



THE INSTITUTE REVIEW

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Milwaukee Metropolitan Sewerage District

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Article	Page
It's Time to Reserve Your Spot at the Forum	3
Welcome to Columbus, Ohio—January 2024	4
Environmental Measurement Symposium 2023.....	5
Summary of the 2023 Summer Forum on Environmental Accreditation	7
Nominations for 2024 Board of Directors	12
NEMC 2024 Call for Abstracts	14
National Environmental Monitoring Conference (NEMC) Dr. Charlie W. Carter Award	15
2023 Assessment Forum: The History of Accreditation.....	16
2023 TNI Mentor Session	18
EPA Updates from the Environmental Measurement Symposium.....	21
Status of TNI Standards Revision.....	28
TNI NEFAP EC Continues to Educate Field Sampling and Measurement Organization!	30
24th Edition of Standard Methods Now Available.....	32
Having a Strong Quality Management System Prevents Faulty Results	36
Ensuring Reliable Data.....	38
PFAS Drinking Water Fields of Proficiency Testing Coming Soon	40
Member Spotlight—Dorothy Love	41
ChairSpeaks — <i>"Musings from the TNI Chair"</i>	42
TNI Organizational Members	44

It's Time to Reserve Your Spot at the Forum

By Jerry Parr, TNI

We are pleased to invite you to the Forum on Environmental Accreditation, the principal conference for addressing policy and technical issues affecting the accreditation of environmental laboratories and other organizations involved in generating environmental data. The Forum will be held in Columbus, Ohio from January 22-25, 2024.

REGISTER NOW

The Forum will feature open public meetings of The NELAC Institute (TNI) committees to allow quality professionals, chemists, analysts, microbiologists, engineers, and managers from federal and state agencies; commercial, municipal, state and federal laboratories; and many others who are actively involved and interested in laboratory accreditation issues to review what has been done and participate in the efforts to establish a national program for environmental accreditation.

The 2024 Forum will include:

- Training courses on Conducting a Gap Analysis and Preparing for an Audit,
- Meetings of TNI committees,
- A mentor session,
- An assessment forum, and
- A general session with updates about TNI programs.

The Forum offers you an opportunity to participate in these sessions; to exchange ideas, findings, and recommendations; and to further TNI's efforts towards national accreditation.

All sessions and TNI meetings are open to all attendees according to your registration. Attendees can attend any session the week of January 22 in person and view recordings of any session you missed from January 29 to March 30, 2024. For those that do not plan to come to Columbus, you can view recordings of any session from January 29 to March 30, 2024. Registration is by full conference, which includes all events, or daily for the In-Person portion of the conference. For recordings-only registration, you may choose to register for the full conference or for selected days. The two training courses on January 25 are available In-Person only and do not have a recordings option. You may choose to only register for and attend a training course or add it on to your existing Forum registration.

We look forward to seeing you in Columbus!

For more information, visit the [conference website](#).

Welcome to Columbus, Ohio — January 2024

By Kelly Cravenor, EST Analytical

As you step into Columbus, Ohio, in January 2024, you're greeted by a city blanketed in a serene layer of snow, painting a picturesque winter scene. The city's warm-hearted embrace welcomes you to a world where rich history meets vibrant modernity.

Explore our renowned museums, such as the **Franklin Park Conservatory and Botanical Gardens**, where exotic flora bloom even in the midst of winter. Dive into the city's past at the **Ohio History Center**, where stories of pioneers and innovators come to life.



Embrace the cozy ambiance of our local cafes and restaurants, where you can savor warm, comforting dishes and mingle with friendly locals. Don't miss out on the thriving culinary scene, offering everything from innovative fusion cuisine to hearty comfort foods.

Take a leisurely stroll along the Scioto Mile, even in the winter chill. Admire the city's skyline and the serene flow of the Scioto River, offering a peaceful escape amidst the urban hustle.

January in Columbus is not just about indoor activities. Embrace the winter spirit with ice skating at the OhioHealth Ice Haus, where laughter mingles with the crisp air. Experience the thrill of winter sports at the nearby Mad River Mountain, where skiing and snowboarding enthusiasts carve through the snow-covered slopes.

For the art aficionados, the **Short North Arts District** is a haven of creativity, with galleries showcasing local talents. And, if you're a sports enthusiast, catch the excitement of a **Columbus Blue Jackets** hockey game, where the fervor of the fans is contagious.



Columbus, Ohio, in January 2024, is more than a destination. It's an experience of warmth in the winter cold, a blend of tradition and modernity, and a city that invites you to explore, indulge, and create lasting memories.

Enjoy your stay!

Environmental Measurement Symposium 2023

By Lara Phelps, US EPA

The 2023 Environmental Measurement Symposium was held in Minneapolis, MN from July 31 – August 3, 2023. For the nineteenth year, the Symposium consisted of a combined meeting of the 39th annual National Environmental Monitoring Conference (NEMC) and The NELAC Institute's (TNI) Forum on Environmental Accreditation. A total of 524 individuals attended the 2023 Symposium.

Symposium Summary

The 2023 Symposium featured nineteen NEMC technical breakout sessions with 88 oral and 31 poster presentations as summarized in the table below. These presentations are available for download at the [Symposium website](#).

NEMC Session Details

	Oral	Poster
Advances in Sensor Technologies	3	
Air Monitoring, Methods, and Technology	7	1
Analyzing Microplastics in the Environment	6	2
Applications in HRMS	4	1
Best Management Practices for Environmental Laboratories	5	
Collaborative Efforts to Improve Environmental Monitoring	6	
Crafting Consensus Methods	4	1
Drinking Water	9	3
Ensuring Reliable Data	6	
Environmental Forensics	6	
Laboratory Informatics	3	
New Organic Monitoring Techniques	10	3
Operational and Advocacy Issues	5	4
Polyfluoroalkyl Substances (PFAS) in the Environment	14	13
Shale Oil and Gas		1
Wastewater Surveillance		2

The 2023 Symposium also featured two keynote presentations and one general session with four presentations on the conference theme as summarized below.



Flush with Insight: The Future of Wastewater Surveillance

Adam Gushgari, Eurofins Pandemic Prevention Services

Successes of the DOD Environmental Laboratory Accreditation Program

Jordan Adelson, US Navy

A Full-CERCLE Approach: Community-Engaged Research Collaborative for Learning and Excellence

Alexa Dietrich, US EPA

Building Trust: Bridging the Gap Between Citizens and Government

Lily Tsai, Massachusetts Institute of Technology

Public and Stakeholder Engagement in Environmental Policy and Decision-making

Mahmud Farooque, Consortium for Science, Policy, and Outcomes - ASU Washington Center

Water AND Heat: Using Community Science to Address Hazard Bias

Janice Barnes, Climate Adaptation Partners

The TNI portion of the Symposium consisted of an Assessment Forum, a Mentor Session and twelve TNI committee meetings as summarized in another article of the issue of The Institute Review. As in previous years, the 2023 Symposium had an exhibit program with fifty-five exhibitors and an innovative new technology showcase with twelve organizations participating.

Summary of the 2023 Summer Forum on Environmental Accreditation

By Jerry Parr, TNI

This article summarizes committee meetings and other events that occurred at the 2023 Summer Forum on Environmental Accreditation, which was combined with the National Environmental Monitoring Conference (NEMC) under the umbrella of the Environmental Measurement Symposium. Almost 600 individuals participated in the 2023 meeting.

Any presentations made will be posted on the TNI conferences page in early November. The TNI Assessment Forum and Mentor Session will be available as a Conference Learning on the TNI website in December.

MONDAY, JULY, 2022

Chemistry Committee

Committee Chair: Michelle Wade, Pace Analytical Services

The committee has a number of work groups for the following topics:

- 1.4 /1.5 Method Selection and Method Validation
- 1.5 LOD/LOQ (Validation/Verification)
- 1.6 Demonstration of Capability
- 1.7.1 Calibration, including carving out an exemption for Ion-Selective Electrode (ISE) methods
- 1.7.2 Quality Control, 1.7.3 Data Acceptance, and 1.7.4 Sample Handling
- The committee anticipates having a draft standard by January 2024.

