Development of PAMS QA

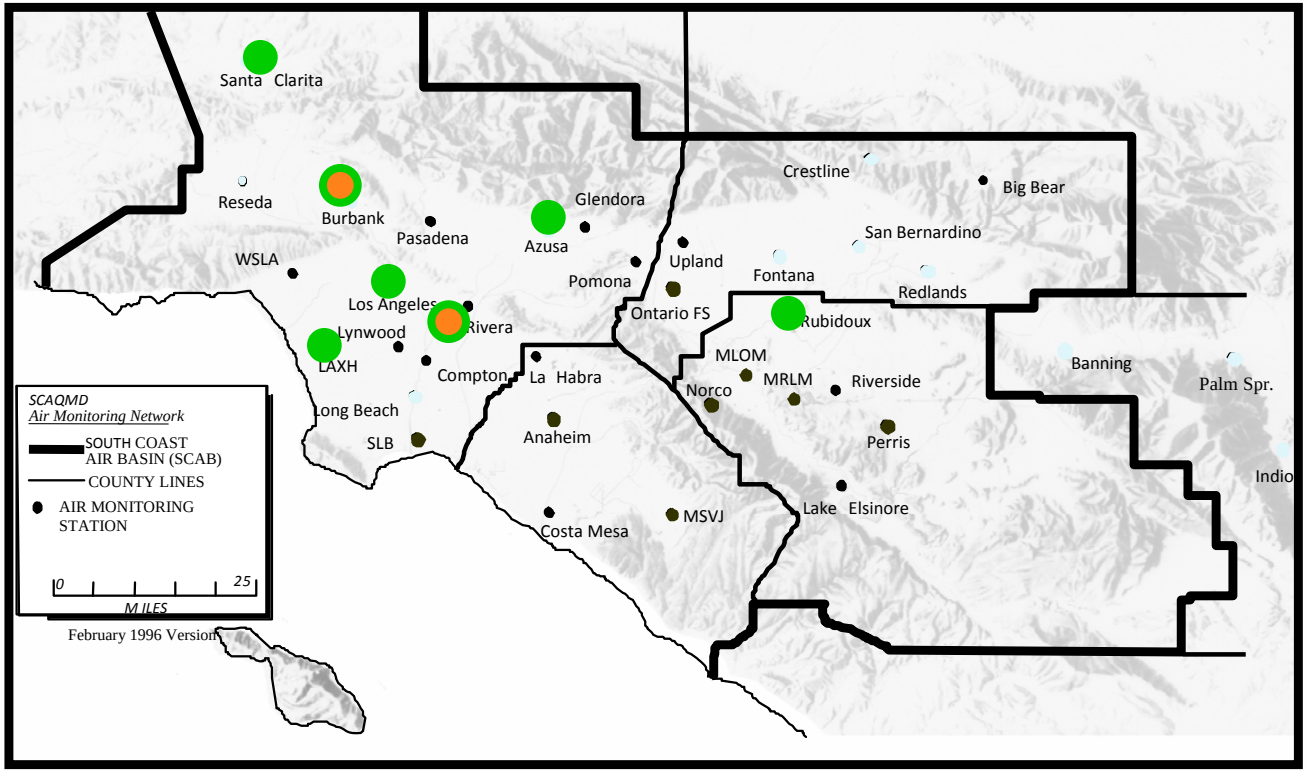
South Coast Air Quality Management District
2009 National Ambient Air Monitoring Conference
November 4th, 2009

