



Laboratory and Sampling Developments

**National Pretreatment & Pollution
Prevention Workshop**

November 14, 2007



Federal Advisory Committee – Detection and Quantitation and Their Uses

- Detection – threshold for “Is it there?”
- Quantitation – threshold for “How much is there?”
- EPA’s version
 - Method Detection Limit (MDL) – calculation procedure for detection described in Appendix B, 40 CFR Part 136
 - Promulgated in 1984
 - Minimum Level (ML) is 3 times the MDL



Why Care about Detection and Quantitation?

	Facility X	Facility Y
Analyte	Aluminum	Chromium VI
Water Quality Standard	87 ug/L (chronic) 750 ug/L (acute)	11 ug/L (chronic) 16 (acute)
WQBEL	DML = 87ug/L AML = 58 ug/L	DML = 16 ug/L AML = 8 ug/L
Method Quantitation Limit	Method 208 100 ug/L (MQL)	Method 218.4 10 ug/L (ML)



What Got Us Started?

- ❑ Longstanding concerns about how the MDL/ML is calculated and used in laboratory and regulatory programs
- ❑ Industry filed suit challenging the procedures used for determining detection and quantitation levels
- ❑ EPA and Industry reached a settlement agreement in October 2000 which lead to an assessment of detection and quantitation procedures, and a proposal to revise the ML/MDL procedure
- ❑ Received 136 comments indicating EPA could do better
- ❑ On November 1, 2004, decided to withdraw rule amendments and conduct a situation assessment by a neutral third party



What Did the Situation Assessment Recommend?

- Common issues
 - Current MDL/ML does not sufficient account for variability of results within and between labs
 - Need to address background contamination, matrix and recovery effects, false positive and negative rates
 - Need for a common set of terms and definitions
 - Need for consistency use of MDL and ML in reporting and determining compliance
- Recommendations
 - Federal Advisory Committee should be formed to reach agreement on
 - Definition of terms
 - One or more approaches for detection and quantitation for Clean Water Act purposes. Pilot test most promising procedures before deciding.
 - Interpretation and uses of numbers
 - FAC should be balanced set of stakeholders; EPA should be at the table.
 - FAC recommendations should be incorporated in rulemaking
- FAC charter effective May 31, 2005 for two years.



Who is on the FAC?

4 members each

- Environmental labs
- Water Utilities
- Environmental Community (one later resigned)
- Industry
- State Government

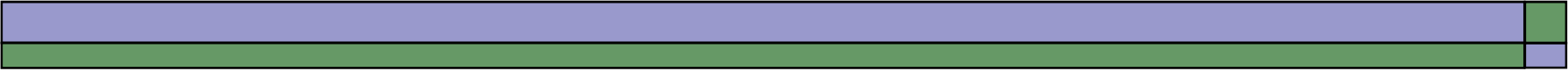
1 member

- EPA



What's Happened Thus Far?

- 8 face-to-face meetings of the FAC; two FAC conference calls; over 100 meetings of several workgroups, subgroups and strike teams
- Pilot study of candidate detection/quantitation procedures
 - A dozen candidates narrowed to three pairs
 - Tested five methods over several weeks in 6-8 labs
- Original FAC Charter extended on May 30, 2007 to allow FAC to finish its work by end of CY07
- In September 2007, “resolution” of all issues; some consensus, other majority/minority opinions



What were the “Resolutions?”

- ❑ All in agreement that ML/MDL needs to be replaced; single-lab procedure identified but no consensus on all aspects of the new procedure
- ❑ New procedure should be pilot tested and peer reviewed
- ❑ EPA’s Drinking Water and Solid Waste Programs should consider using new procedure
- ❑ Regular validation important
- ❑ Measurement quality objectives (MQOs) important; various opinions about need for minimum or target MQOs
- ❑ Many want national guidance on matrix effects



More on “Resolutions?”

- Close to consensus on how detection and quantitation should be used in NPDES permits
 - Reporting
 - Calculation of monthly average
 - Compliance determinations
- National Quantitation Limit will be important benchmark for NPDES reporting and compliance; procedures on how National Quantitation Limits are calculated should be promulgated by EPA
- Did not have time to deal with uses for other CWA purposes
- Implementation will be critical
- EPA should devote resources to ensure implementation and promulgation of better analytical methods



What are the next steps?

- Last meeting Dec. 5,6 to finalize report to EPA
- EPA plans to proceed to rulemaking
 - Must decide what to do with majority/minority opinion issues
 - Pilot test and peer review the new procedure
 - Rulemaking and guidance
 - Implementation



What are the Implementation Issues?

- What is the lead time labs need to learn the new procedure?
- Which states will need to make corresponding changes in their rules and should this influence the effective date of any new rule?
- How do we ensure method developers are aware of the new changes?
- The reporting and compliance determination recommendations rely heavily on the existence of National Quantitation Limits which raises several issues:
 - Full implementation will take years. How do we operate a dual system in the meantime?
 - How does EPA prioritize the creation of National Quantitation Limits for existing and new methods?
- What guidance is needed for states?
 - Confusion between the old and new program, and lots of different QL types (national, state, permit, lab)
 - Guidance accompany the final rule would ensure consistent state implementation and a level playing field
 - Coordination with EPA Regions and States critical – training and workshops are needed regarding permit writing, reporting, and compliance determinations



POTW Study

- Initially
 - Not a redo of EPA's "50 POTW-Study," but would, in part, characterize performance changes of last 20 years
 - Measure influent and effluent concentrations of traditional and nontraditional ("emerging contaminants") pollutants
 - This study focused on POTWs using well-designed and well-operated secondary treatment
 - Identify technology that treats nontraditional pollutants
- Original goals have changed significantly; focus now on nontraditional pollutants and nutrients



What Has Been Accomplished?

- Site visits at several POTWs with several mgd flow and significant industrial wastewater contribution
- Sampled four POTWs that met this industrial bias
 - Found traditional pollutants (metals, volatiles, nutrients)
 - No EE2 or Bisphenol A (plasticizer in your water bottle) detected in the samples with initial methods
 - Caffeine, Cholesterol, Acetaminophen, Ibuprofen found in abundance in influent and mostly not detected in the effluent
- Revised and peer reviewed initial analytical methods that measure pesticides, steroids/hormones and Rx/OTC drugs to improve sensitivity and selectivity



Where Are Our Study Goals Now?

- ❑ Study objectives and selection criteria focused on likely occurrence of Pharmaceuticals and Personal Care Products (PPCPs).
- ❑ Sample POTWs with mostly domestic discharges
- ❑ Will try to characterize treatment efficacy of technologies based on literature review



What Have Been Some of the Challenges?

- ❑ Need to “redevelop” and validating several existing PPCP methods for both wastewater and sludge
- ❑ Selecting facilities likely to have greater concentrations of PPCPs
- ❑ Procuring labs capable of accurately performing analysis
- ❑ Resources – sampling and analysis are very expensive; in future may be able to narrow PPCPs analyzed



What are our Next Steps?

In FY08,

- ❑ Conduct several one-day screener sampling episodes outside DC
- ❑ Scope logistics/costs to sample Potomac River Basin
- ❑ Conduct site visits at four more POTW candidates
- ❑ Determine next steps



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