

SUNOCO, INC.
CONSENT DECREE
PHILADELPHIA ISSUES

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Philadelphia NOVs

- Include
 - Fires / Process Upsets
 - SRU SO₂ Emissions
 - FCCU Process Rate
 - Benzene NESHAP Carbon Canisters
 - NO_x RACT for a Heater

1232 FCCU

- Install SCR by 6/8/08
 - 20 ppmvd NOx @ 0% O2 on a rolling 365-day avg.
 - 40 ppmvd NOx @ 0% O2 on a rolling 7-day avg.
- Install Wet Gas Scrubber by 6/8/08
 - 25 ppmvd SO2 @ 0% O2 on a rolling 365-day avg.
 - 50 ppmvd SO2 @ 0% O2 on a rolling 7-day avg.

1232 FCCU

- Particulate Matter Limits
 - 1 lb/1000 lbs coke burned with ESP; or
 - 0.5 lbs/1000 lbs coke burned w/o ESP
- Carbon Monoxide Limits
 - 500 ppmvd @ 0% O₂ on a 1-hour avg.
 - Also 100 ppmvd @ 0% O₂ on a rolling 365-day avg. for 868 FCCU

Heaters and Boilers

- NOx Emission Reductions Program
 - Units greater than 40 MMBTU/hr.
 - Install controls and accept NOx emission limits or shut down units
 - Must have total NOx reductions of at least 2,189 tons/yr.
 - NOx CEMS or PEMS required for larger units

Heaters and Boilers

- SO₂ Emission Reduction Program
 - Must comply with NSPS Subpart J for fuel gas combustion
 - Some fuel oil combustion phase out

Other Items

- NSPS Applicability
 - FCCU Regenerators
 - Sulfur Recovery Plant
 - Flares
- Benzene Waste NESHAP Enhancements
 - Install secondary carbon canisters
- Enhanced LDAR Program

Permitting – General Issues

- In addition to regulations, must check CD for requirements (pre-construction and operating permits)
 - Emission Limits
 - Definitions
 - Other Requirements (CEMS, NSPS, etc.)
- Increased number of permits
- Increased number of stack tests and CEMs

Permitting – 1232 FCCU

- Installed SCR and Wet Gas Scrubber
- Increased capacity
 - Did not trigger NSR/PSD for NO_x or SO₂ due to SCR and WGS
 - CD allowed credits for 15% of NO_x and 10% of SO₂ reductions
 - Triggered PSD for CO, PM₁₀ & H₂SO₄
 - Existing CO Boiler BACT for CO
 - WGS BACT for PM₁₀ and H₂SO₄

Permitting – 1232 FCCU

- Emission Limits

- POLLUTANTS

CONCENTRATION AND EMISSIONS PER COKE BURN-OFF

LONG TERM

SHORT TERM

- Filterable PM/PM₁₀ **0.30 lb/1000 lb coke burn-off, 365-day roll avg**
- **0.50 lb/1000 lb coke burn-off, 3-run avg**
- Total PM₁₀ **0.014 gr/dscf @ 3% O₂, 3-run avg**
- SO₂ (when CO boiler burns fuel gas with H₂S>0.1 gr/dscf) **20 ppmdv @ 0% O₂, 3-hr Roll avg**
- SO₂ **25 ppmdv⁵ @ 0% O₂, 365-day roll avg** **50 ppmdv @ 0% O₂, 7-day roll avg**
- CO **100 ppmdv⁵ @ 0% O₂, 365-day roll avg** **500 ppmdv @ 0% O₂, 1-hour avg**
- NO_x **20 ppmdv @ 0% O₂, 365-day roll avg** **40 ppmdv @ 0% O₂, 7-day roll avg**

Permitting – 1232 FCCU

- Also pounds/hour, pounds/day, and tons/year emission limits
 - Include VOC, H₂SO₄, and NH₃
- CO Boiler must comply with NSPS Subpart J
- Fugitives must comply with NSPS Subpart GGG and MACT Subpart CC
- Existing NO_x, SO₂, and CO CEMS
- New PM CEMS

Permitting – Heater Example

- Replaced #6 oil burners with ULNBs burning RFG and natural gas
- NOx emission limit: 0.060 lbs/MMBTU HHV
 - Must be designed to achieve 0.040 lbs/MMBTU HHV at full load to be eligible for NOx reductions (Current Generation ULNB)
 - Only get credit for reductions to emission limit
- Must comply with NSPS Subpart J by 12/31/10

Compliance & Enforcement

- CD Compliance Tools
 - Help Sheet
 - Requirements
 - Penalties
 - Checklist
 - Deadline/Requirement
 - Verification