South Coast Air Quality Management District

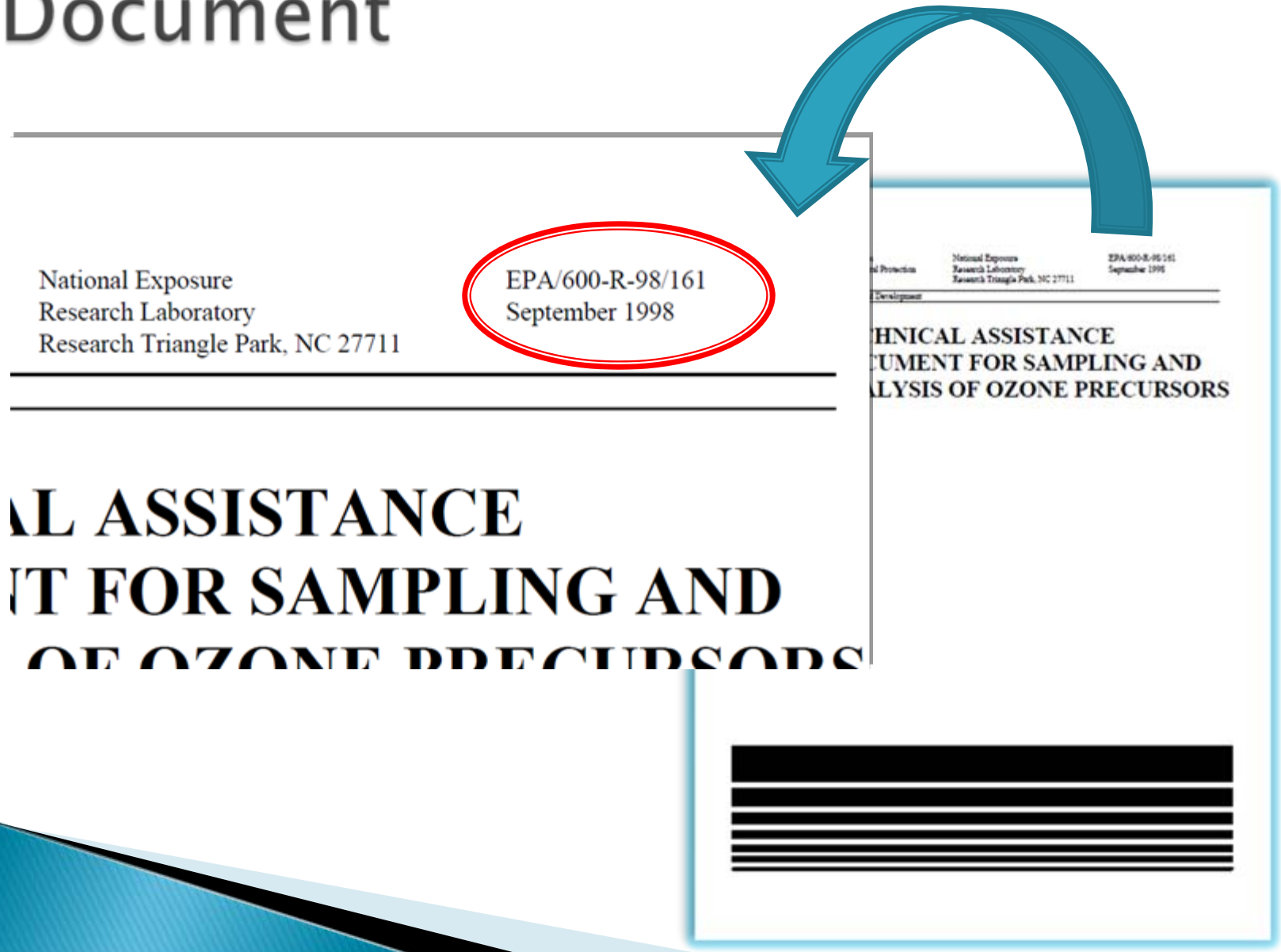
The South Coast Air Quality Management District includes all of Orange County and portions of Los Angeles, San Bernardino and Riverside Counties, an area of 10,743 square miles with 18 million people and 12 million vehicles.

