



# Ethanol Plant Issues

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# Overview



- ☀ **Global Settlements**
- ☀ **Industry Growth**
- ☀ **Current Compliance Trends**
- ☀ **Other Recent Issues**
  - EPA proposal to change PSD thresholds
  - Co-located facilities
  - Phosphorus
  - Switch from Gas to Coal
  - HAPs

# Global Settlements – ADM (8/03)

## ✦ 52 plants in 16 states

- 61,000 tons emissions reduction
  - RTOs or flares on dryers, fermenters, carbon furnaces and loadout
  - SNCR & ultra-low NOx burners
  - Scrubbers & lime injection for SOx control
  - Shut down dirtiest units
  - Install CEMS
  - Environmental Audits on all facilities
  - Implement an Environmental Management System
- \$213 million capital improvements
- \$4.6 million civil penalties
- \$6.3 million in SEPs (diesel retrofits, wetlands, etc.)
  - \$50,000 to MEEA for enforcement training

# Global Settlements - ADM

## ✦ Status / Issues

- Installation & Implementation phase
- Tracking compliance with Settlement huge issue
  - Not heard from EPA contractor in over a year
- Permitting Issues
  - PSD 'clean up' permit
    - Incorporate settlement elements
    - Increment non-compliance
    - Simultaneous with expansion (coal boiler)
  - Initial OP soon to follow

# Global Settlements- Cargill (9/05)

- ✿ 27 plants in 13 states
  - 30,000+ tons pollution reduction
  - Essentially similar controls as ADM
    - System-wide SO<sub>2</sub> cap for 16 coal-fired boilers in 7 states
    - No audit & EMS features
  - \$60 million capital improvements
  - \$1.6 million civil penalties
  - \$3.5 million in SEPs (diesel retrofits, wetlands, etc..)

# Global Settlements- Cargill (9/05)

## ✶ Status / Issues

- Tracking compliance
  - Single national contact?
  - Individual States responsibility?
  - How do we know if comply with system-wide limits?
- VOC methodology left unresolved
  - Determination of total mass of VOC at issue
  - Control efficiency at many points
  - Method 25A at few points
  - Many emission units left un-tested (NE contested case)
- OP on hold since 1/04



# Ethanol Industry Growth

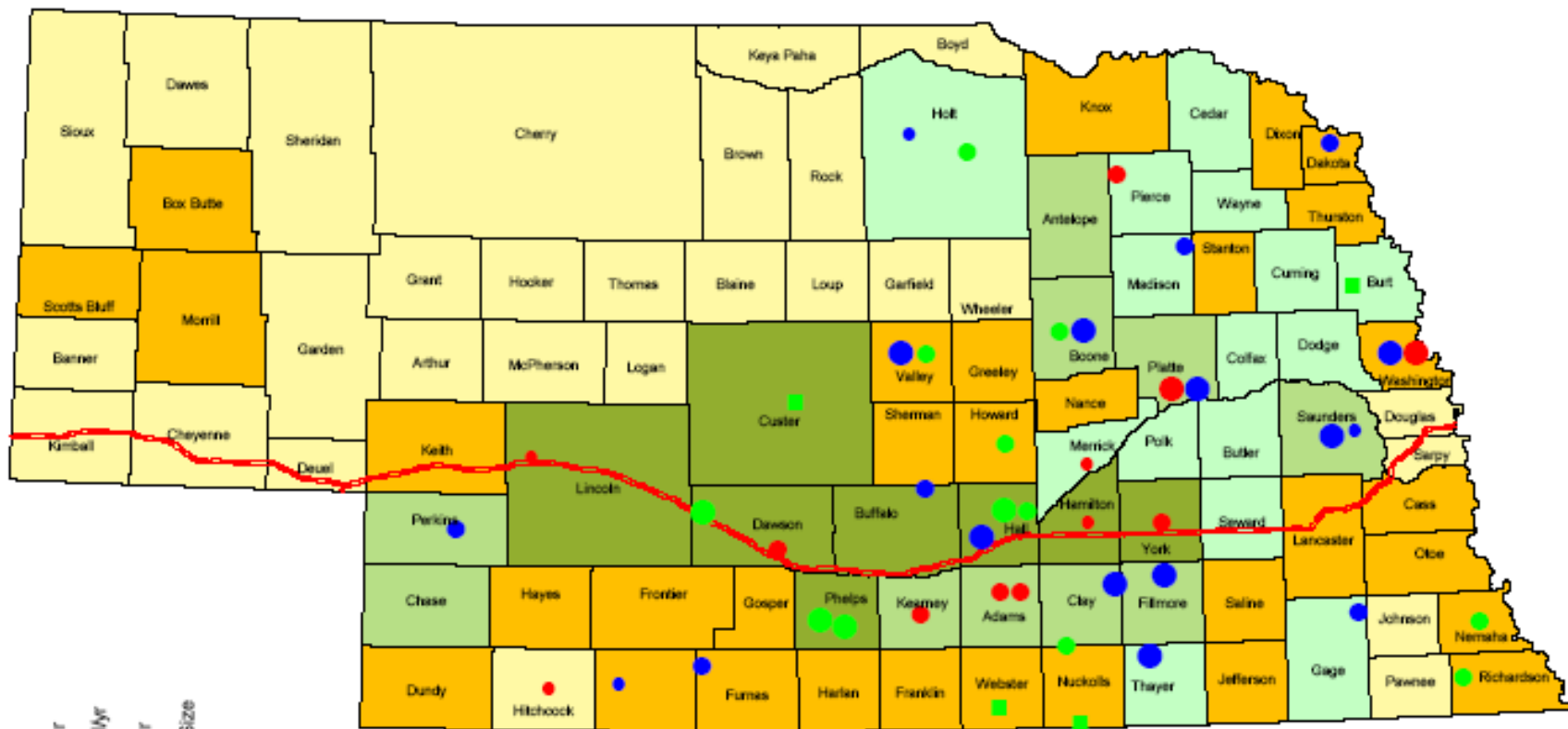
*We Need Your Support for Domestic Renewables*



