Landscape

- Animals being concentrated
- Public air quality complaints abundant
- Lawsuits increasing against farms
- CAA applicability confusing
- Political fallout likely for either inaction or heavy-handed control
Agreement Overview

• EPA & USDA asked National Academy of Science (NAS) to conduct the AFO air emissions study
• NAS study conclusions:
  – No reliable emission factors for AFO exist
  – Additional data needed to develop estimating methodologies
  – Current methods for estimating emissions not appropriate
  – Use process-based approach
• Consent agreement developed in response to:
  – Public concerns
  – NAS report
• Consent agreement developed by:
  – EPA
  – Industry representatives
• Agreement coordinated with:
  – Agricultural industry representatives
  – State & local government officials
  – Environmental organizations
  – Citizen groups
Agreement Overview (cont)

• What is the Agreement? Voluntary consent agreement open to contract growers and integrators. Industry agrees to pay to conduct emissions testing. Targeted AFO sectors:
  – Swine
  – Poultry
    • Layers
    • Broilers
    • Turkey
  – Dairy

• Federal Register Notices:
  – Signed on Jan. 21, 2005
  – Published on Jan. 31, 2005 (70 FR 4958)
  – “Initial” public comment period closed on March 2, 2005
  – Re-opening comment period from April 1 through May 2, 2005
  – Extending signup period to July 1, 2005
Monitoring Study - Signups

- EPA received approximately 2,700 agreements representing over 13,000 farms.

Number of Farms Represented in AFO Consent Agreement

- Dairies, 4% of all Farms
- Swine, 42% of all Farms
- Broilers, 35% of all Farms
- Layers, 19% of all Farms

Map showing the distribution of farms by state, with different colors indicating the number of farms in each category.
Monitoring Study - Overview

• Purpose: gather data for developing emission estimating methodologies
• Funding provided by participating AFOs - $14.8M
• Monitor for:
  – Particulate matter
  – Hydrogen sulfide
  – Volatile organic compounds
  – Ammonia
• Data made available to the public
Monitoring Study – Site Selection

- Focuses on three AFO sectors
  - Swine
  - Poultry
  - Dairy
- Types of operations
  - Sow, nursery, finisher (swine)
  - layers, broilers
  - Dairy
- Manure Management Techniques
  - Liquid system
  - Solid system
- Regional representation
- Proximity to principal investigators
National Air Emissions Monitoring Study

- States with monitoring sites (Number of sites by animal type).
Monitoring Study – Work Plan Development

• EPA approved the monitoring plan & sites:
  – On November 29, 2006
  – Plan included:
    – Quality Assurance Project Plans (1 each for lagoons and barns)
    – Standard Operating Procedures (76 unique SOP’s)
  – 24 monitoring sites approved
Monitoring Study – The Challenges

- Changing Climatic Conditions
- Partially Enclosed and Naturally Ventilated
- Animal Movements
- Large Open Sources
- Changing Feed Rations
Monitoring Study – Overcoming The Challenges

• Changing Climatic Conditions
  – Regional Representation
  – Continuous Monitoring
  – Heated Sampling Lines

• Partially Enclosed and Naturally Ventilated Structures
  – Numerous Emission Sampling Points
  – Multiple meteorological sampling points
  – Monitor Mostly Mechanically Ventilated Buildings

• Large Open Sources
  – Use Open-Path Measurement Techniques ($$$)
  – Monitor on a quarterly basis to keep cost down

• Changing Feed Rations
  – Sample Feed
  – Continuous Monitoring

• Animal Movements
  – Attempt to track animals electronically
  – Continuous Monitoring
Approach to Naturally Ventilated & Partially Enclosed

- Barn 1 (103 ft x 615 ft)
- Barn 2 (103 ft x 615 ft)
- Exercise lots between barns
- Gas sampling location group
- Ultrasonic anemometer
- PM2.5, gravimetric
- PM10, continuous
- Thermocouple
- RH/Temp probe
- Air sampling
- Solar sensor
- Wind sensor
- Instrument shelter
- Heated raceway

Instrument shelter

Heated raceway

Gas sampling location group

Exercise lots between barns

Barn 2 (103 ft x 615 ft)

Barn 1 (103 ft x 615 ft)
Approach for Large Open Sources
Approach for Large Open Sources

Open-Path FTIR Concept
What’s Next?

• Data Collection Complete

• Complete data analysis and publish Emission Estimating Methodologies – 18 months after completion of data collection

• Participants must comply with any applicable requirements – 120 days after publication of Emission Estimating Methodology
Goals for Next 2-3 Years

• Settle issues of CAA requirements
  – Emission estimation (e.g., emission factors, potential to emit)
  – Source definition
  – Applicability cutoff (i.e., size cutoff)
  – Fugitive/non-fugitive
  – Control technology effectiveness
  – Monitoring, reporting and recordkeeping
Thanks.
Questions?