SCAQMD PAMS Sites

Canister Sampling In-Situ Gas Chromatograph Both



PAMS Technical Assistance Document



Bias

- Performance Evaluations
  - Analytical bias: reference standards for VOCs and Carbonyls
    - High level NIST standard from cylinder
    - Spiked DNPH Cartridges

Bias

- Issues
  - High Levels in NIST standard not reflective of ambient concentrations
    - 2009 U.S. EPA Region 9 trial: low level concentration PE
  - Carbonyl PEs have not been conducted in a while
    - Thank you Dennis Mikel for NATTS PE!
  - Sampler Bias – Flow Rate
    - Critical for Carbonyls
    - Systematically important for VOCs
  - In-Situ GC Bias not well addressed

Bias – Field GC Analyses

- Through the Probe (TTP)
  - Most representative PE

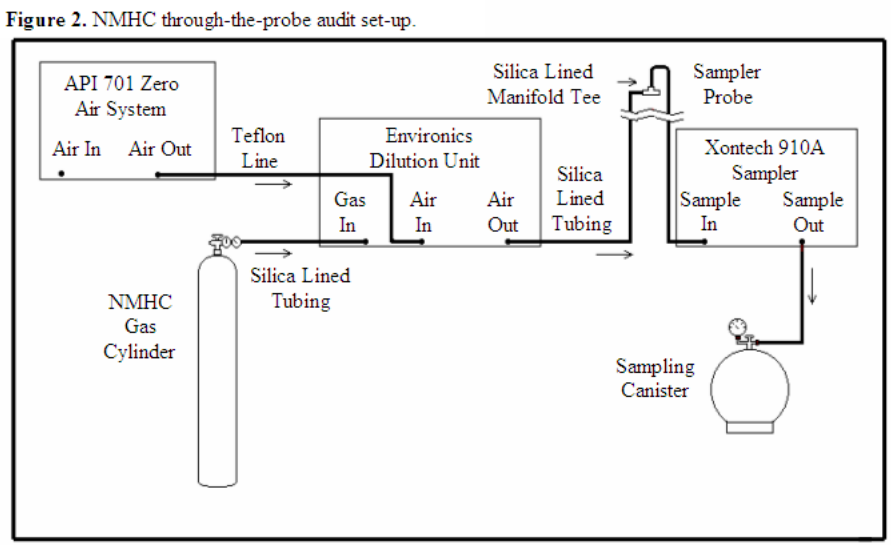


Figure 2. NMHC through-the-probe audit set-up.

Miguel, ARB, 1997

  - Precedence
    - CARB (in the past)
    - MDEQ recently implemented (Kilmer)

Bias – Field GC Analyses

- Issues: TTP

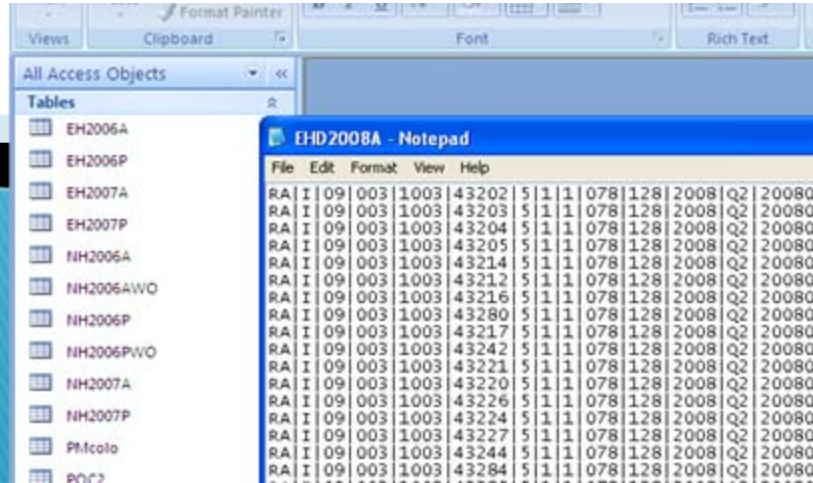
$$$$$ +

•Implement as part of NPAP
- Resource Leverage
- Round Robin

Preparing PAMS P&A Data For Submission (CTDEP)

Accuracy:

