



# Case Development: Tools and Techniques





# Case Development

- Targeting
- Information Gathering
- Emissions Calculations



# Purpose

- Identify tools and techniques that can be used in NSR Case development and permitting:
  - Targeting: Understanding trends in the industry and specific processes more completely
  - Information Gathering: Identifying the full scope, effect and purpose of the project being permitted
  - Emissions Calculations: Questioning and checking baseline actual and projected actual emissions



# Targeting Importance

- Targeting is important for enforcement because focusing on a sector and conducting in-depth investigations are time consuming commitments
- Limited resources within EPA require that we use our time most effectively and target inspections where violations are more likely



# Premise

- Industries that have grown are more likely to have triggered CAA requirements than those industries that have not grown
  - NSR
  - NSPS
  - MACT
- NSR permitting is sometimes scant in industries where there has been significant growth



# Emissions are often related to production

- Increased production often causes increased emissions from existing facilities and sources
  - Unless contemporaneous or concurrent emissions reductions are accomplished
- Increased production is normally achieved by construction of new facilities and sources or modification of existing facilities and sources



## Increased production capacity indicates physical construction

- Increased production of existing lines
- New production lines

# Link between CAA Requirements and Physical Construction

- Physical construction generally involves “a physical change” that may trigger new requirements of NSR or NSPS





# Systematic Targeting of Industry Sectors

- Choose a high emitting sector
  - National Emission Inventories and TRI to identify can indicate a sector that is a high emitter nationally or for your region
  - Utilities, Petroleum Refineries, Pulp & Paper, Cement and Glass are all significant emitters of SO<sub>2</sub> and NO<sub>x</sub> in the NEI



# Systematic Targeting of Industry Sectors

- Identify a Sector with increases in capacity without corresponding permitting
  - Information on industry production capacity is publicly available
  - Research permit activity for the industry



# Systematic Targeting of Industry Sectors

- Have a Case Theory and Test it
  - FCCU capacity expansion through increases in air blower capacity results in increased emissions of SO<sub>2</sub>, NO<sub>x</sub> and PM
  - Reclaiming lost capacity on a utility boiler results in increased emissions of SO<sub>2</sub>, NO<sub>x</sub>, and PM
  - Increase in pulping capacity results in increase SO<sub>2</sub> from NCG incineration
  - Physical changes necessary to burn petroleum coke in cement kilns have resulted in increased emissions of SO<sub>2</sub>
  - Installing electric boost on glass furnaces can increase PM emissions



