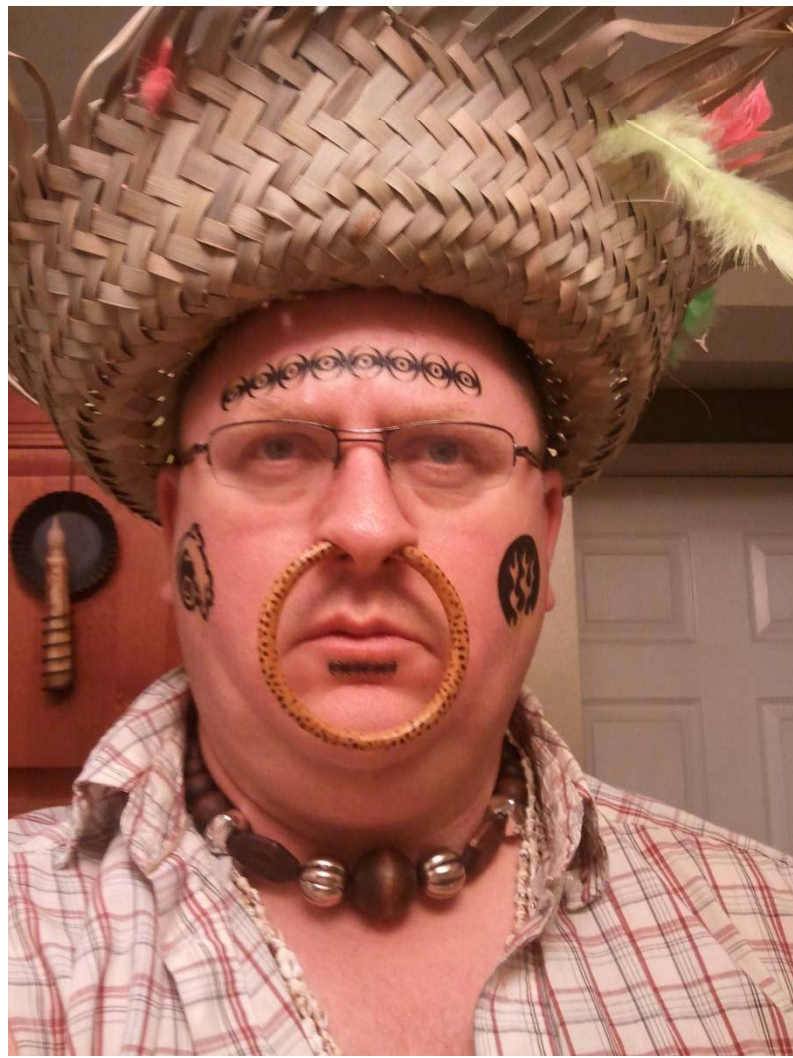
Additional or Improved Mixing

NH₃ Mitigation

Focused AH Heating

Furnace NOx Reduction

LAST RESORT



Develop good Relationship with plant contacts

Favor the field

Relate don't berate

Don't go looking for feathers





Questions?