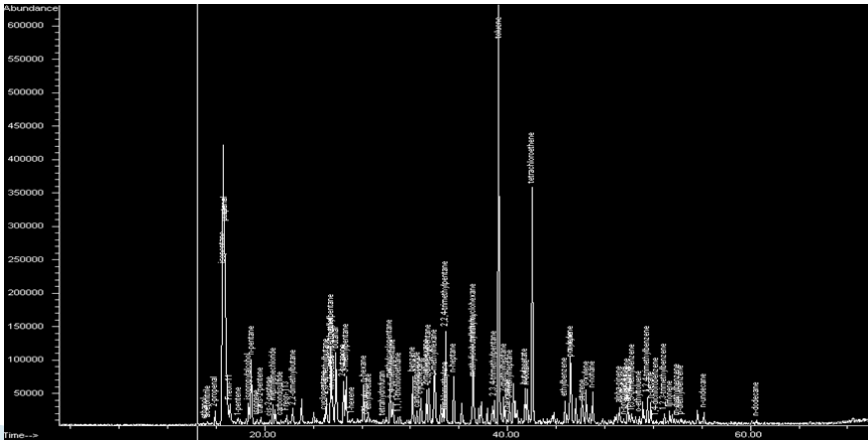
1. High cals are run two or three days a month two to three times each calibration day.
2. Gather a subset of data to be submitted in excel format. 1 High cal run (Canister concentration as is) for each Month. The last calibration of the day of the second calibration day of the month is used.
3. Excel file is pulled into a database and appended to a formatted table (Routine values are defaulted i.e. state code “09”.) Each site is pulled in separately to code the site with a default setting.
4. Now formatted, files are exported to a text file and delaminated by “|”.



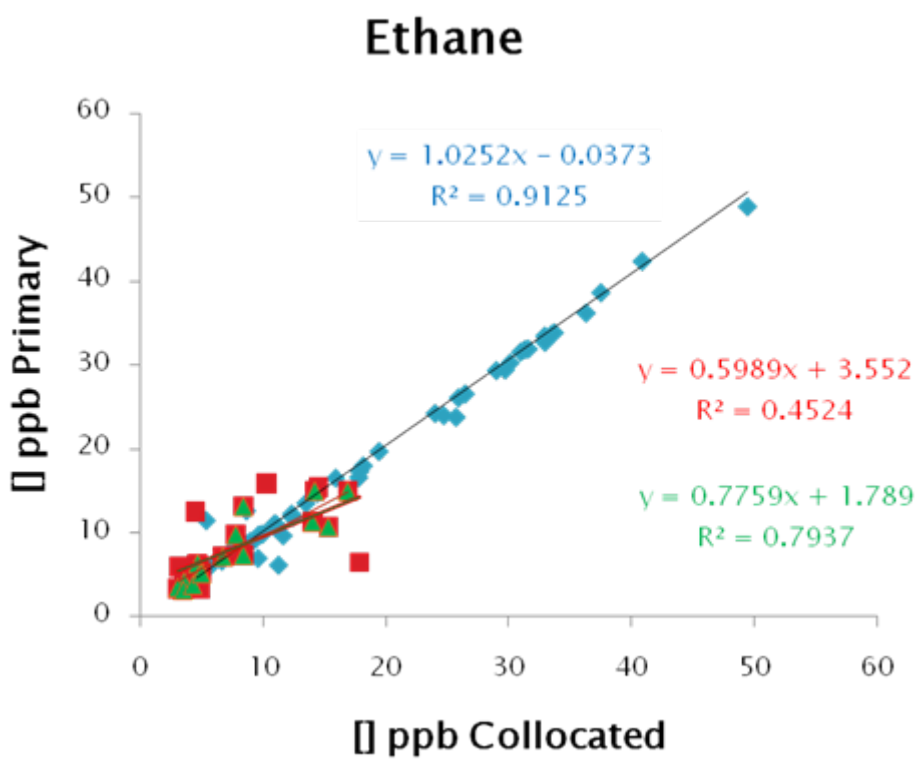
PAMS P&A Data has been submitted to AQS for 2006-2008 by CTDEP.