Quality Management Systems Expert Committee

Committee Chair: Debbie Bond, Alabama Power

The Quality Management Systems Committee develops a standard for the quality systems in environmental laboratories. The elements of the quality system include organizational structure, responsibilities, procedures, processes, and resources (e.g., facilities, staff, equipment) for implementing quality management in testing operations. Debbie Bond indicated the committee received feedback on updates from its work groups. The requirements for technical specialist was a brief summary which received little feedback. The definitions work group are agreed on 12 definitions and presented 2 others that need more work. These include acceptable language for internal audits, records retention, and transfer of ownership is still being worked on. Supplies and services and critical supplies and services are also being discussed.



TUESDAY, AUGUST 1

Assessment Forum: Internal Audits – 25 Years of Assessing Laboratories

Session Moderator: Judy Morgan, Pace Analytical Service

TNI's Assessment Forum was structured to provide an opportunity for laboratories and laboratory assessors to share information on how to improve the laboratory assessment process. The 2023 Forum included the following presentations:

- Evolution of the TNI Laboratory Accreditation Standard
- Morphology of Assessments - How Assessments Have Changed
- Experimenting with Quality

Microbiology Expert Committee

Committee Chair: Cody Danielson, Oklahoma DEQ

The Microbiology Expert Committee is responsible for Module 5 of the TNI laboratory accreditation standard. Cody said the committee is working on the response to comment for the draft standard and that attendees should watch for it to be posted. This round of comments was not contentious and positive feedback was received. Part five of the microbiology training course will be presented later in August; All have been recorded and will become available as a webcast after that. They've worked on implementation guidance for temperature distribution studies for water baths and incubators providing feedback on what that is. They are also working on equilibrium implementation guidance as this is something that has generated many questions over the course of years. They could use one non laboratory member to fill out the committee.

WEDNESDAY, AUGUST 2

Mentor Session – “Building Success as a Quality Manager in Four Easy Concepts”

Session Moderator: Dorothy Love, Eurofins Lancaster Environmental

Dorothy Love reported that it was attended by around 120 people and that many of them were first time attendees. The “Pacettes” honored Dorothy in song. Attendees were given a view of the future of the organization by experience based on having people sit down beginning with the most experienced in the audience. Presentations included:

- Traits and Skills of a Quality Manager – Where Do You Stand?
- Building Leadership and Communication Skills
- Building as a Researcher/Teacher
- Building and Identifying Your Team’s Skills
- Building Effective AB-Laboratory Relationships



Proficiency Testing Program Executive Committee

Committee Chair: Stacie Crandall, HRSD

The purpose of the Proficiency Testing (PT) Program Executive Committee is to establish and maintain a national PT program to support a national environmental accreditation program including establishing Fields of Proficiency Testing (FoPT). Stacie reviewed the committee's accomplishments, among them DMR QA and PFAS work. The committee has also worked on WET FoPT; PFAS drinking water limits; and SOP review. The committee feels there's a need for a webinar on the PT program training. The PTPAs did their annual presentation; it is a stable system without complaints and running well.

Proficiency Testing Expert Committee

Committee Chair: Kirstin Daigle, Pace Analytical Services

The Proficiency Testing Expert Committee develops and maintains consensus standards for proficiency testing that support TNI programs. Kirstin Daigle reported that all stakeholders were represented. They worked on evaluating/proposing the next revision of 4 Volumes including the 2 Laboratory Volumes, 1 PT Volume, and 1 PTPA Volume. They received feedback on the proposal. They plan to present Draft Standard Volumes Three and Four in Columbus. There is a proposal to change the requirements for supplemental PT in Volumes 1&2 that would be a substantive change.

THURSDAY, AUGUST 3

Laboratory Accreditation Body Committee

Committee Chair: Aaren Alger, Alger Consulting and Training

The Laboratory Accreditation Body Committee develops the standard for operation of laboratory accreditation bodies. Aaren reported that an update on the standard was presented. The comment period is closed, and they will begin reviewing the comments with hopes of presenting the draft standard in Columbus. Concepts and/or ideas for improving the evaluation process for ABs were discussed. They're hoping to get less redundancy and more value in the process. Among the options are abbreviated applications for the ABs; focus on performance and not procedures; a suggested list of key performance indicators regarding training, assessments, and reports; enhanced interviews of assessors. The Advocacy Committee suggested that some of the non-NELAP ABs may participate in order to see the work being done, help the effort, and potentially gain interest in joining.

Laboratory participation in the AB evaluation effort was shot down. Ilona commented that NEFAP and PT are writing a test to cover the standard and their SOP that would be self-taught. There could then be a half day of online discussion on the details of writing non conformances and what to look at during an assessment. This would limit things to a 1/2-day class as opposed to three days. Aaren said that assuring that ABs are trained is what the standard requires. This evaluation should not necessarily be of the laboratory's performance, but of the AB's performance.



Special Session on Field Sampling and Measurement

Session Moderator: Tracy Szerszen, Perry Johnson Laboratory Accreditation

Tracy said that they had a joint session with the Field Activities Committee. Scott has provided an overview of the standard for Field Activities. The Draft Standard for Volume 1 and Volume 2 is anticipated to be available in fall of this year. It should then be final early next year. They discussed training ideas for Field Activities. Tracy reported on the Virtual Field Conclave that was held for three days in June and was very successful. They would like to have a small session again in October; they are developing an agenda and timing of the sessions for release soon. They hoped to continue an annual session such as what was held in June as well.

THURSDAY, AUGUST 3

NELAP Accreditation Council

Council Chair: Kristin Brown, Utah DOH

The purpose of this program is to establish and implement a program for the accreditation of environmental laboratories. Kristin discussed a summary of AB issues in their meeting. Aaren Alger was invited to talk about the evaluation process proposal. This proposal began in LAB and was brought to the AC.

Laboratory Accreditation System Executive Committee (LASEC)

Committee Chair: Maria Friedman, California ELAP

The mission of the Executive Committee is to manage TNI's efforts in supporting a national program for the accreditation of environmental laboratories. Activities of the Committee include developing and establishing policies and procedures, interpretations, guidance documents, and any related tools used by accreditation bodies to implement NELAP. They focused on the SIR process and clarifying how it's done. They were happy that of 15 submittals in the past year only three were deemed valid.

TNI Training Committee

Committee Chair: Calista Daigle, Pace Analytical

The Training Committee develops and maintains a comprehensive training plan for TNI. Calista Daigle reported that the committee reviewed available courses and some that are in development. They displayed their LinkedIn page and the course catalog and we're looking for feedback on the catalog. They talked about exam questions and SOP feedback and how to develop tests.

TNI Credentials Committee

Committee Chair: Ken Brown, City of Escondido

Ken gave an overview on the shift from the Competency Task Force to the Credentialing Committee. There are membership needs so reach out to Ken if you are interested. They had discussions on QMS badges and the quality professional position. They're looking for feedback on which competencies should be addressed next, such as project management and evaluations.



Although the Asbestos and Radiochemistry committees did not meet, an update was provided on their activities:

- Bob Wyeth reported that the asbestos standard is final and that notifications have been sent to all interested parties. This revision is more reorganization than anything else.
- Ilona Taunton reported that the radiochemistry standard is also done. They are working with PTPEC on drinking water limits and these are completed. Next will be the uncertainty piece with PTEC. They're also looking at non potable water samples for PTs and will be looking for a sponsor once that is decided upon. They would like to do more training; they have a 40-hour course now, but would like a course for data users. Community members would be more able to come to the conference if a course like this were offered.

Nominations for 2024 Board of Directors

By Sharon Mertens, MMSD

The election for new Directors will begin soon and nominations for individuals to serve a three-year term on the TNI Board of Directors are now being accepted. TNI members may self-nominate or nominate another individual. There are up to six open positions for 2024.

