The Environmental Monitoring Coalition

EMC provides an opportunity for the environmental laboratory community to develop consensus recommendations to present to federal, state, and tribal agencies to address environmental monitoring issues.

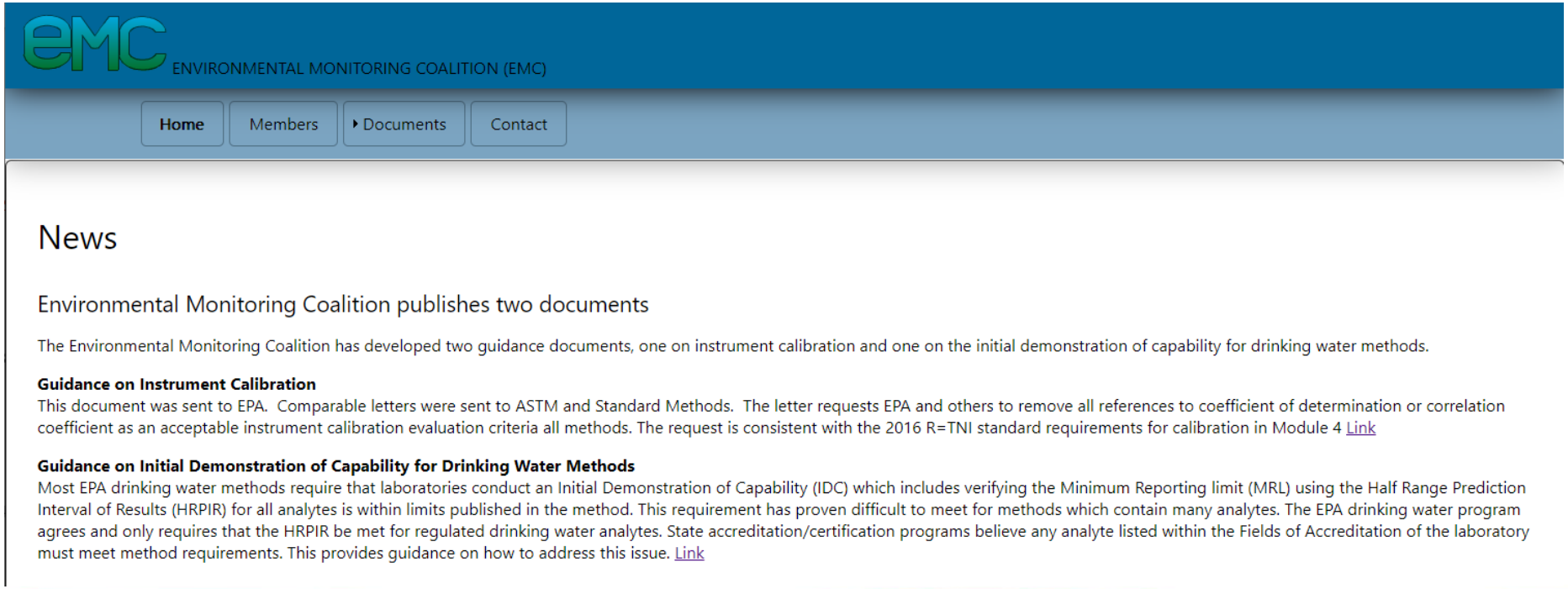
Background

EPA's Environmental Laboratory Advisory Board (ELAB) created in 1997 to develop consensus recommendations for requirements regarding:

- nationally recognized environmental laboratory accreditation;
- national recognition of the program-administering accreditation authorities, and
- advancement of the EPA's measurement programs in areas such as:
  - Validating and disseminating methods for sample collection and analysis;
  - Developing scientifically-rigorous, statistically-sound, and representative measurements;
  - Employing the performance paradigm in environmental monitoring;
  - Improving communications and outreach between EPA and its stakeholders; and
  - Employing a quality systems approach that ensures the data gathered and used by EPA are of known and documented quality.
- ELAB was disbanded by the previous administation in October 2019
- EMC was created by members of the environmental monitoring community in 2020 to address this void.

EMC

- A coalition, not an organization
- No tax ID, no staff, no phone number, no bylaws, no formal structure
- Minimal website presence (https://envmoncoalition.org/)



EMC and ELAB

EMC

- No formal connection to EPA
- Can make its own rules
- Reports published on EMC website (and old ELAB reports as well)
- Members can serve unlimited terms

ELAB

- A federal advisory committee reporting to EPA
- Must abide by FACA rules
- Reports published on EPA website (but disappeared in 2019)
- Members can serve 2 3-year terms

EMC Membership

- 4 Individuals representing the Sponsors of the Coalition

- Other individuals from these stakeholder groups:
  - State regulatory agencies
  - Laboratories,
  - Academia,
  - Data users, and
  - Environmental monitoring organizations including consulting firms, instrument manufacturers, laboratory assessment bodies, and others involved in environmental monitoring.