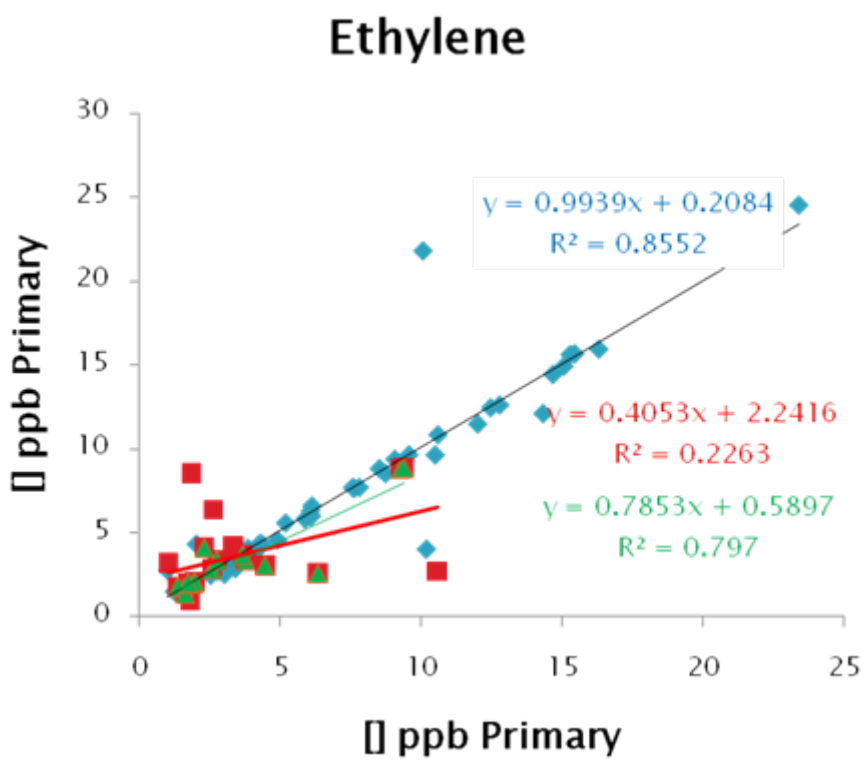
Precision (TAD Section 2.8)

- Sampling precision: Collocation
  - 24 Hour integrated samples
  - 3 Hour integrated samples – not directly mentioned
- Analytical precision: sample duplicates
- Method precision: inter-laboratory round robin



Results: Collocation (SCAQMD)

