

**SCAQMD**  
**Working Group Meeting**  
**NOx RECLAIM**

**Diamond Bar, CA**  
**June 13, 2013**

# Agenda

- Welcome and Introductions
- Potential BARCT
- Data Verification/Request
- Schedule
- Open Discussion

# Potential BARCT

- Low-NOx and Ultra Low-NOx burners
- Selective Catalytic Reduction (SCR)
- Alternative technologies
- Fuel technologies

# BARCT

2005

Future  
Consideration

- |                                     |                            |                                     |
|-------------------------------------|----------------------------|-------------------------------------|
| • Ref B/H >110<br>mmbtu/hr          | 0.006 lb/mmbtu<br>(5 ppmv) | Any further<br>control<br>(2 ppmv)? |
| • Ref B/H 40-110<br>mmbtu/hr        | 0.03 lb/mmbtu<br>(25 ppm)  | 2-5 ppmv with<br>SCR?               |
| • Fluid Catalytic<br>Cracking Units | 85% Control                | Any further<br>control?             |

# BARCT

## 2005

## Future Consideration

- |                                    |                             |   |
|------------------------------------|-----------------------------|---|
| • Industrial B/H<br>>20 mmbtu/hr   | 0.01 lb/mmbtu (9<br>ppmv)   | 2-5 ppmv w/ LNB<br>or SCR?                          |
| • Industrial B/H 5-<br>20 mmbtu/hr | 0.015 lb/mmbtu<br>(12 ppmv) | 9 ppmv w/ LNB?                                      |
| • Utility Boilers                  | 0.008 lb/mmbtu<br>(7 ppmv)  | } 2 ppmv (NG)<br>w/SCR?<br>2.5 ppmv (RFG)<br>w/SCR? |
| • Turbines                         | 0.06 lb/mmbtu<br>(17 ppmv)* |   |

\*Concentration value can vary due to operating configuration

# BARCT

|                           | <u>2005</u>                                       | <u>Future Consideration</u> |
|---------------------------|---|-----------------------------|
| • Cement Kilns            | No further control                                | 85% further control?        |
|                           | 1.2 lb/ton  |                             |
| • Glass Furnaces          | (container glass)<br>4.0 - 5.6 lb/ton<br>(others) | 1.2 lb/ton (all types)?     |
| • ICEs                    | 55-60 ppmv  | 11 ppmv                     |
| • Other<br>Furnaces/Ovens | 30-45 ppmv  | Any further control?        |

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•Process Units: No further control

•Innovative ideas for reducing NOx from Major/Large sources?

# Data Verification/Request

- Survey Questionnaire
- Focus on higher emitting facilities
- Simple operations may be handled with phone call or meeting
- AQMD Staff:
  - Populate spreadsheet with Facility Permit data
  - Send data to the facility owner/operator
  - Request other information pertinent to rulemaking but part of our data base

# Data Verification/Request

- Facility owner/operator:
  - Verify data accuracy and completeness
  - Agree that data reflects the current operation and/or submit corrected data back to AQMD
  - Submit to AQMD other rulemaking information as requested

# Survey Questionnaire

## Facility Contact

1. Please provide the facility contact for this project:

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Email Address: \_\_\_\_\_

## Top NOx Emitting Equipment or Processes

(\* The attached list may contain the information requested)

2. \* Please verify the attached list for the top 10 NOx emitting equipment and processes at your facility in Compliance Year 2011 and their emissions.
3. Please mark on the attached list the NOx control equipment installed **after the 2005 NOx RECLAIM amendment**

