EPA's Analytical Environmental Data Management Needs

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DISCLAIMER

- *The views expressed in this presentation are those of the author and do not necessarily reflect the views or policies of the U.S. Environmental Protection Agency.*

EPA's Forum on Environmental Measurements (FEM)

- Established in 2003 to:
  - Promote consistency and consensus within the EPA on measurement issues
  - Provide an internal and external contact point for addressing measurement methodology, monitoring, and laboratory science issues with multi-program impact

FEM

- Develops policies to guide the Agency's measurement community in:
  - Validating and disseminating methods for sample collection and analysis
  - Ensuring that monitoring studies are scientifically rigorous, statistically sound, and yield representative measurements
  - Employing a quality systems approach that ensures that the data gathered and used by the Agency is of known and documented quality

EPA Monitoring Assessment: Background

- From June 2009 - October 2011, FEM conducted a monitoring assessment and strategy effort across EPA
- Used a stepwise process to:
  - Develop an inventory of monitoring programs
  - Conduct a needs and data gaps analysis
  - Identify leveraging opportunities

Assessment Results
Common Themes (1)

- Data Management
  - There are multiple databases, processes, procedures, and methods for the same information
  - There is a need to develop a consistent and stable business driven framework with all data generated registered into an Agency catalogue

Assessment Results
Common Themes (2)

- Data Analysis or Assessment
  - Confidence in the reliability of data and ability to use data appropriately are important
  - Consistent application of the data life-cycle and greater use of data quality policies for greater confidence

EPA Analytical Data Management: Why it is the way it is

- Statutory: EPA programs have authorities under different environmental laws
- Data Sources: EPA receives data from different types of laboratories

Example: Analytical Methods Impact

- Development process
  - Different names for same/similar terms
- Reporting Requirements
  - Different needs for data assessment

Different Names for Similar/Same Terms

- Term: A method blank spiked with known quantities of analytes
  - Called Laboratory Control Sample (LCS) by EPA ORD, OSWER and OCSPP
  - Called Ongoing Precision and Recovery Standard (OPR) by EPA OW
- Other terms used: Laboratory Fortified Blank, Spiked Blank

FEM Solution

- Environmental Measurement Glossary of Terms (January 2010)
- Located at: http://www.epa.gov/fem/pdfs/Env_Measurement_Glossary_Final_Jan_2010.pdf

Reporting Requirements

- Superfund Contract Lab Results: labs submit all Quality Control (QC) data to EPA (including instrument output information) to allow for analyte identification and result recalculation (for legal defensibility)
- SDWA MCL Lab Results: Lab QC data generally not reported to EPA

Different Needs for Data Assessment

- Superfund: Laboratory Results used for site cleanup and determining potentially responsible party liability
- Safe Drinking Water Act: Laboratory results used to determine if Maximum Contaminant Levels (MCL) for pollutants in drinking water are exceeded

FEM Solution

- An Action Team for Environmental Data Management has been formed
- Team is focusing on Field and Analytical Data (with related meta data)

EPA Laboratory Data Sources

- Research
- Program
- Regional
- Contract

EPA's Research Laboratories

- Perform research to support EPA's
  - Environmental standards
  - Risk Assessments
  - Risk Management Decisions

EPA's Program Laboratories

- Primary responsibility at the national level
  - Support regulatory development
  - Ensure compliance with EPA's regulations
  - Enforcement (civil and criminal)

EPA's Regional Laboratories

- Provide scientific support for
  - Region specific environmental programs
  - Site Remediation
  - Ambient monitoring for air and water
  - Non-routine activities like emergency response

Contract Laboratories

- Perform routine analyses at Superfund Sites
  - site remediation
  - monitoring

Data Source Issue

- Environmental Testing laboratories use a wide variety of instruments
- At this time there is no industry standard for instrument outputs
- Instrument data (which forms the basis of analytical results) generally not accessible after software upgrades or instrument replacement

Possible Solution

- Adoption of a Consensus Based Standard for Instrument Data by Agencies
- An example of such a standard – ASTM's Analytical Information Markup Language (AnIML) XML standard for analytical chemistry data

Approach for AnIML Implementation

- Contracts with instrument vendors and contract laboratories will need to be modified to require AnIML output capability
- A basic AnIML checker will be needed to assist AnIML adopters to check if their vendors' instruments actually meet AnIML requirements

Two Related Network Sessions

- **Untangling the Web of Electronic Data Deliverables**
  - Tuesday March 19
  - Room 307 Marriott
- **Standard Instrument Outputs and Envtal Data Standardization at EPA and NIST**
  - Wednesday March 20
  - Room 304 Marriott
- Session Timing: 08:30 to 10:30 AM

Contact Information

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