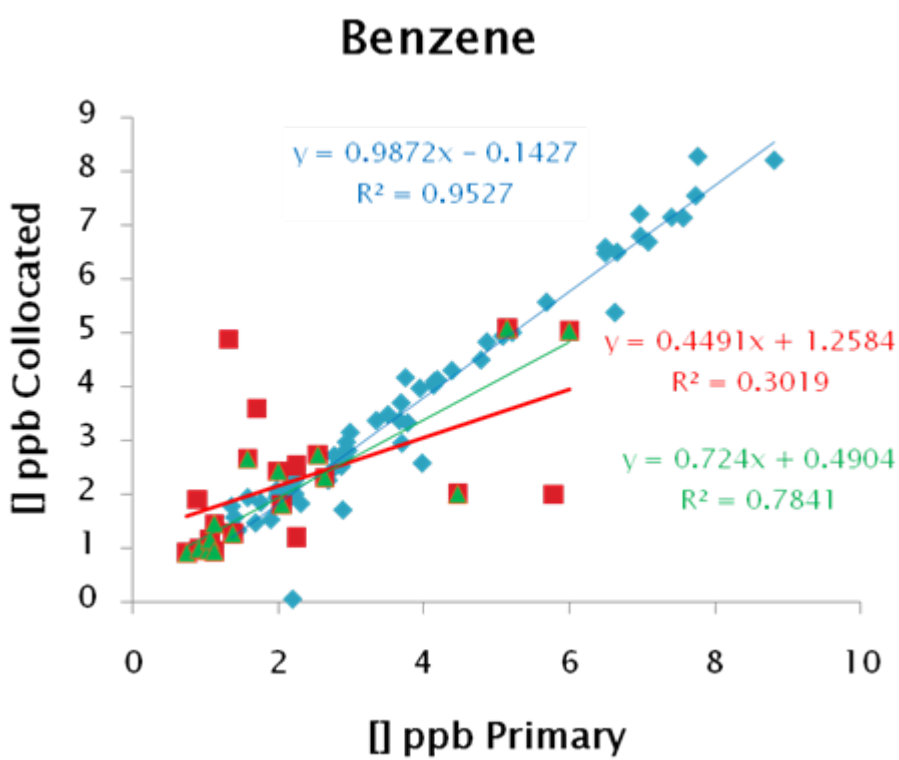


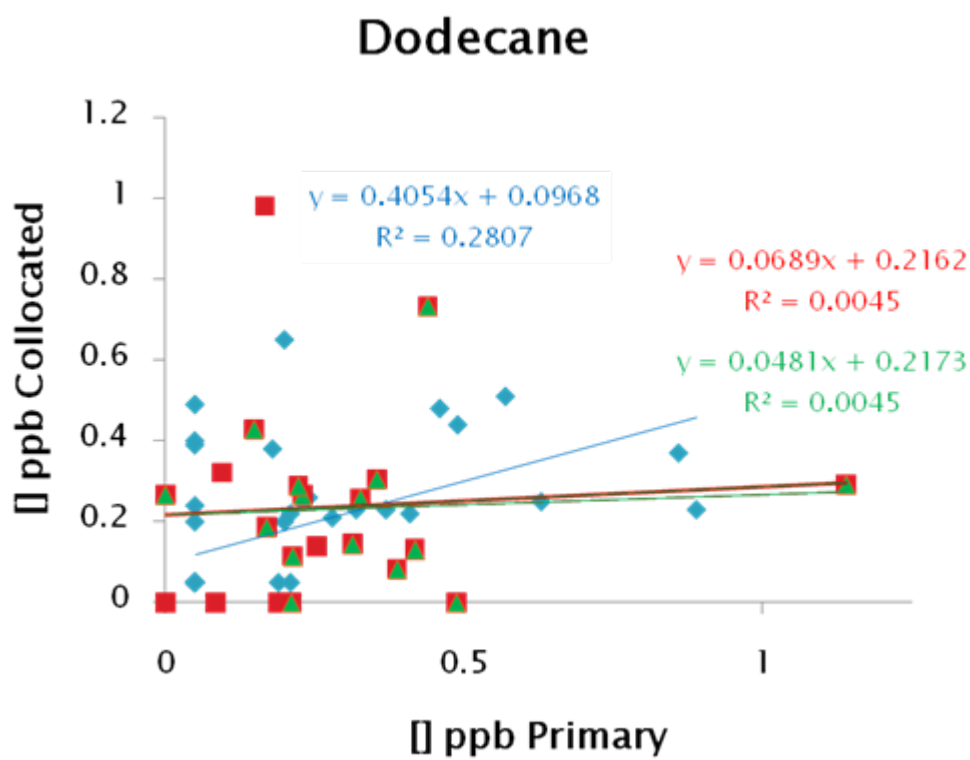


2008 24 Hr | 2009 3 Hr | 3 Hr (editted)

Linear (2008 24 Hr) | Linear (2009 3 Hr) | Linear (3 Hr (editted))

Results: Collocation (SCAQMD)



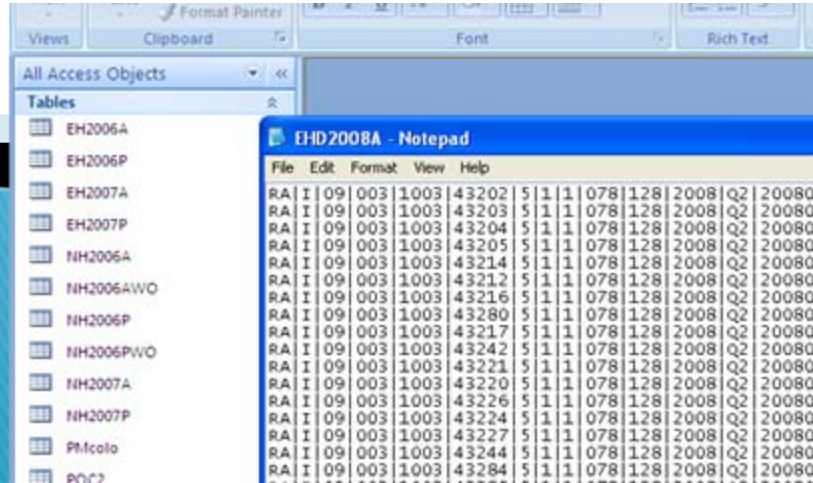


2008 24 Hr | 2009 3 Hr | 3 Hr (editted)