# Systematic Targeting of Industry Sectors

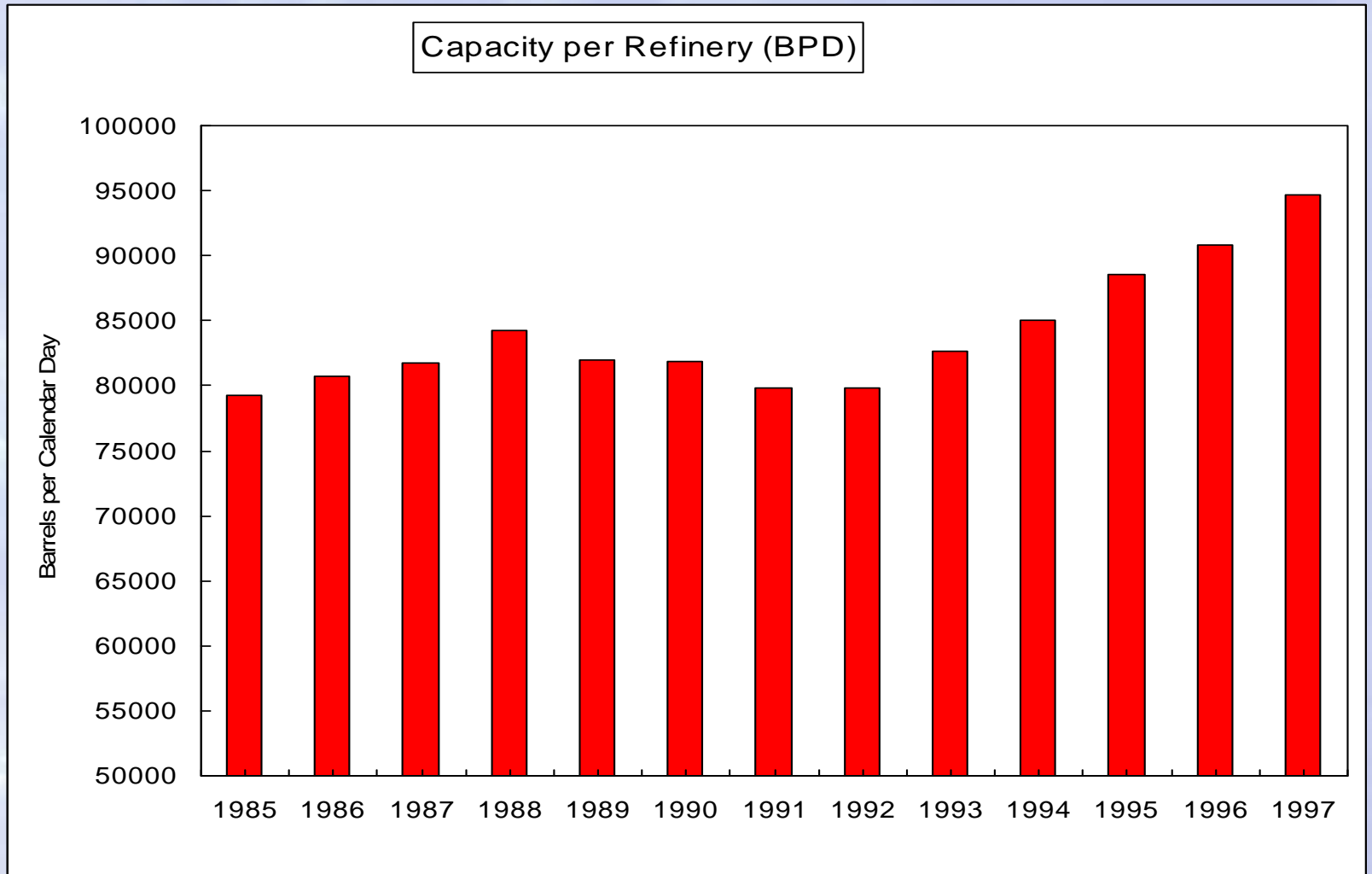
- Keep the End Game in Mind
  - What benefits will result from application of injunctive relief?
  - Common existing controls in industry vs. availability of more effective controls
    - Do most sources avoid application of BACT/LAER by netting out or by questionable BACT/LAER determinations?
    - Is NSPS widely avoided in industry?



# Examine Data over Time

- Identify an industry that has expanded significantly
- Gather data on capacity or production changes over time
- Plot data to highlight trends visually
- Read supporting information on forecasts of trends for the industry