TNI is governed by an elected Board, including five officers. Directors are responsible for decisions regarding TNI's goals, objectives, and allocation of resources. By law, Directors are obligated to

- 1) act only in the best interests of TNI and to avoid conflicts of interest;
- 2) act honestly, in good faith, and on an informed basis when making decisions; and
- 3) pursue the objectives of TNI's mission. TNI holds in high regard Directors who accept these obligations to serve as stewards of the organization.

Having a strong Board of Directors is vital to the strength and future of our organization. Our Board is balanced and has representation from all recognized stakeholder groups.

TNI's Board culture is characterized by full and open participation by all Directors. We believe that this approach maximizes group energy to address major issues facing our profession and organization. We rely upon diverse perspectives to reach well-informed decisions that further our mission. Our Board exercises strategic leadership through its focus on policy, direction, and strategy.

Qualifications for Directors

The Nominating Committee seeks candidates for the TNI Board of Directors who demonstrate strong leadership, commitment, and contributions to the field of environmental laboratory accreditation. We need candidates who have a broad knowledge and awareness of issues facing TNI and are willing to uphold TNI's mission, goals, priorities, and Code of Ethical Conduct.

Directors must demonstrate a commitment to TNI's priority to be a highly functioning organization that is continually enriched by its commitment to balance and inclusion, and must possess strong interpersonal skills with the ability to objectively consider various perspectives to guide major policy decisions.

In addition, Directors need to be able to make the necessary commitment of time and other resources to serve effectively as a Director and to serve as an effective ambassador for TNI and its principles.

Finally, a Director must be a current member of TNI.

These qualifications are designed to ensure that elected Directors are prepared to fulfill their designated responsibilities, including:



- exercising fiduciary responsibilities and stewardship with regard to TNI's goals, policies, and allocation of resources;
- contributing to a policy governance model that provides leadership for TNI with a focus on mission; and
- identifying and cultivating future leaders.

Time Commitments of Board Service

Directors are elected for a term of three years and are renewable. The Board meets by teleconference monthly and in face-to-face meetings, as necessary.

To maintain stakeholder balance, we are particularly looking for candidates from the “accredited organization” stakeholder groups. However, nominations from other stakeholder groups will be considered as we review all submittals.

Directors receive detailed agenda materials for study prior to each meeting. From time-to-time Directors may also volunteer or be asked to serve on committees that may conduct business by email, conference call, or additional meetings.

If you are interested in serving on the Board, please complete the TNI Board Nomination Form.

Special Note regarding Federal officials: Federal laws prohibit individuals that work for the Federal government from serving on a Board of a non-profit organization in a fiduciary capacity. This law has been interpreted differently by various Federal agencies, but for the sake of consistency, TNI has decided that any Federal official that wishes to serve on the TNI Board can only do so in an Ex-Officio role. Currently, three Ex-Officio Directors, representing the Department of Energy, Department of Defense, and Environmental Protection Agency serve on the TNI Board. If you are a Federal official and would like to serve on the TNI Board, please contact Sharon Mertens, the chair of the Nominating Committee, at SMertens@mmsd.com.

2024 Election Timeline

- November 20 – December 31, 2023 – Nominations accepted.
- January 2-12, 2024 – Nomination Committee will review the nominations and prepare a slate of candidates.
- January 15 – Voting opens with the announcement of the slate of candidates on the TNI website.
- February 15 – Voting closes.
- March 18 – Newly elected Directors assume office.

Finally, all TNI members have the opportunity and responsibility to vote to select the TNI Board of Directors.

NEMC 2024 Call for Abstracts

By Earl Hansen, TNI

Organized by The NELAC Institute (TNI), the 2024 Environmental Measurement Symposium is a combined meeting of the National Environmental Monitoring Conference (NEMC) and the Forum on Environmental Accreditation. It is the largest conference focused on environmental measurements in North America, and this year is planned as an in-person event for the week of August 5, 2024 in Garden Grove, CA. This year's Symposium theme is Reliable Data for Sound Decision Making. The Symposium Steering Committee is inviting abstracts for oral or poster presentations in these specific topic areas:

- Advances in Sensor Technologies for Environmental Monitoring
- Air Monitoring, Methods, and Technology
- Analyzing Microplastics in the Environment
- Automation and Innovation for Sample Preparation
- Best Management Practices for Environmental Laboratories
- Collaborative Efforts to Improve Environmental Monitoring
- Crafting Consensus Methods for Environmental Sampling and Measurement
- Drinking Water
- Emerging Environmental Applications for High Resolution Mass Spectrometry
- Ensuring Reliable Data
- Environmental Forensics
- Field and Mobile Laboratories
- Innovations in Microbiology
- Laboratory Informatics
- Metals
- New Organic Monitoring Techniques
- Optimizing Laboratory Operations
- Participatory Science
- PFAS in the Environment
- The Role of AI in Environmental Analyses

Please provide your abstract by February 1, 2024. Abstracts received after the deadline are not guaranteed to be reviewed due to the number of available time slots and the high number of quality and timely submissions received. More information and submission instructions are on the [Environmental Measurement Symposium website](#).

National Environmental Monitoring Conference (NEMC) Dr. Charlie W. Carter Award

By Lara Phelps, US EPA

Dr. Charles (Charlie) William Carter dedicated over 30 years to the environmental laboratory business and community. Considered a highly respected environmental testing genius by everyone fortunate enough to know him, he was brilliant and had relentless energy, work ethic, and passion for advancing the environmental testing industry by providing critical scientific expertise and support. Charlie was deeply involved in many environmental organizations and a frequent speaker at conferences, forums, and meetings. He was a leader in the industry and one you could count on always pushing the envelope to help the environmental measurement, monitoring, and laboratory community excel in meeting the highest levels of integrity and quality.



This award has been established to recognize a technically competent individual and leader in the environmental measurement, monitoring, or laboratory industry, embodying Charlie's strengths in scientific expertise, communication, and mentoring. One recipient will be selected annually and recognized at the National Environmental Monitoring Conference (NEMC) as part of the Environmental Measurement Symposium (Symposium) held jointly with the Forum on Laboratory Accreditation. The recipient will provide the Monday Keynote Address at the Symposium, receive free registration for the full Symposium, and be presented with the award in the year that follows the nomination.

Nominations will open on the first day of each year's Symposium and close on January 31st of the following year. Submissions must be made through the [Environmental Measurement Symposium website](#) and not exceed three 8.5 x 11 inch pages of single-spaced, standard twelve (12)- point type with one (1)-inch margins.

All nominations must include the nominee's name, affiliation, address, phone number, and email address, in addition to a written submission considering the following criteria:

1. What technically innovative and impactful contribution(s) has this individual made to the environmental measurement, monitoring, and/or laboratory industry?
2. How does this individual demonstrate their understanding of the technology and policy implications this (these) innovative and impactful contribution(s) have on the industry?
3. How does this individual communicate, mentor, and/or outreach throughout the community to share this (these) contribution(s)?
4. In what ways does this individual demonstrate their leadership by giving of themselves?
5. What professional organizational and/or community membership(s) does this individual hold in addition to leadership service within them?

Each nomination must also be accompanied by the name, affiliation, address, phone number, and email address of two nominators to complete the submission. Self-nomination is not permissible.

The NEMC Steering Committee, which is comprised of representatives managing the conference in addition to representatives from federal government, state government, laboratory community, and industry will serve as the independent review panel for award selection. The selected recipient and their nominators will be notified by March 15th of the award year.

2023 Assessment Forum: The History of Accreditation

By Ilona Taunton and Jerry Parr, TNI

The August 2023 Assessment Forum Session was a great success and was well attended. We decided after many years of concentration on assessment related issues and “hot topics” related to the TNI Standard, it was time to take a step back in time and look at the history of the environment.