EMC "Voting" Members

Jordan Adelson	US Navy
Kristin Brown	Utah Department of Health
Richard Burrows	Eurofins Environment Testing America (Retired)
Michael Delaney	Massachusetts Water Resources Authority (Retired)
David Friedman	American Council of Independent Laboratories
Jay Gandhi	Metrohm USA
William Lipps	Shimadzu Scientific Instruments
Mary Johnson	Rock River Water Reclamation District
Kitty Kong	Chevron
Sharon Mertens	Milwaukee Metropolitan Sewerage District
Judy Morgan	Pace Analytical
Jerry Parr	The NELAC Institute
Steven Rhode	Massachusetts Water Resources Authority
David Thal	Environmental Standards
Sarah Wright	Association of Public Health Laboratories

EMC Guests

- Anyone else who would like to participate
  - EPA
  - State Agencies
  - Consultants
  - Laboratories
  - Instrument suppliers
  - ….

EMC welcomes the full and active participation of everyone.

Objectives

- Improve the Quality of Environmental Monitoring Data.
  - Collaborate with EPA and Voluntary Consensus Standard Bodies (VCSBs) to ensure test methods for sample collection and for analysis of environmental samples are adequately developed and validated;
  - Encourage the performance approach in environmental monitoring and regulatory programs, where applicable;
  - Promote a quality management systems approach that ensures that environmental monitoring data are reliable;
- Reduce the Cost of Environmental Monitoring.
  - Foster the development and adoption of new analytical instrumentation and methods that minimize solvent use, reduce waste and improve analytical processes.
  - Work to harmonize differences between test methods that use the same underlying technology.

Process

- Monthly conference calls to discuss action items
- Task Groups (members and guests) develop reports, work plans, letters, and other items to present to the Coalition for approval.
- Calls include many “Guests,” including significant participation from EPA program offices.

Actions Completed to Date

- Conducted a rigorous evaluation for sample preservation and holding times for acrolein and acrylonitrile in a variety of environmental media.
- Evaluated current approaches for instrument calibration and developed recommended changes for the Office of Water, the Office of Environmental Land Management, and EPA's Environmental Methods Forum.
- Developed recommended changes to EPA Method 200.8 to include specific Quality Control (QC) criteria for the use of collision/reaction cell technology to improve the sensitivity, accuracy, and linear range of the method.
- Developed guidance for state accreditation/certification agencies to use when assessing laboratories performing drinking water analyses.
- Collaborated with WEF and Standard Methods on issues concerning various test methods including correlation of BOD/TOC and constant weight for TSS.
- Provided comments on draft EPA Method 1633

Acrolein/Acrylonitrile

Issue

- Environmental monitoring organizations including consulting firms, instrument manufacturers, laboratory assessment bodies, and others involved in environmental monitoring.

Preservation

- pH < 2 preserves the acrolein and acrylonitrile as well as, if not better than the current requirement.

