



ASSESSING NEW EMERGING CONTAMINANTS & METHODS FOR ACCREDITATION

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With credit to NV5/Dade Moeller*

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TOPICS TO DISCUSS

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- Examples of methods for emerging contaminants
- Approaches to educate assessors
- What the assessor must do or understand

EXAMPLES OF METHODS FOR EMERGING CONTAMINANTS

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- Per-and Polyfluoroalkyl Substances (PFAS) Using External Standard Calibration and Multiple Reaction Monitoring (MRM) Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)
 - EPA 537.1 for drinking water
 - EPA 533 for drinking water
 - SW 846 8237
 - DOD QSM Appendix B Table B-15
- Determination of Cylindrospermopsin and Anatoxin-a in Drinking Water by Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS) -- EPA 545
- Method 546: Determination of Total Microcystins and Nodularins in Drinking Water and Ambient Water by Adda Enzyme-Linked Immunosorbent Assay (ELISA) –EPA 546

APPROACHES TO EDUCATE ASSESSORS

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- Read the method in detail
- Training classes typically do not exist for emerging contaminants
- Alternatives:
 - Learn the technology from vendors
 - Vendors often have webinars, online videos of usage
 - Examples of data
- Web searches from EPA
- EPA validation are often published

APPROACHES TO EDUCATE ASSESSORS

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- TNI is generating many training classes
- Visit a lab for your own training (not to do an official audit) to see the technology, ask question, pros/cons, issues in testing
- Labs may develop nuances to the process that are proprietary,
 - DO NOT disclose those to other labs,
 - Make sure these ‘approaches’ are still allowed by the method
- Make yourself checklists or print the method and mark areas to audit/data review

APPROACHES TO EDUCATE ASSESSORS

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- Mentoring
 - A person who is experienced can mentor a new assessor
 - Take a technical guru and have them work with you on audits
 - Remote audits make this possible with no added travel costs and minimal time
- Develop training data packages with issues and give it to new assessors to ID problems

WHAT THE ASSESSOR MUST DO OR UNDERSTAND

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- Set aside time to do your homework
- Discuss methods with those who are performing it or vendors before going
- Be aware of similarities & differences in prep & analysis
- Ask detailed questions
- Go from sampling & preparation to testing
- Understand that PTs may not be available or may be limited
- PT not made per TNI or ISO 17043 requirements
- Reference Materials available may not be ISO 17034
- May not have second source vendor, may only have second lot number

COMPARE PFAS METHODS

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Task	533	537.1
Solid Phase	PVDVB	SDVB
Elution	2% ammonium hydroxide	methanol
Reconstitution	20% H2O/MEOH	96:4 MEOH:H2O
	Focus short chain C4-12	
14 common analytes	11 unique analytes	4 unique analytes

COMPARE EPA 3512 / 8327 VS TABLE B-15 QSM 5.3

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- No SW846 solid extraction method
- QSM 5.3 Table B-15 widely accepted for soil, tissue, NP water but must develop extraction details
- Dilution vs SPE for water, Table B-15 requires use of entire sample
- All preparations must go through ENVI-carb™ clean up
- Quantify by isotope dilution vs internal standards added post extraction
- Benefits of isotope dilution, see EPA 533

GENERIC PFAS ISSUES

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- Contamination
- Finding matrices for ‘method blanks’ for solids, tissue
- Dedicated areas for extraction

EXAMPLE TRAINING APPROACH FOR EPA 546

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- MICROCYSTINS: A BRIEF OVERVIEW OF THEIR TOXICITY AND EFFECTS, WITH SPECIAL REFERENCE TO FISH, WILDLIFE, AND LIVESTOCK
- Training Process
 1. Read EPA 546
 2. Required YouTube viewings
 - Required View First: Required Viewing (PCR does not apply but the other items do apply)
<https://www.youtube.com/watch?v=Y9OdiogwYOM>
 - Required View Second: Required viewing: Abraxis video:
<https://www.youtube.com/watch?v=aTHxGUEG-1A>
 - Optional viewing: Generic how to perform ELISA:
<https://www.youtube.com/watch?v=Svoipyl6IRc>
 3. Review the SOP and generate three questions related to information that is missing or unclear to ask the lab.
 4. Take test below and email to Mitzi.MQC@gmail.com

- “total microcystins” are detected in finished water at or above 0.3 µg/L by EPA Method 546
- Do not confuse EPA 544 purpose with that of EPA 546.
- EPA 544 is not a confirmation of EPA 546
- EPA 544 measures occurrence of the six microcystin congeners, not total
- There are no ISO 17034 RMs available
- Vendor supplies the RM and PT, not ISO 17034 & not a TNI FOPT
- <https://abraxis.eurofins-technologies.com/home/services/proficiency-testing/>

SUMMARY

- Emerging contaminants are increasing in number and expanding environmental testing technologies
- Technologies used are often used in other areas such as pharma & biology.
- Assessors must **BE EXCITED TO LEARN** new things and ask good questions
- Use respected sources, spend some time learning the technologies that are not commonly used in environmental

Questions??

THANK YOU

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