The session began with Judy Morgan providing an **overview of environmental and industrial challenges** that spurred creation of early regulations around drinking water and occupational safety, eventually forming EPA and OSHA. The history covered disasters representing everything from air pollution so thick it turned day into night and improperly disposed hazardous waste to major oil spills and train derailments carrying PFAS. Many were well known, like “Love Canal” and the recent East Palestine spill, but others such as the Picher, Oklahoma chat piles, Times Beach, MO and the toxic chemical discharge into the Tom’s River in NJ were new to many. This background set the stage to represent the path from the past to why we are here today.



We were honored to have Jerry Parr provide his expertise and insight on the **regulatory landscape from the formation of EPA and OSHA** in the 1970’s to today. The coverage was every major regulatory program and how federal requirements for drinking water certification triggered different approaches for other programs from federal (DOD/DOE), state, and third party. These actions set the path to explore national accreditation, and Jerry showed the details of the timeline representing the leadership, challenges, and changes along the way. The most recent challenge was the need for remote assessments during the pandemic, and this was a great segue to the second half of our session.

Mitzi Miller kicked off the second half with a **“Morphology of Assessments”**, highlighting how assessments have changed to meet the needs of the introduction of a national standard and advancements in technology. She began with the original foundation set by the federal drinking water certification requirements and covered CLP, DOD, and the introduction and evolution of the NELAC/TNI standard. A focal point was how technology has led us from manual and lengthy review to a forced development of successful remote assessments that was necessary during the pandemic. The conclusion showed that the industry is resilient and collaborative to meet the needs of the laboratory community and successful path forward must always include innovation and creativity.

Dorothy Love wrapped up the session with **“Experimenting with Quality”** and showed how the quality function has adapted to the challenges and changes pointed out by Mitzi, by representing how the quality system



functions have reset many times to meet new needs. Her main focus was to show the strong foundation set by the TNI standard and the need for every Quality Manager/Leader to change, experiment with new processes to meet the need, and consider the factors such as end user needs to continue to strengthen and grow a suitable and robust QA program. The presentation prompted attendees to share thoughts and experiences that resulted in enlightenment for all who attended.

A recording of this session will be archived as a “Conference Learning” on the TNI Education Delivery System webpage at: <https://www.nelac-institute.org/content/eds-home.php> in early November. Adobe Acrobat PDF files of each presentation will also be available on the Previous Conferences webpage at: <https://www.nelac-institute.org/content/meetings-prev.php> in November.

2023 TNI Mentor Session

By Judy Morgan, Pace Labs and Dorothy Love, Eurofins US

The August 2023 Mentor Session was another resounding success with a standing room only crowd of 120 plus attendees. The Mentor team (Dorothy Love, Valerie Slavin, Calista Daigle) wanted to focus this session on providing information and tools to those who are newer in their QA roles or are looking to enhance their skills. As such, each presentation was centered on “Building” skills.

We started with a Bingo game for each attendee to do a self-assessment of the skills that they, and their team, have or lack. We populated the Bingo cards with skills we saw as essential to QA staff, such as Negotiator, Researcher, Adaptable, Multitasker, Decisive, Calm, and many more (Bingo Cards can be found on pages 2 and 3 of this article).

This was followed by presentations on building leadership and communication skills, always an important trait for QA; and building your skills as a teacher and researcher, which is key in our industry considering how much information exists and how often things change. The next topic covered things to consider when building your team, addressing cross generational challenges, and identifying key skills within the team.

The next part of the session was a surprise presentation by the “Pacettes” (Judy Morgan, Valerie Slavin, Calista Daigle) with a tribute to Dorothy Love as she is “graduating” from her tenure as chair of the session.

The final presentation was from Dorothy and covered building relationships between the labs and ABs. The focus was on the need to be involved in our industry decisions, committees, etc. and that we all need to collaborate and “be in the room where it happens” as we move forward.





Quality Manager Skills

B I N G O

Detail Oriented	Strong Communicator	Arbitrator	Listener	Technical
Knowledgeable	Self-Confident	Respectful	Problem Solver	Researcher
Open Minded	Big Picture View	Leader	Learner	Committed
Calm Demeanor	Mentor	Compassionate	Decisive	Multitasker
Strategic thinker	Negotiator	Resourceful	Relationship Builder	Adaptable

Quality Manager Skills

B I N G O

Multitasker	Open Minded	Arbitrator	Strong Communicator	Calm Demeanor
Big Picture View	Listener	Strategic thinker	Committed	Technical
Resourceful	Learner	Leader	Relationship Builder	Problem Solver
Adaptable	Negotiator	Decisive	Compassionate	Self-Confident
Detail Oriented	Respectful	Mentor	Knowledgeable	Researcher

Quality Manager Skills

B I N G O

Negotiator	Calm Demeanor	Compassionate	Decisive	Arbitrator
Learner	Researcher	Adaptable	Mentor	Strong Communicator
Self-Confident	Technical	Leader	Knowledgeable	Detail Oriented
Relationship Builder	Committed	Open Minded	Big Picture View	Problem Solver
Resourceful	Multitasker	Strategic thinker	Listener	Respectful

Quality Manager Skills

B I N G O

Strategic thinker	Learner	Researcher	Technical	Compassionate
Arbitrator	Committed	Self-Confident	Respectful	Decisive
Listener	Detail Oriented	Leader	Relationship Builder	Adaptable
Calm Demeanor	Negotiator	Problem Solver	Knowledgeable	Mentor
Big Picture View	Resourceful	Multitasker	Strong Communicator	Open Minded



Quality Manager Skills

B I N G O

Problem Solver	Detail Oriented	Compassionate	Calm Demeanor	Technical
Negotiator	Big Picture View	Researcher	Adaptable	Respectful
Arbitrator	Strategic thinker	Leader	Relationship Builder	Mentor
Listener	Self-Confident	Multitasker	Strong Communicator	Learner
Decisive	Resourceful	Open Minded	Knowledgeable	Committed

Quality Manager Skills

B I N G O

Detail Oriented	Problem Solver	Arbitrator	Mentor	Technical
Calm Demeanor	Strong Communicator	Resourceful	Committed	Multitasker
Researcher	Self-Confident	Leader	Respectful	Strategic thinker
Knowledgeable	Negotiator	Listener	Decisive	Compassionate
Learner	Adaptable	Open Minded	Relationship Builder	Big Picture View

Quality Manager Skills

B I N G O

Multitasker	Self-Confident	Adaptable	Knowledgeable	Big Picture View
Open Minded	Strong Communicator	Compassionate	Researcher	Mentor
Technical	Strategic thinker	Leader	Detail Oriented	Respectful
Negotiator	Learner	Problem Solver	Committed	Relationship Builder
Arbitrator	Calm Demeanor	Decisive	Listener	Resourceful

Quality Manager Skills

B I N G O

Negotiator	Knowledgeable	Committed	Strategic thinker	Adaptable
Resourceful	Detail Oriented	Problem Solver	Relationship Builder	Strong Communicator
Big Picture View	Multitasker	Leader	Arbitrator	Compassionate
Technical	Respectful	Mentor	Calm Demeanor	Decisive
Learner	Researcher	Listener	Open Minded	Self-Confident

EPA Updates from the Environmental Measurement Symposium

By Jerry Parr, TNI

On August 3, 2023, as part of the Environmental Measurement Symposium, the Environmental Protection Agency (EPA) provided updates from the RCRA, CWA, and SDWA programs. The presentations will be available in early November to download at the [Symposium website](#).