Holding Time

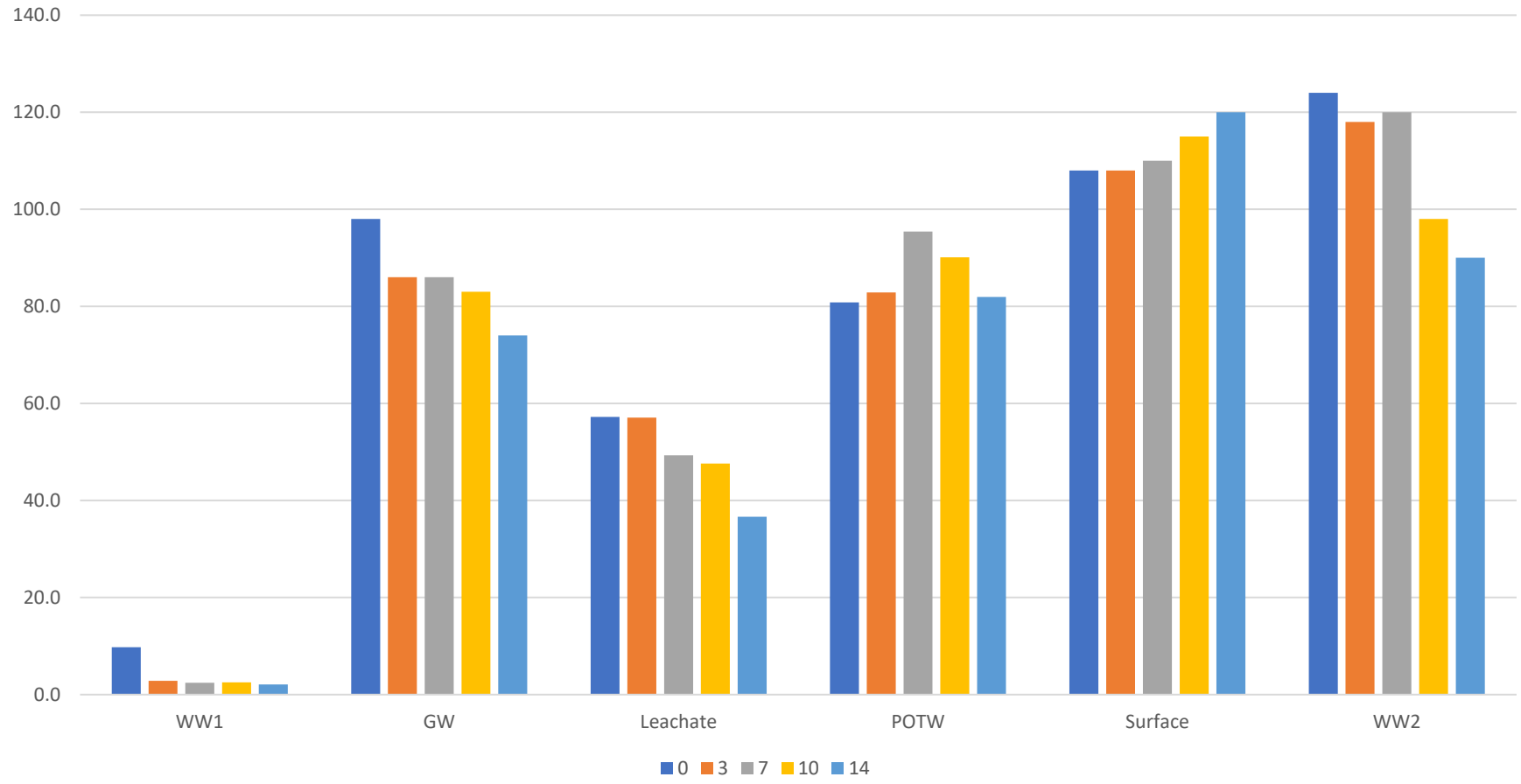
- For acrolein, with pH < 2 acidification, after a 14 day holding time recoveries are at least 80%, with the exception of one of the industrial wastewaters, where the acrolein was lost almost immediately, with all the preservatives.
- For acrylonitrile, with pH <2 acidification, there was little or no loss of analyte during a 14-day holding time.

