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



- 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.p df



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



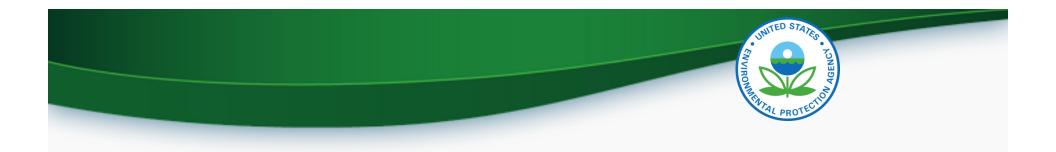
FEM Solution

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



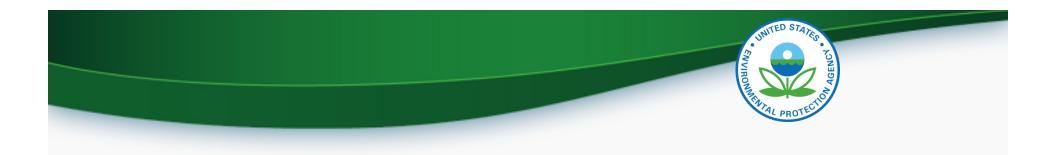
EPA Laboratory Data Sources

- Research
- Program
- Regional
- Contract



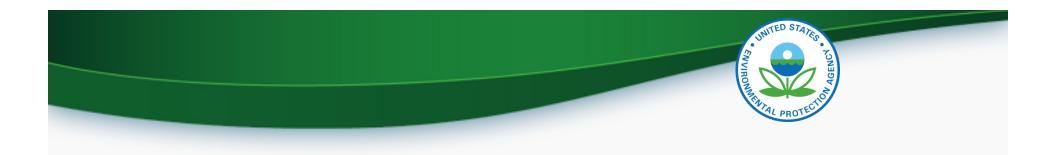
EPA's Research Laboratories

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



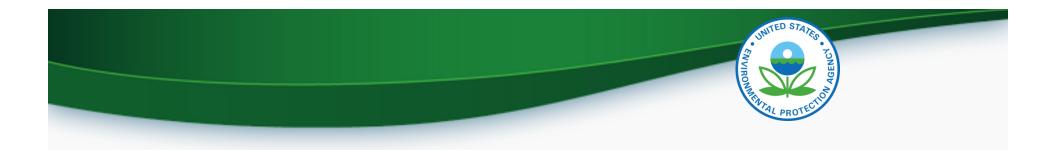
EPA's Program Laboratories

- 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



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