SAFE DRINKING WATER ACT PROGRAM

Analytical Methods – Ongoing Work on PFAS

- ◆ Online SPE LC-MS/MS
 - ⇒ Automated SPE incorporating the extraction into the analysis
- ◆ Direct Injection LC-MS/MS (draft Method 534 #)
 - ⇒ High throughput method using modern instrumentation that would eliminate the need for SPE
- ◆ EPA Method 537.1/533 revisions
 - ⇒ Optimizing methods for classes of PFAS
 - ⇒ Increasing target analyte lists based on standard availability or analytical feasibility

** Note: Though method numbers are assigned to these draft drinking water methods, they have not been published as method development is on-going.*

“Total PFAS” Approaches for Drinking Water

- ◆ “Total organofluorine” method for drinking water has potential as a screening tool to identify PFAS that targeted methods do not address; applicability to drinking water monitoring needs further investigation
- ◆ Meaningful quantitation at low levels of interest for DW is very challenging
- ◆ Adsorbable Organic Fluorine (AOF) analysis
 - ⇒ Detection limits on the order of single parts per billion based on 100 mL sample; loss of hydrophilic PFAS from GAC at larger sample volumes
 - ⇒ Sensitivity significantly impacted by background fluorine, highly variable
- ◆ Extractable Organic Fluorine (EOF) analysis
 - ⇒ Detection limits on the order of hundreds of parts per trillion based on 500 mL sample
 - ⇒ EOF procedure takes much longer than AOF, nitrogen evaporation of extract may cause loss of some PFAS
- ◆ On-going discussions among technical experts to review “total PFAS” prospects

Other Analytical Method Development Work

- ◆ Expanding the application of LC/MS/MS
 - ⇒ LC/MS/MS Endothall and Glyphosate
- ◆ draft Method 561 #



- ◆ LC/MS/MS Paraquat and Diquat draft Method TBD
- ◆ GC/MS urethane and methyl-2-pyrrolidone draft Method 558 #

** Note: Though method numbers are assigned to these draft drinking water methods, they have not been published as method development is on-going.*

Drinking Water Method Update Rule (DW MUR)

- ◆ Action Development Process (ADP) tiering completed
Tier 3 - consistent with recent CWA WW MURs
- ◆ EPA Regulatory Development Work Group formed including representation from OW, ORD, OLEM, OGC and EPA Regions.
- ◆ Timeline: Proposed MUR by mid-2024, Final MUR by late 2026
- ◆ Goals:
 1. Transfer methods approved under the Expedited Method Approval process from 40 CFR Part 141, Appendix A to Subpart C, to the appropriate regulatory method tables within the referenced regulation;
 2. Remove methods that are obsolete or do not meet the technological or quality standards of more recent compliance monitoring analytical methodology
 3. Clarify and correct language and tables in 40 CFR Part 141 that are associated with drinking water analytical methodology or the analysis of drinking water contaminants and water quality parameters

Unregulated Contaminant Monitoring Rule (UCMR) 5

- ◆ Used to collect data for contaminants that are suspected to be present in drinking water and do not have health-based standards set under the Safe Drinking Water Act (SDWA)
- ◆ UCMR 4 (2017-2021) completed– data available at: <https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#4>
- ◆ UCMR 5 final rule published December 2021 (86 FR 73131)
- ◆ Monitoring for 30 chemical contaminants at the Entry Point to the Distribution System
 - ⇒ 29 PFAS and lithium
- ◆ Methods: EPA 533, EPA 537.1, EPA 200.7/SM 3120B/ASTM D1976-20
- ◆ UCMR 5 sampling period 2023 – 2025
- ◆ UCMR 5 includes many more small PWSs than in prior UCMR cycles
 - ⇒ ~6000 small PWS (vs. 800 small PWS in previous cycles), subject to availability of appropriations (to fund monitoring at small PWSs) and sufficient laboratory capacity
 - <https://www.epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule>
- ◆ Labs need to be certified to analyze one or more drinking water compliance monitoring parameters to apply for EPA approval to support UCMR 5
 - ⇒ Qualify and participate in PT studies offered by EPA
 - ⇒ Demonstrate capability to perform methods for which approval is being sought.



- ◆ Laboratories approved for UCMR 5 analyses: <https://www.epa.gov/dwucmr/list-laboratories-approved-epa-fifth-unregulated-contaminant-monitoring-rule-ucmr-5>
- ◆ EPA will soon update the Agency's webpage with the first set of UCMR 5 results and publish a "Data Summary," which will then be updated approximately quarterly.
- ◆ The Data Summary will include the results at a national level (e.g., the number of PWSs with results above the MRL and above health-based reference concentrations).
- ◆ National occurrence data are publicly available at: <https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule>.

CLEAN WATER ACT PROGRAM

Adsorbable Organic Fluorine (AOF) Draft Method 1621

- ◆ Increasing demand for aggregate methods like AOF
- ◆ Naturally occurring organofluorines are rare
- ◆ Collaborated with ASTM D19 and EPA ORD on single-laboratory validation of AOF screening method
- ◆ Single-Laboratory Validation Included:
 - ◆ Calibration and sorbent testing
 - ◆ Recovery ranged from about 40-200% for analytes tested:
 - ◆ Method detection limit of 3 ppb
 - ◆ Ten wastewater and surface water matrices were tested at two spike concentrations
- ◆ Draft method and single laboratory validation report: <https://www.epa.gov/cwa-methods/cwa-analytical-methods-and-polyfluorinated-alkyl-substances-pfas>
- ◆ Study Plan finalized
- ◆ Recruited 6 contract laboratories and 5 volunteer laboratories
- ◆ 9 Laboratories have successfully completed calibration and initial demonstration of capability
- ◆ Analysis of 9 wastewater and surface water matrices currently underway
- ◆ Anticipate finalizing the method in 2023

Validation of Method 1633 for PFAS

- ◆ Solid-phase extraction isotope dilution method
 - ⇒ Based on an SOP originally developed by SGS AXYS
 - ⇒ DoD is funding and managing both single and multi-laboratory validation studies of the method, EPA OW and OLEM are providing review
 - ⇒ The goal is to provide EPA OW with the documentation needed to consider publication of this method as a CWA method. OLEM plans to also leverage the validation data to support an SW-846 method.
 - ⇒ Test matrices: wastewater, surface water, groundwater, landfill leachate, soil, sediment, biosolid, and fish tissue (includes shellfish)
- ◆ Single-Laboratory Validation Completed
- ◆ Draft Method 1633 and single laboratory validation study report are both posted: <https://www.epa.gov/cwa-methods>



Multi-Laboratory Validation of 1633

- ◆ Includes 10 participant laboratories, referee laboratory, data validators, and statisticians
- ◆ All laboratory analyses have been completed, and data packages have been received and reviewed
- ◆ MLV Report for aqueous samples (WW, SW, GW) published on EPA and DoD websites July 2023
- ◆ Currently reviewing data, performing statistical analysis, and writing the multi-laboratory report for remaining matrices
- ◆ Draft 4 released July 2023 contains final aqueous QC criteria
- ◆ Final method anticipated in late 2023

1633 Pooled MDL (40 analytes x 10 laboratories = 400 MDLs)

- ◆ 27 of 40 below 1 ng/L
- ◆ 6 between 1 and 2 ng/L
- ◆ 3 between 2 and 3 ng/L (6:2 FTS, 8:2 FTS, and 3:3 FTCA)
- ◆ 4 between 3 and 10 ng/L (NMeFOSE - 3.8, NEtFOSE - 4.8, 7:3FTCA - 8.7, and 5:3FTCA - 9.6)

1633 Ongoing Precision and Recovery (OPR) and Low-Level OPR (LLOPR)

- ◆ The performance was about the same for the OPR and LLOPR, so the data were combined and used to develop a single set of criteria
- ◆ Most criteria are inclusive of the highest and lowest observed data point from all 10 laboratories
- ◆ No criteria are more stringent than 70-130%
- ◆ Lowest lower acceptance limit was 50%, highest upper acceptance limit was 160%