# U.S. Refining Capacity per Refinery





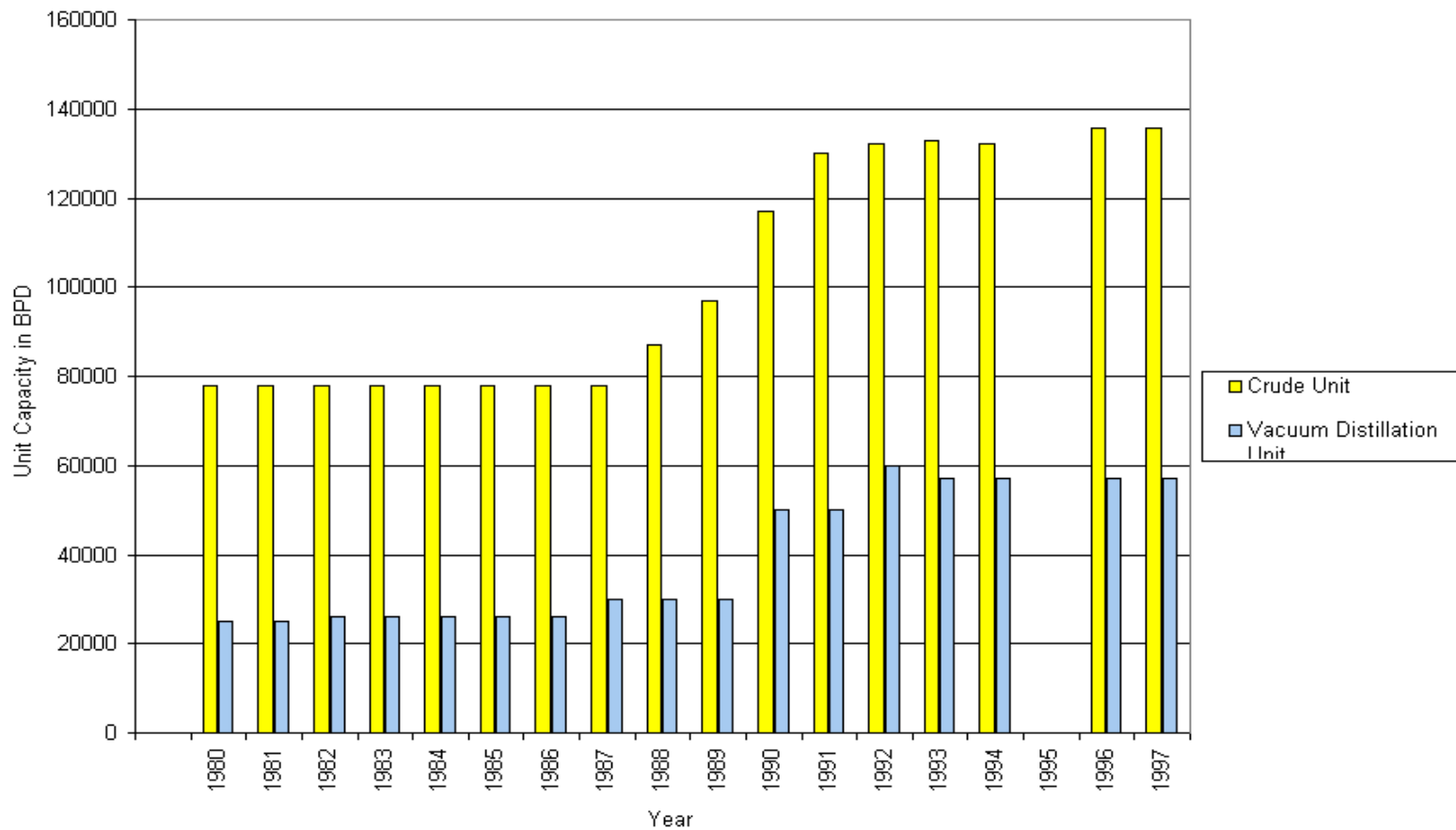
# Systematic Targeting of Specific Facilities

- Use research to identify facilities that have expanded production capacity significantly without obtaining PSD or NSR permits
- Look for facility capacity data over time, summaries of construction projects at particular facilities, and compare



# Crude Unit Capacity

Texaco - Anacortes, WA





# Other Clues for Targeting

- Look for companies that have had similar problems/violations in several facilities
- Look for companies that have had similar problems/violations in different parts of the country
- Look for similar changes among several companies in an industry sector
  - Process improvements that spread through industry that increase emissions (e.g., Ladle Metallurgy Station on an Electric Arc Furnace)
  - Cost savings measures that are adopted by the industry as a whole that increase emissions



# Research Resources

- Industry journals
- Industry directories



# Research Resources (continued)

- EPA databases showing changes over time in pollutant emissions, discharges, releases
  - AFS - Airs Facility Subsystem
  - NEI - National Emission Inventory
  - TRIS - Toxic Release Inventory System
  - PCS - Permit Compliance System



# Research Resources (continued)

- Internet
  - Facility and corporate home pages
    - [www.name.com](http://www.name.com)
    - annual reports
    - facility and corporate news
  - Industry publishers
    - [www.pulp-paper.com](http://www.pulp-paper.com)
    - [www.chemicalweek.com](http://www.chemicalweek.com)
    - use to identify other sources of information