Impact

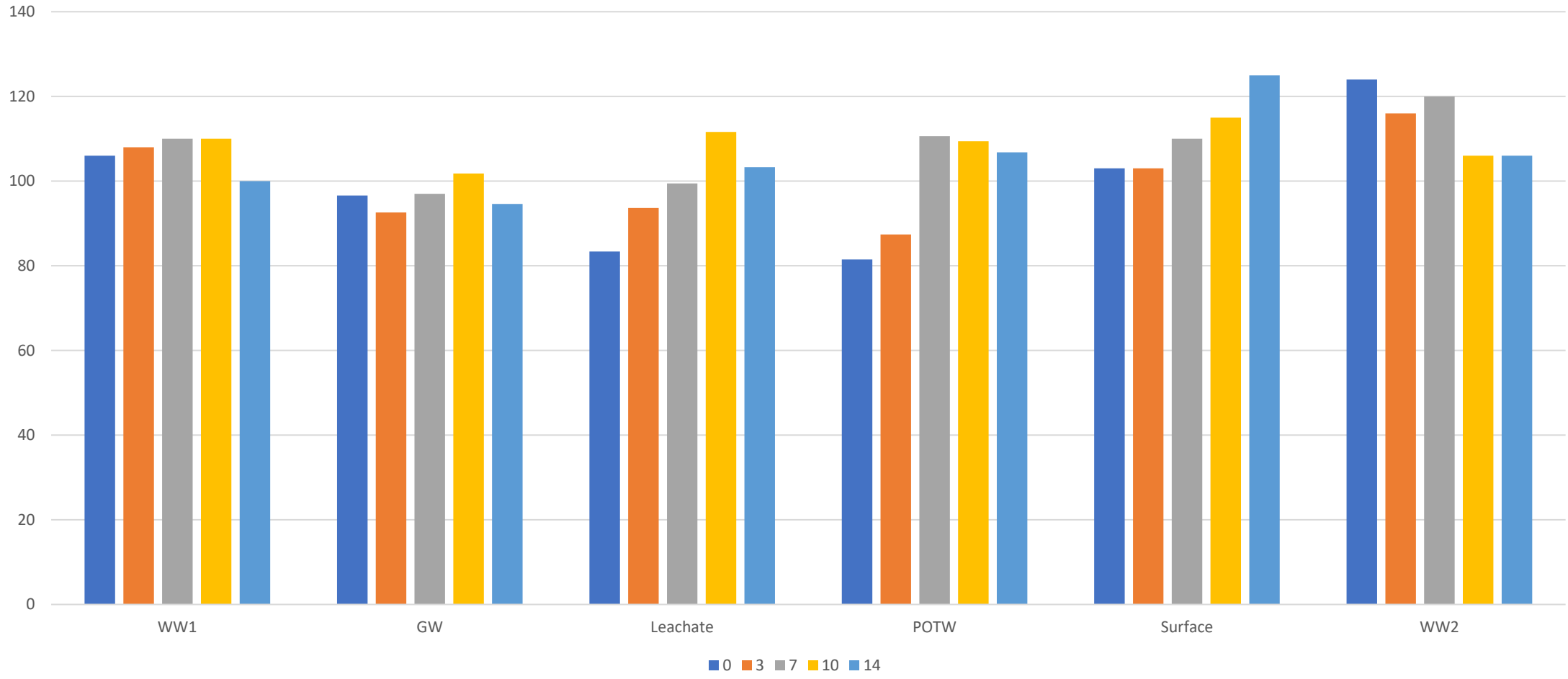
- **One sample preservation**
- **Better quality data**
- **Fewer Analyses**

Report sent to EPA and available at: https://envmoncoalition.org/docs/HT%20Study%20Report%20220302r.pdf

Acrolein pH ≤2 Preservation Across Media



Acrylonitrile pH 2 Preservation Across Media



Instrument Calibration

Issue

- Some EPA methods allow for the use of correlation coefficient (r) or coefficient of determination (r^2) if though the current science proves this is not an appropriate use of these

Table 1. Analysis by Time-of-Flight Mass Spectrometry

Analyte	Linear Unweighted			Quadratic Unweighted		
	R2	RE, %	RSE, %	R2	RE, %	RSE, %
Hexadecane	0.998	1109	213	1.000	326	134
2,4,5-Trichlorophenol	0.996	1335	535	1.000	220	90.4
Chrysene	0.999	166	62.4	1.000	142	68.7
Analyte	**Linear Weighted**			**Quadratic Weighted**		
	R2	RE, %	RSE, %	R2	RE, %	RSE, %
Hexadecane	0.963	<30	18.5	0.986	<30	13.2
2,4,5-Trichlorophenol	0.958	<30	19.8	0.985	<30	13.8
Chrysene	0.985	<30	11.7	0.987	<30	12

Instrument Calibration

- Remove all references to r and r^2 in test methods
- Replace with relative error (RE) or relative standard error (RSE)
- Letters sent to ASTM International, EPA, and Standard Methods
- Strong support from EPA for making this change

Impact

- **Better quality data**
- **Consistent with TNI**

EPA letter on the EMC website

IDOC for Drinking Water

Issue

IDOC requirements in many drinking water methods, specifically, HR_{PIR}, do not have an allowance for sporadic failures

EMC Actions

- Original effort, supported by OGWDW, would be to exclude non-regulated analytes.
- This approach rejected by ABs and EMC agreed.
- Revised approach recommends corrective action per TNI.
- Revised approach sent to all state accreditation/certification agencies.

Impact

- **Provides laboratories a solution to this issue**

200.8 Interference Reduction Technology

Issue

- This technology has been available for 25 years and has been demonstrated to reduce interferences.
- The technology, while allowed in 200.8 by the wastewater program, is not allowed in the drinking water program.

EMC Actions

- Initial effort focused on rewriting method to address EPA concerns.
- That approach abandoned due to concerns of the EPA method approval process.
- Revised approach focused on a QC specification that could be added to Appendix A of Part 141.
- QC specification would be an interference check sample containing rare earth elements.
- Recommendation provided to EPA in November 2021.
- Special session on this topic August 5.