1633 Extracted Internal Standards

- ◆ Single set of EIS criteria made from only matrix samples (no blank spikes)
- ◆ Roughly 700 sample results per EIS, from 10 laboratories
- ◆ Used a non-parametric approach (p1 and p99) and professional judgement (e.g., eliminate the EIS compound recoveries from 1 to 2 laboratories for a specific parameter)
- ◆ No criteria are more stringent than 40-130%
- ◆ Lower Limits: 15 at 40%, 1 at 30% (13C7-PFUnA), 1 at 25% (D5-NEtFOSAA), 6 at 10% (13C2-PFDoA, 13C2-PFTeDA, D3-NMeFOSA, D5-NEtFOSA, D7-NMeFOSE, and D9-NEtFOSE), and 1 at 5% (13C4-PFBA)
- ◆ Upper Limits: 17 at 130%, 3 at 135%, 1 at 170% (D3-NMeFOSAA), 2 at 200% (13C2-4:2FTS and 13C2-6:2FTS), and 1 at 300% (13C2-8:2FTS)

608.1, 624.1, and 625.1 QC Criteria Update

- ◆ TNI, ACIL, APHL, and WEF have volunteered to provide data to update QC criteria
 - ⇒ Initial calibration, MDLs, calibration verification, ongoing precision and recovery, surrogate recovery, MS/MSDs



- ◆ Secondary Data Collection
 - ⇒ Use existing data anonymously
 - ⇒ Volunteer laboratories
 - ◇ Perform NPDES compliance monitoring
 - ◇ Have an SOP and formal quality system
 - ⇒ Coordinate with laboratory associations
- ◆ Over 20 laboratories recruited
- ◆ Currently beta testing electronic deliverable

Revision to EPA Method 900.0 for Gross Alpha and Beta

- ◆ OGWDW approved a revision in 2018 for drinking water at 40 CFR 141.66(c)
- ◆ Clean Water Act approved EPA method for Gross Alpha Beta is the original Method 900.0 published in 1980
- ◆ Plan to evaluate the performance of the method in wastewater with high total dissolved solids (TDS)
- ◆ Study plan finalized and we have recruited volunteer labs
- ◆ Testing ongoing

Continuous Compliance Monitoring

- ◆ Total residual chlorine pilot study
- ◆ Based on EPA Drinking Water Method 334.0
- ◆ Hampton Roads Sanitation District's (HRSD) SOP for Online Total Residual Chlorine Analysis approved as a limited use ATP by VA DEQ for compliance analysis of total residual chlorine (TRC) in the contact tank to meet VPDES permit requirements.
- ◆ Collaborating with Standard Methods Joint Task Group to develop an approach for validating the calibration and measurements resulting from online analyzer technology

6-PPDQ Single Laboratory Validation

- ◆ University Washington Publication (Science, December 2020)
- ◆ Widespread occurrence of 6-PPDQ at concentrations toxic to salmon
- ◆ Method Team: EPA OW, EPA R10, and Eurofins Sacramento
- ◆ Eurofins Sacramento SOP: Strata XL cartridge, acetonitrile elution, LC/MS/MS analysis with extracted and non-extracted internal standard (13C12-6PPDQ and D5-6PPD-Q)
- ◆ Validation Study
 - ⇒ Calibration Study
 - ⇒ Stability/holding time study
 - ⇒ Initial Demonstration of Capability
 - ⇒ Testing of 3 stormwaters and 3 surface waters (low and high spike)



Acrolein and Acrylonitrile Holding Time and Preservation

- ◆ At 40 CFR Part 134.3(e) Table II, acrolein and acrylonitrile have a different preservative requirement than the rest of the analytes in Method 624.1 (pH of 4-5 instead of a pH of ≤ 2)
- ◆ The Environmental Monitoring Coalition (EMC) led a holding time study determine how long these 2 analytes would remain stable if they were preserved at pH ≤ 2
- ◆ EPA reviewed and agreed to the study plan and then reviewed the resulting data and study report
- ◆ EPA OW plans to propose a change to the preservation requirement at 40 CFR Part 136.3 for acrylonitrile and acrolein to a pH of ≤ 2 during the next Full MUR

RESOURCE RECOVERY AND CONSERVATION ACT PROGRAM

Method 1340 – In Vitro Bioaccessibility Assay for Arsenic in Soil

- ◆ SW-846 Method 1340 for Lead in Soil published in 2017
- ◆ Used to estimate relative bioavailability in ingested soil
- ◆ Validation study for lead and arsenic is complete, round-robin study report written
- ◆ Collecting reference material data EPA labs have generated since validation study
- ◆ Management review
- ◆ Propose for public comment
- ◆ Anticipated release: Early 2024

Method 3050B – Acid Digestion of Sediments, Sludges and Soils

- ◆ Single digestion for ICP-OES and ICP-MS
- ◆ Add HCl early in digestion process
- ◆ Take advantage of ICP-MS polyatomic interference reduction technology
- ◆ Observed improved recovery of antimony in solid reference materials
- ◆ More efficient, less waste
- ◆ Anticipated release: Fall 2023

ASTM Collaboration: Flash Point Test Methods

- ◆ Interlaboratory studies for D8174-18, D8175-18
- ◆ Modernizing Ignitable Liquids Determinations rule finalized in 2020, incorporated D8174 and D8175: RCRA ignitability characteristic regulation
- ◆ Based on ASTM D3278-78 (Small scale closed cup), D93-79/D93-80 (Pensky-Martens)
- ◆ ASTM standards D8174-18, D8175-18
- ◆ ORCR published [Modernizing Ignitable Liquids Determinations](#) rule in June 2020
- ◆ Standards procured for interlaboratory studies, ready to ship
- ◆ Planning with ILS committee
- ◆ Interlaboratory study anticipated to begin in fall 2023



SW-846 Organic Methods Updates: PFAS

- ◆ ASTM collaboration with EPA on interlaboratory study for D8421-22
- ◆ Revise 3512A, 8327A:
- ◆ Add target analytes, performance data, chromatography conditions, isotope dilution calibration

Planned new/revised SW-846 PFAS analytical methods:

- ◆ 3536: Solid Phase Extraction using Weak Anion Exchange (Aqueous)
- ◆ 3551: Equilibrium basic solvent extraction (Solids)
- ◆ 3670: Non-porous graphitized carbon cleanup

Additional Methods and Activities

- ◆ 5035A: Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples
 - ⇒ Incorporate reference to frozen holding time study in ASTM D6418 research report
- ◆ 8015D: Non-halogenated organics using gas chromatography/flame ionization detection (GC/FID)
 - ⇒ Add light hydrocarbons, validation study initiated by Environmental Standards, Inc.
- ◆ 8330B: Nitroaromatics, Nitramines, and Nitrate Esters by High Performance Liquid Chromatography (HPLC)
 - ⇒ Add insensitive munitions, validation study initiated by DoD
- ◆ Chapter 4: Organic Analytes
 - ⇒ Revise sample preservation and holding time criteria for acrolein and acrylonitrile, stability study initiated by the Environmental Monitoring Coalition

Status of TNI Standards Revision

By Paul Junio, Pace Labs

All four volumes of the TNI Laboratory Accreditation Standards are under revision right now. A summary of the revision status is provided below. Please keep in mind that, while these standards are under revision, they will NOT become the Standard that we all follow until they have been approved by the NELAP accreditation council AND have been approved by the various state governing bodies in their regulations.

With that in mind, here is a summary of where the process is for the assorted committees:

Asbestos: Module 3 was approved by the Asbestos Committee on 10/20/22. The Module was posted to the TNI website 7/25/23. A webinar on the revised Standard is being planned. This Module is complete.

Chemistry: The Chemistry Committee is reviewing the recommendations of the Work Groups that were formed to begin the revision process. Once those recommendations have been acted upon, the Committee will commence their complete review of the Standard to create a Draft Standard. Comments were received at the Conference in Minneapolis, and those will be included in the discussion. Previous SIRs are also being reviewed as potential sources of revision information. The Committee hopes to have a Draft Standard ready for review in Columbus.

Field Activities: The Field Activities Standard is nearing completion of its Draft. The committee is performing a final review as the work done by various members of the committee is combined into the Draft. The Standard should be posted for comment in advance of the Forum in Columbus and available for discussion at that meeting.