- ☀️ **National renewable fuels mandate**
  - 7,500 MGY by 2012
- ☀️ **EtOH made in 19 states (planned in 2 others)**
  - 4,486 MGY current; 2,230 MGY under construction
- ☀️ **Nebraska growth**
  - Currently, 3<sup>rd</sup> largest producer (IA – 1<sup>st</sup>; IL – 2<sup>nd</sup>)
  - Operational permitted capacity – 723 MGY
  - Capacity under construction or being permitted – 1905 MGY
  - Planned capacity, no application as of 5/22/06 ~ 1,500 MGY

# Planned, Proposed, and Operating Ethanol Plants in Nebraska

As of April 2006



< 50 Mgal/yr  
 50-99 Mgal/yr  
 > 99 Mgal/yr  
 Unknown Size  
 Existing/Operating Ethanol Plants  
 Ethanol Plants Under Construction and/or being Permitted  
 Planned Ethanol Plants  
 Interstate

**Nebraska Corn Production**  
 (per thousand bushels)  
 0 - 7000  
 7000 - 14000  
 14000 - 21000  
 21000 - 28000  
 28000 - 35000

Source: Nebraska Agricultural Statistics Service,  
 Nebraska Agricultural Statistics 2001-2002,  
 Updated August 2002





# Current Compliance Trends

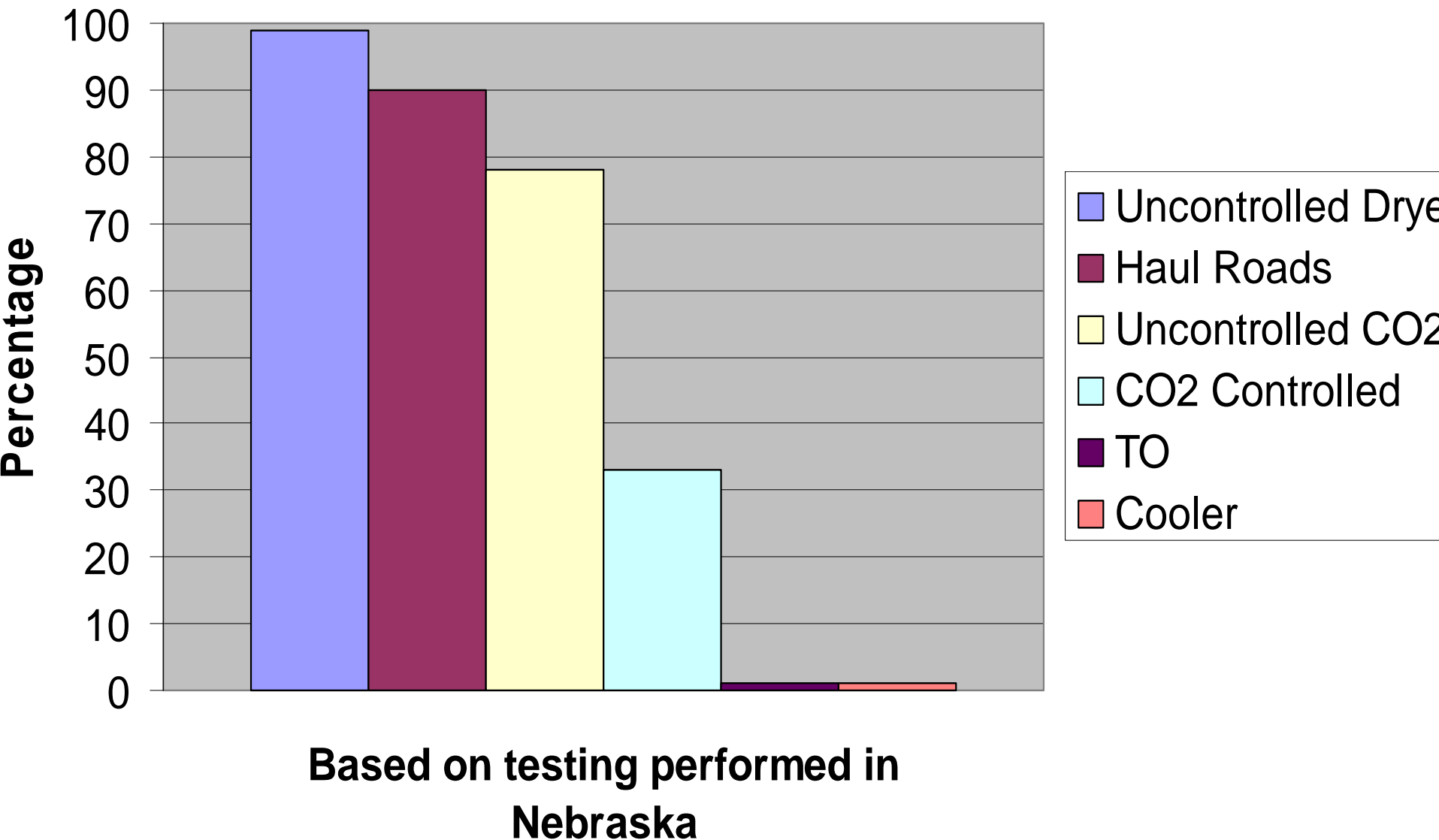
- ☀ VOCs, HAPs, PM
- ☀ PM – Dirty haul roads
- ☀ Fermentation Scrubbers – Frequent malfunctions
  - Fan vibrations; packing materials; pH
  - Difficulty meeting HAP control efficiency
    - Sodium bisulfide additive helps
- ☀ Thermal Oxidation (dryers & loadout)
  - Meets VOC & HAP control requirements
  - One plant having retrofitting problem
- ☀ Failure to complete stack tests on time
- ☀ Construction of additional units w/o permit

# Current Compliance Trends

## ⚠️ Other consistent compliance issues

- Failure to meet emission limits
- Failure to track emissions monthly
- Failure to document corrective actions
- Failure to report control equipment malfunctions

# Percent that Ethanol plants might exceed permit limits at these emission points



# Other Recent Issues

## ✦ EPA Proposal to Change PSD applicability – March 2006

- Raise permit threshold from 100 to 250 tpy