# Refinery Example – List of Equipment

## Facility A

| FacID  | Source Type | Device ID | Device      | Process Name             | Max Unit Rating (MMBTU/hr or HP) | 2011 Emissions (lbs) | Fuel Type (note 1) | Control Technology (note 2) | Shared Stack? Shared Control? | Control Installed After 2005? |
|--------|-------------|-----------|-------------|--------------------------|----------------------------------|----------------------|--------------------|-----------------------------|-------------------------------|-------------------------------|
| 80000A | Major       | 36        | REGENERATOR | FLUID CATALYTIC CRACKING | 1206                             | 249,277              | RFG                | ESP                         |                               |                               |
| 80000A | Major       | 52        | HEATER      | HYDROTREATING            | 36                               | 33,729               | RFG                | LNB                         |                               |                               |
| 80000A | Major       | 74        | HEATER      | CATALYTIC REFORMING      | 258                              | 33,729               | PG, RFG            | LNB                         |                               |                               |
| 80000A | Major       | 6         | HEATER      | CRUDE DISTILLATION       | 136                              | 25,910               | RFG                | LNB                         |                               |                               |
| 80000A | Major       | 430       | HEATER      | HYDROTREATING            | 200                              | 18,157               | RFG                | SCR                         |                               |                               |
| 80000A | Major       | 12        | HEATER      | COKING                   | 144                              | 17,071               | RFG                | LNB, SCR                    |                               |                               |
| 80000A | Major       | 22        | HEATER      | COKING                   | 95                               | 14,427               | RFG                | LNB                         |                               |                               |
| 80000A | Major       | 768       | HEATER      | HYDROTREATING            | 110                              | 13,321               | RFG                | LNB, SCR                    |                               |                               |
| 80000A | Major       | 1550      | BOILER      | STEAM GENERATION         | 245                              | 12,416               | RFG                | SCR                         |                               |                               |
| 80000A | Major       | 8         | HEATER      | CRUDE DISTILLATION       | 49                               | 10,975               | RFG                | LNB                         |                               |                               |
| 80000A | Large       | 9         | HEATER      | CRUDE DISTILLATION       | 20                               | 5,500                | RFG                | LNB                         |                               |                               |
| 80000A | Large       | 59        | HEATER      | HYDROTREATING            | 26.4                             | 3,671                | RFG                | LNB                         |                               |                               |
| 80000A | Large       | 60        | HEATER      | HYDROTREATING            | 29.7                             | 3,644                | RFG                | LNB                         |                               |                               |
| 80000A | Major       | 429       | HEATER      | HYDROTREATING            | 30                               | 2,014                | RFG                | SCR                         |                               |                               |

Note:

1) Fuel Type. RFG = Refinery Fuel Gas. NG = Natural Gas. B = Butane. PG = Process Gas, P = Propane

2) Control Technology. LNB = Low NOx Burner. SCR = Selective Catalytic Reduction. FGR = Flue Gas Recirculation. ESP = Electrostatic Precipitator.

# Non Refinery Example

## - List of Equipment -

### Facility B

| FacID  | Source Type | Device ID | Device  | Process Name          | Max Unit Rating (MMBTU/hr or HP) | 2011 Emissions (lbs) | Fuel Type (note 1) | Control Technology (note 2) | Shared Stack? Shared Control? | Control Installed After 2005? |
|--------|-------------|-----------|---------|-----------------------|----------------------------------|----------------------|--------------------|-----------------------------|-------------------------------|-------------------------------|
| XXXXXX | Major       | 45        | BOILER  | EXTERNAL COMBUSTION   | 3350                             | 27,778               | NATURAL GAS        | FGR, SCR                    |                               |                               |
| XXXXXX | Major       | 5         | TURBINE | INTERNAL COMBUSTION   | 220.6                            | 46,866               | NATURAL GAS        | CO Oxidation Cat            |                               |                               |
| XXXXXX | Large       | 82        | ICE     | INTERNAL COMBUSTION   | 853                              | 6,104                | DIESEL             | Aftercooler, Turbocharger   |                               |                               |
| XXXXXX | Large       | 6         | BOILER  | BOILERS               | 650                              | 726                  | NATURAL GAS        | LNB, FGR                    |                               |                               |
|        |             |           |         |                       |                                  |                      |                    |                             |                               |                               |
| XXXXXX | Process     | 9         | ICE     | INTERNAL COMBUSTION   | 553                              | 94                   | DIESEL             | Aftercooler, Turbocharger   |                               |                               |
| XXXXXX | Process     | 94        | FURNACE | FORGING/HEAT TREATING | 4                                | 370                  | NATURAL GAS        | LNB, FGR                    |                               |                               |

Note:

1) Fuel Type. RFG = Refinery Fuel Gas. NG = Natural Gas. B = Butane. PG = Process Gas, P = Propane

2) Control Technology. LNB = Low NOx Burner. SCR = Selective Catalytic Reduction. FGR = Flue Gas Recirculation. ESP = Electrostatic Precipitator.