Laboratory Accreditation Body: Certain commenters have been invited to speak to the committee in hopes of resolving those comments. They have been invited to meetings in September through November. The Committee hopes to finish their response to comments by the end of year, and then present a draft at the Forum in Columbus. This plan depends on how long the discussion goes for comments and the need for a quorum at each meeting.

Microbiology: The Committee has responded to all comments that were received on the Draft Standard. Since some of them were ruled persuasive, a revised Draft Standard will be prepared. The Committee is waiting to begin work on their revised Draft Standard following the posting of their Response to Comments document. A Draft Standard might be available for discussion at the Forum in Columbus.

Proficiency Testing: Volumes 1 and 2 of the Proficiency Testing Standard are being temporarily tabled so that the Committee can focus on Volumes 3 and 4. There is less work expected to be done on these two Volumes, so they are the current focus. Once completed, the work on Volumes 1 & 2 will resume.

Quality Management Systems: Multiple work groups have focused on specific items, such as definitions and specific language that has been problematic in the past. Those work group tasks have been completed. The



committee is now reviewing past SIRs to determine if any need to be addressed by revising language in the Standard. Once that step is complete, the committee will review their working document in its entirety to submit it as a Draft Standard. The committee will have their working document for discussion at the Forum in Columbus.

Radiochemistry: Module 6 was finalized 1/6/22 with posting its to website. No persuasive comments were received, and the Response to Comments was posted 1/26/23. This Module is complete.

WET: The committee continues to work on Module 7. Focus has been an individual sections of the Module that have been identified as being most in need of revision. The Technical Requirements section is the last remaining part under discussion. Definitions that may be specific to WET are also under review.

TNI NEFAP EC Continues to Educate Field Sampling and Measurement Organizations!

By Tracy Szerszen, Perry Johnson Lab Accreditation and Ilona Taunton, TNI

Due to the 1st TNI Field Sampling Conclave being a success, the TNI NEFAP EC has decided to continue with educating the field sampling industry through additional webcast training sessions.

The next conclave will be held **February 7, 2024, 10:00 am — 4:00 pm EST.**

Lessons Learned from sampling and analysis of PFAS in Field Blanks

Guidance published by the US EPA, the Department of Defense, and several states indicate many precautions should be taken when collecting samples and field blanks are an essential component of the analytical workflow. Now that thousands of field blanks have been analyzed, is there any data to support this costly endeavor?

This training session will explore best practices for sampling drinking water and wastewater for PFAS and the analysis of the associated field blanks including discussions:

- Is there any evidence that all of the precautions such as clothing, makeup, sunscreen, and food are required to minimize false positive results?
- Is there any evidence that shows such precautions are not required?
- How prevalent are PFAS in field blanks?
- How do laboratories analyze their work flows to process field blanks in the most expeditious manner?

Following the presentations, the presenters will come back together as a panel to discuss best practices for sample water for PFAS and analysis of field blanks. The presentations and summary of the panel discussion will be provided to key regulators to give them input into modifying their guidance.

Currently, TNI is looking for presenters for this session. Please provide your interest to Ilona Taunton ilona.taunton@nelac-institute.org by November 17th. **Abstracts will be due by December 15th and Final Presentations by January 17th.**



TNI's Executive Director, Jerry Parr presented at the OELA Annual Environmental Lab Conference on September 7, 2023, during the Field Session to educate on TNI NEFAP and the benefits to becoming accredited. [Click here to view the presentation.](#)

THE INSTITUTE REVIEW

November 2023

TNI NEFAP EC Continues to Educate... cont.



TNI NEFAP EC will be presenting at the Florida Society of Environmental Analysts (FSEA) 2023 Fall Conference on November 8, 2023, from 3:15-4:00 p.m. Michael Shepherd, Shepherd Technical Services will be presenting on Using NEFAP FSMO Accreditation to Help Comply with FL-DEP Sampling Rules. [Click here for more information.](#)

We look forward to continuing our educational efforts through TNI courses, public sessions, and social media! TNI NEFAP EC is always looking for feedback on field sampling and measurement educational topics. Please feel free to contact Tracy Szerszen TNI NEFAP Chair at tszerszen@pjlabs.com or Illona Taunton at ilona.taunton@nelac-institute.org to share your thoughts!

24th Edition of Standard Methods Now Available

By William Lipps, Shimadzu Scientific Instruments

The new Standard Methods for the Examination of Water and Wastewater, 24th edition, provides the most up-to-date, comprehensive resource for measuring the biological, chemical, and physical attributes of waters, and offers guidance for choosing among available methods for specific elements and compounds. Analysts, researchers, and regulators have relied on this expert consensus publication since 1905, and it remains a trusted source of accurate, proven methodology for analyzing natural waters, water supplies, and wastewaters.

In the 24th edition, more than 90% of methods were revised to clarify procedures, update nomenclature, and ensure consistency. Four entirely new sections provide much-needed information on biological toxin analysis, the determination of hydrogen peroxide and peracetic acids, and the detection of *Naegleria fowleri*. This edition also boasts a major reorganization in three parts, making methods easier to access.

Published by the American Public Health Association, American Water Works Association, and Water Environment Federation, the 24th edition is the culmination of thousands of hours of volunteer effort by experts in the field of environmental water analysis.

Updates to the new 24th edition include:

- 10 new or updated methods across Part 7000 Radioactivity
- 11 new or updated methods in Part 4000 Inorganic Nonmetallic Constituents
- 45 new or updated methods across Part 9000 Microbiological Examination
- 4 new sections (9750 *Naegleria fowleri*; 4500-H₂O₂ Hydrogen Peroxide; 4500-PAA Peracetic Acid; 10110 Algal Toxin Analysis: MC and NOD)
- 82 new or updated methods in total

Some laboratories have raised a concern about the ability to purchase something other than the newest version of a method from Standard Methods, as only the most recent version appears to be available when a single-method purchase is attempted, and this may not be the “approved” version. Once the purchase is made (of the version showing), the buyer can then choose an earlier method instead (assuming it is available in pdf), without paying an additional fee. Unfortunately, there is presently no way for a laboratory to know this, as it is not described on the website, but the issue will be fixed online in the near future.

Below is a summary of a presentation on the 24th edition provided at the 2022 Environmental Measurement Symposium. The presentation can be downloaded at: <https://apps.nelac-institute.org/nemc/2022/docs/presentations/pdf/8-3-22-Collaborative%20Efforts%20to%20Improve%20Environmental%20Monitoring-13.06-Lipps.pdf>



Style and Format

- “Easy to read format”
- Method approval year at top
- Footnotes incorporated into text
- Remove manufacturer specific instructions

Part 1000

- Collection and preservation tables clarified
- QA requirements updated, especially related to MDL

Part 2000 – Physical and Aggregate properties

- Editorial updates
- Edits to procedural issues based on feedback from users

Part 3000 – Metals

- Restructured to show metals alphabetically
- Interference correction revised in 3125 (ICPMS)
- 3500-As revised to address new EPA MSL
- Other edits and corrections

Part 4000 – Inorganic Non-Metals

- 4500-Cl revised to remove sulfur interferences
- 3 new cyanide methods using gas diffusion amperometry for total, available, and free cyanide
- New methods for peracetic acid (4500-PAA) and hydrogen peroxide (4500-H2O2)
- 4500-N updated to include new method for total N using catalyzed redox reaction and chemiluminescence
- New Method 4500 NO3 J based on enzymatic reduction
- Significant changes to 4500 H+ for calibration and temperature correction
- 4500-P revised to allow for a 28-day holding time

Part 5000 – Aggregate Organic Constituents

- 5220 (COD) revised to update references, clarify procedural steps, and update QA/QC requirements
- Method E added to 5310 (TOC) and other corrections to the other sections

Part 6000 – Individual Organic Compounds

- 6040 renamed Taste and Odor Compounds
- 6040 D allows smaller sample volumes
- Many methods revised to allow for capillary columns



Part 7000 – Radioactivity

- 7110, 7120, and 7510-3H revised to include the underlying rationale for various procedural steps.
- Calculations now include combined standard uncertainty, expanded uncertainty, critical level, and minimum detectable concentration.
- 7120 revised to include more details about gamma spectrometry, software, and QC.
- Introduction to 7500-Sr includes more background.
- New Method 7110 E allows for pulse-height/shape discrimination that permits simultaneous determination of gross alpha and gross beta in a single count.
- Other corrections to some of the calculations used.