Linear (2008 24 Hr) | Linear (2009 3 Hr) | Linear (3 Hr (editted))

Preparing PAMS P&A Data For Submission (CTDEP)

A. Precision:
   1. Auto calibrations (1/10th dilution) are run every 50-hours.
   2. Gather a subset of data to be submitted in excel format. 1 Auto cal run for each of the PM 1-6 schedule days. If auto cal run does not fall directly on the scheduled day + or – 1 day is taken.
   3. Excel file is pulled into a database and appended to a formatted table the AQS required fields are already established and formatted. (Routine values are defaulted i.e. state code “09”.) Each site is pulled in separately to code the site with a default setting.
   4. Now formatted, files are exported to a text file and delaminated by “|”.



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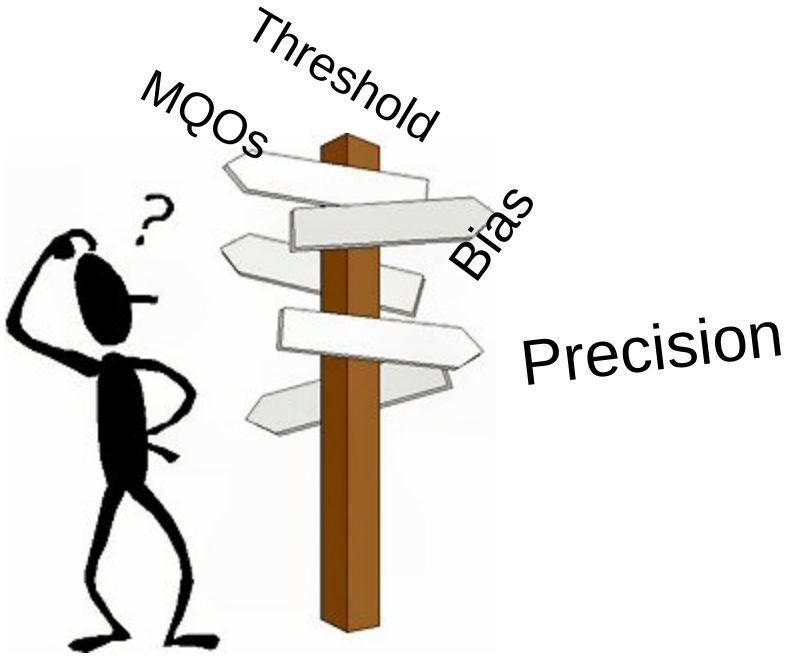
Other Issues: Field GC System QC

- Sampler flow rate
- Sampling vessel cleanliness
- Carryover effects

Other Issues:
Data (In) Validation



- Criteria Tables
  - •Critical
  - •Systematic
  - •Operational

Other Issues: Canister Cleanliness

- TAD recommendation
  - Initial Certification of all Canisters (10 ppbC)
  - One out of Eight afterwards

- SCAQMD findings
  - One out of eight was not enough
  - Three out of eight is currently practiced
  - UHP gas quality varies

Next Steps/ Discussion:

- Discuss Bias and Precision Issues
  - NPAP?
  - PAMS inter laboratory round robins
  - Field GC
    - Feedback on CDEQ approach
    - Collocation 3 Hour sampler with *In-Situ* GC system
- AQS summary reports and validation criteria for Precision/ Bias for non-criteria pollutants
- PAMS QA consensus from State, Locals and U.S. EPA
  - Conference Calls
  - Update PAMS TAD

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