# Survey Questionnaire

## Boilers, Heaters, Furnaces, Kilns, Turbines, and Cogeneration Units (Major and Large Sources)

4. For each major and large combustion source at your facility, please verify the following information in the attached list, and provide information if the attached list does not contain this specific information:
  - a. \* Device description, Device ID, Process Name
  - b. \* Emissions in CY 2011 (tons per day)
  - c. \* Maximum unit rating (MMBTU/hr)
  - d. \* Type of fuel used
  - e. Fuel usage rate and BTU content of fuel
  - f. Flue gas flow rate (million dry standard cubic feet), temperature, oxygen and water content
  - g. Representative flue gas analysis and fuel gas analysis
  - h. NO<sub>x</sub> concentration in the exhaust flue gas (ppmv at 3% O<sub>2</sub> or ppmv at 15% O<sub>2</sub>). Please attach a copy of the most current source test reports/results.
  - i. Allowable back pressure
  - j. \* Control technology used (e.g. LNB, SCR, NO<sub>x</sub> scrubber)

# Survey Questionnaire

5. For the control technology identified in item #4 above:
  - a. Device description, Device ID
  - b. Manufacturer's name and performance. Please attach a copy of manufacturer's specification/guarantee
  - c. Design parameters (e.g. maximum flue gas flow rate, inlet and outlet ppmv, ammonia slip)
  - d. If the control device is shared between multiple NO<sub>x</sub> emitting sources, please identify all other sources that are vented to this control device
  - e. Dimension of the add-on NO<sub>x</sub> control device (e.g. length, width, height of the SCR, catalyst volume)
  - f. Cost information (capital costs, installation costs, and annual operating costs)
  - g. Installation date (e.g. July 2005)
  
6. Provide drawings that show location and distances between the major and large NO<sub>x</sub> sources at the facility.

# Survey Questionnaire

## Fluid Catalytic Cracking Units (if applicable)

7. If the facility currently uses NO<sub>x</sub> reduction catalysts, please provide:
  - a. Manufacturer's name
  - b. Usage rate (e.g. lbs of catalysts added per day)
  - c. Flue gas flow rate, temperature, oxygen, water content and flue gas analysis
  - d. NO<sub>x</sub> in the exhaust flue gas (ppmv at 3% O<sub>2</sub>). Please attach a copy of the source test results
  - e. Cost information (annual operating costs)
8. If the facility uses add-on NO<sub>x</sub> control device, please provide:
  - a. Manufacturer's name and performance. Please attach a copy of manufacturer's specification/guarantee
  - b. Design parameters (max flue gas flow rate, temperature, oxygen, water content, flue gas analysis)
  - c. NO<sub>x</sub> in the exhaust flue gas (ppmv at 3% O<sub>2</sub>). Please attach a copy of the source test report/results
  - d. Dimension of the add-on NO<sub>x</sub> control device
  - e. Cost information (capital costs, installation costs, and annual operating costs)
  - f. Installation date (e.g. July 2005)

# Survey Questionnaire

## **Reports Submitted Under the U.S. EPA Consent Decree**

9. If the facility must install control technology to reduce the NO<sub>x</sub> emissions under an U.S. Environmental Protection Agency (EPA)'s consent decree, please provide the District a copy of the most recent reports/test results submitted to the EPA related to this consent decree.

## **Feasible Control Approach Including Energy Efficiency Project**

10. List any feasible control approach that your facility plans to install, including replacement of the existing units with higher energy efficient units, to further reduce your facility's NO<sub>x</sub> emissions and green-house gases. Provide a brief description of the control approach, manufacturer's name, estimated emission reductions, and cost information.

Survey Questionnaire  
Reply by **July 12, 2013**

# Rule Development Schedule

- Facility Reply to Survey Questionnaire
  - July 12, 2013
- Working Group Meetings
  - Monthly as needed
- Public Workshop
  - September 2013
- Board Hearing
  - November 2013

# AQMD Contacts

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## Non-Refineries

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