# Research Resources (continued)

- Lexis/Nexis™ for facility information
- Contacts in states
  - inspectors
  - permit writers
  - enforcement personnel



# Information Gathering

- File Review
- Facility Inspection
- Information Requests



# File Review

- Permit Applications and Correspondence
- Engineering Evaluations
- BACT Analyses
- Minor and Major NSR Permits
- Emission Inventories
- Inspection Reports



# File Review

- Just as important for permitting to understand the facility history as it is when conducting an NSR investigation
  - Relationship between separate permit applications (are they one project permitted separately?)
  - Relaxation of synthetic minor permit limit might trigger 52.21(r) and will not be known unless origin of limit is known



# Facility Inspection

- Interviews
- Physical evidence
- Records



# Facility Inspection: Interviews

- Talk to Engineer responsible for process
  - detailed description of process
    - reference process flow diagrams
  - Focus on changes in operations or equipment
    - reference Authorizations for Expenditure and engineering studies
- Talk to Operators



# Facility Inspection: Physical Evidence

- Physical signs of new construction
- Changes in control equipment or technology
- Photographs (Google Maps)
- Samples and monitoring



# Facility Inspection: Facility Records

- Records that indicate modifications
  - Authorizations for Expenditure
  - Engineering Studies
  - Turnaround Reports
  - Capital Forecasts and other planning documents



# Facility Inspection: Facility Records *(continued)*

- Production records
- Records of raw materials usage/supplier
- Records of process parameters
- Control equipment O&M logs
- Operator logs
- Calculation of actual emissions
- Results of stack tests and test methods
- CEMS Data



# Meeting in Lieu of Onsite Inspection

- Understanding the process is key to proper permitting
- In lieu of an onsite inspection (sometimes difficult due to travel budget limitations), the permitter may ask that the company come in and provide a presentation explaining how the processes work



# Information Requests (CAA Section 114)

*Ask for:*

- Generally, evidence for changes that may have increased production capacity
- Information needed to calculate emissions independently
- Permit history



# Information Requests: Capacity Increase Evidence

- Documents
  - Authorizations for Expenditure
  - Engineering Studies
  - Turnaround Reports
- Data over time
  - Feed/Production – plot it
  - Fuel Usage – plot it



# Information Requests: Emissions Calculations

- Feed/Production/Fuel usage over time
- CEMS data over time
- All Stack Tests for Unit in Question
- Annual Emission Statements
- Calculations of projected actual emissions
- Require testing (if necessary)



# Information Requests: Permit History

- All permit applications and supporting correspondence
- Engineering or permit review memoranda
- All permits
  - Minor NSR
  - Major NSR
  - Title V



# Emissions Calculations

- Explain the various sources of data available for use in emissions calculations
  - A Data Quality List



# Data Quality Hierarchy

1. CEMs data from emission point(s) in question
2. Representative source test data from emission point(s) in question
3. AP-42 emission factors
4. Industry-derived and vendor guaranteed manufacturer emission factors



# CEMs Data

- Best data
- If data available from before and after change, data can be used to see what actually happened
- Statistical tests can be used to determine significance of the change



# Source Tests

- Operating parameters can affect results
- Source can change parameters during tests
- Results can be used to create production-based emission factor
- If data from before and after change available; results can be used to look at actual-to-actual emissions
- Know why test was done: worst case vs. representative



# AP-42 Emission Factors

- Is an estimated average and range
- Factors have a range of reliability
- If emission factor used prior to change involving new equipment, should consider requiring source test



# Predictive Emissions Monitoring Systems

- Predicts emissions by analysis of process parameters through a statistical or neural net model after training model with a CEMS
- Can be useful when no CEMS data available, however, there are drawbacks:
  - Can only produce meaningful data for a range of process inputs that occurred during the training set; and
  - If violations did not occur during training set, PEMS may not produce a meaningful number when violations occur.
- Should avoid replacing CEMS with PEMS where CEMS are already installed or required