- Many fugitives would not be counted toward applicability
- Consistent with beverage-grade ethanol
- Stimulate growth in industry
- Reference only to corn-based ethanol
- ?? Timeline for EPA decision



# Other Recent Issues

## ❁ Co-location concerns

- Animal feeding operation example in Nebraska
  - Waste from anaerobic digestion used for fuel at ethanol plant
  - Distillers grains (DGS) from ethanol plant fed to cattle
  - Separate sources because maintained fuel & feed independence



# Other Recent Issues

## ✦ Co-location concerns

- Grain Elevators
  - Existing elevator / new ethanol plant
    - Grain handling capability of ethanol plant?
    - Is it a support facility?
  - Support Facility Issues
    - Certification of Compliance & Deviation reporting
    - Emission Inventory reporting
    - Sharing of information
  - Non-Support Facility Issues
    - Maintaining separateness

# Other Recent Issues



## ☀ Phosphorus

- DGS used as feed supplement (up to 30%)
- Phosphorus in DGS accumulates in animal waste
  - Limits beneficial use of animal waste when land-applied as soil supplement
  - Some research planned on ways to remove phosphorus content in DGS

## ☀ Switch from gas to coal

- 3 existing plants in NE switching from gas to coal; 1 new plant planning coal; 1 existing uses sub-bituminous coal
- 2 of 4 new coal boilers plan to use sub-bituminous & bituminous coal, tires, & pet coke
- Similar plans in other states

# Other Recent Issues

## ✦ Hazardous Air Pollutants

- Coal-fired boilers likely major ---- HCl
- If major, expect the MON will apply
  - 98% or 20 ppm from process vents
- Fermentation & Distillation
  - Non-majors have difficulty meeting 65% control with scrubbers
  - Thermal Oxidation
    - Oversize to account for CO<sub>2</sub> emissions
    - CO<sub>2</sub> market saturated



# Questions?