Impact

- **Allows IRT to be used for drinking water**

Method 1633

Issue

- Draft Method 1633 contains many requirements that are not in other PFAS methods

EMC Actions to Date

- Provided informal technical and editorial comments on draft method.

Planned EMC Actions

- Will provide formal comments when method is proposed to be approved in Part 136.

Impact

- **Address laboratory concerns**

Other Actions Underway

- QC Criteria Effort
  - Update QC tables for Methods 608.3, 624.1, 625.1
  - Beta test of EDD underway
- Continued meetings with key EPA individuals to discuss both immediate issues and long-term goals

Major Long-Term Goals

1. Work with EPA, Voluntary Consensus Standards Bodies (VCSBs), and other groups to define performance goals when developing, validating and approving environmental test procedures – **Effective Methods**
2. Work with EPA, VCSBs, and other groups to standardize approaches for requirements such as instrument calibration and quality control based on the current best science. – **Consistent Approach**
3. Support the efforts of other organizations (e.g., ACIL and TNI) to expand NELAP into a true national environmental laboratory accreditation system that covers all environmental monitoring programs to ensure reliable monitoring data. – **Reliable Data**

Goal 1. Effective Methods

Problem Statement

- The instrument manufacturing industry has and continues to develop innovative new techniques and equipment for environmental monitoring. This equipment, often adopted immediately worldwide except in the US, has the potential to increase the accuracy of, while decreasing the cost of testing, and improve productivity. However, before such technologies can be used, EPA approval of methods using the technology is needed. Approval of new methods is a slow process which decreases laboratory productivity and results in huge financial barriers for innovators to develop and market new products. The net result is that testing costs are higher for US laboratories and consumers than they need to be and technology innovators are reluctant to invest in developing new instruments or techniques in the US.

Goal 1. Effective Methods

Possible Solution

- For any new monitoring need (methods for new analytes of concern or the need to measure contaminants at lower levels), EPA could collaborate with EMC to better make use of the expertise in the community to determine appropriate analyte target lists, levels of accuracy, precision, and detection limits needed to address the EPA need and that are achievable. Once a consensus decision is reached on the method requirements needed, EPA and EMC would seek a VCSB to develop and validate the method.

- Most VCSB include members from industry with the resources available to develop new instruments or modify existing ones if the manufacturers are made aware of a need. Involving manufacturers through the VCSB process removes any hint of preferential treatment towards any single manufacturer because participation in VCSB method development efforts are open to all parties.

Goal 2. Consistent Approach

Problem Statement

- As a result of the legislation passed from 1970 to 1980 the Agency ended up with a siloed organization with each EPA program office establishing their own method development and approval program. As the programs have matured and the matrices and analytes of concern have increased, the number of methods that laboratories are required to employ has expanded. Often different EPA programs have issued analytical methods that employ the same basic measurement technique but with slight differences. This has resulted in a loss of productivity, training problems, confusion on appropriate methods to use in a particular analysis, and additional opportunities for errors for the environmental laboratory community and confusion in the regulated community as to appropriate methodology to employ when conducting compliance monitoring.

Goal 2. Consistent Approach

Possible Solution

- EMC would establish a Task Group to review existing Agency monitoring methods and prepare a report that the EPA Program Offices can use to harmonize the method Quality Control requirements. The Task Group would look at developing consistent approaches for requirements such as instrument calibration and quality control based on the current best science.
- Example: Currently every method has its own calibration section which contains varying requirements and acceptance criteria. The EMC report could recommend a “Standard Instrument Calibration Practice” that every method could then reference. As this science improves, this one document could be updated without having to change all the other methods.

Goal 3. Reliable Data

Problem Statement

- Several recent reports have clearly demonstrated that implementing a Quality Management System (QMS) based on either ISO/IEC 17025 or an accreditation standard developed by The NELAC Institute improves the reliability of environmental monitoring data. EPA does not have the statutory authority to require laboratory accreditation other than for drinking water and many states rely on the EPA drinking water certification manual for their state program.

Goal 3. Reliable Data

Possible Solution

- Document examples of how implementing a national laboratory accreditation system would improve data quality and then demonstrate to members of Congress and EPA Senior Management the benefits of requiring all environmental compliance and regulatory development monitoring work be performed by accredited laboratories.

Summary

- In its short life, EMC has achieved significant accomplishments.
- The on-going collaboration with EPA has been fantastic.
- We welcome you to join as members or guests.

Contact EMC

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