Part 8000 – Toxicological Assessment

- 8050 (Bacterial Bioluminescence) updated.
- 8080 (Sediment Pore Water Test) updated to more fully describe sediment collection and storage, to outline ex situ and in situ methods for porewater extraction, and to better outline the confounding factors when testing for toxicity and when interpreting the results.
- All methods were updated relative to the names of test organism.

Part 9000 – Microbiological

- Laboratory Apparatus (9030) was substantially revised to clarify and update the specifications for laboratory equipment and to add a section for PCR equipment.
- Washing Labware (9040, formerly Washing and Sterilization) incorporates multiple updates to the processes necessary for washing, disinfecting, sterilizing labware.
- Preparation of Media and Buffered Dilution Waters (9050, formerly Preparation of Culture Media) has undergone a substantial rewrite with specific guidance regarding the preparation of media and buffered dilution waters.
- Stressed, Injured, or Viable but Nonculturable Bacteria (9212, formerly Stressed Microorganisms) was revised to update information on bacteria in the viable but nonculturable state and the effect of the presence of these bacteria on method selection.
- Recreational Waters (9213) was updated to provide a new method for detecting *Pseudomonas aeruginosa* using a substrate enzyme test.
- Heterotrophic Plate Count (9215) revised.
- The introduction of Biodegradable Organic Carbon (9217, formerly Assimilable Organic Carbon) was updated.
- Aerobic Endospores (9218) was updated with significant changes to the membrane filter technique and the references pertaining to that method.
- Membrane Filter Technique for Members of the Coliform Group (9222) was substantially updated to revise and clarify procedures.
- Detection of Coliphages (9224) was substantially revised to remove outdated sections B, C, and D. New methods 9224 G (Commercial Procedures—Fast Phage), and 9224 H (Membrane Filter Procedure) were added. The single agar layer procedure (9224 E) and the two-step enrichment procedure (9224 F) were significantly revised to clarify sampling, procedures, quality control, and reagents and to update the references.



- Fecal Enterococci (9230, formerly Fecal Streptococci and Enterococci Groups) was revised to update sampling information, quality control processes, clarify all procedures, and update the references. Further, it includes a new method (9230 E) Quantitative PCR for Enterococci.
- Legionella (9268) and Leptospira (9270) were reorganized as stand-alone methods and their contents updated to reflect updated information on isolation and detection.
- Detection of Naegleria fowleri (9750) is a new method that provides information on the detection of N. fowleri in waters using culture, PCR, and molecular methods.
- Pathogenic Bacteria (9260) section was split into its component parts and now comprises separate methods, 9260 through 9280.
- All sections were revised to clarify language and update nomenclature, where needed.

Part 10000 – Aquatic Biology

- New section on algal toxins. 10110 Algal Toxin Analysis— Microcystins and Nodularins with ELISA method and LC-MS/MS analysis for total microcystins and nodularins.
- Section for special considerations for sampling cyanobacteria blooms for taxonomy and toxins was added to both Phytoplankton (10200) and Periphyton (10300).
- Chlorophyll a (10150) was restructured to remove the section from 10200 to its own section. Calculation errors in the chlorophyll section were also corrected (previously 10200 H.3).
- Taxonomy was updated in Identification of Aquatic Organisms (10900) for both the dichotomous keys and color algal plates using several reference online taxonomic databases.
- Part 10000 was revised to update references and bibliographies and to clarify specific procedural steps.

For questions regarding Standard Methods, please do not hesitate to contact me at wclipps@shimadzu.com.

Having a Strong Quality Management System Prevents Faulty Results

By Jerry Parr, TNI and Steve Arms (retired)

In 2019, as part of a strategic planning effort, the TNI Board of Directors charged the TNI advocacy committee to “Develop a long-range plan for promoting the use of the TNI accreditation program to data users to show the value/benefits and demonstrate the improvement in performance and data quality.” Phase 1 of this effort shows how the TNI standard improved both laboratory data quality and performance. Results of that were presented in a series of presentations and is summarized in the Ensuring Data Reliability article in this issue of The Institute Review. This effort, initiated in late 2022, was done to show “real-life” examples of data quality problems and why they occurred.

TNI’s focus on ensuring reliable data (i.e., data of known and documented quality generated according to accepted professional practices of the industry) forms the basis for a variety of decisions, such as:

- compliance to a regulated limit of contaminants in air, water, and soil,
- remediation to pre-determined contamination levels for site remediation,
- assessing risk to human health or environment,
- exposure levels used in health surveillance, and
- water and wastewater engineering and technology implementation.

What is “reliable” data? In any analysis, the result is only an estimate of the true concentration, and quality control (QC) results (e.g., reagent blanks, matrix spikes) can be misleading for a variety of factors. Quality assurance (QA) goes beyond method and batch QC and a quality management system (QMS), such as required by TNI’s accreditation program, goes still further to ensure data reliability. This is because a QMS incorporates documentation, training of analysts, frequency of QC and QA checks of equipment and reagents, plus oversight of all procedures performed and review of the results.

“We know we generate good data! We follow the method and do the QC. Why must we do all this ‘management’ stuff that does not relate to quality?” This is a type of a question that often arises. And some of the requirements in the TNI standard may or may not have a direct impact on data quality but do indicate system vulnerabilities that could lead to data quality problems.

For example, during assessments, laboratories frequently receive findings on expired standards, improper sample temperature, equipment not matched to sample, internal audits that did not cover all aspects of testing, SOPs that do not reflect actual practice, deionized water bottle not labeled, and corrections that were not dated or initialed in the laboratory notebook. While these vulnerabilities indicate a problem with the quality management system, the data may or may not have been accurate; however, it is certainly less reliable.



This current effort goes beyond these vulnerabilities and defines faulty data as

- inaccurate or incorrect results,
- insufficient documentation,
- non-conformance to mandated method, and
- failure to meet customer requirements.

The results of this effort have been published in a White Paper, Having a Strong Quality Management System Prevents Faulty Results, available at: <https://nelac-institute.org/docs/comm/advocacy/White%20Papers/WP-Reliable.pdf>. The Appendix to this White Paper provides over 35 “real life” incidents that could have been avoided if a QMS had been in place and followed. While many of these failures relate to sampling or analysis for environmental contaminants these types of failures are widespread affecting many kinds of laboratory testing, including clinical, food, forensics, and geochemical. They affect not just commercial laboratories but also those that work in state and federal agencies, including state criminal and public health laboratories, the US Geological Survey, the US EPA, and the Federal Bureau of Investigation.

This White Paper does not address improper or questionable practices such as:

- Inappropriate manual integrations,
- Selective removal of calibration points,
- Spiking LCS/Surrogates into extract, not sample, or
- Adjusting time clocks.

These improper or questionable practices are usually performed to meet QC criteria and thus may or may not have affected the reported sample result. However, these issues all indicate the lack of a robust data integrity system, and as discussed above, decrease the reliability of the reported results.

The reasons for data quality problems are endless, but there are some areas readily identifiable and easy to remedy. The biggest causes of data quality problems are inadequate training, inadequate management, and insufficient resources, but they all result from a single root cause, the lack of a strong QMS.

The QMS requirements in the TNI standard have a direct impact on both data quality and laboratory performance. Following those requirements will consistently avoid major failures that would result in unsafe drinking water, unnecessary remediation, illegal waste disposal, or other bad decisions based on faulty data. From the laboratory’s perspective following and correctly implementing a robust QMS can avoid loss of accreditation, decreased revenue, reanalysis, or data rejection.

As shown in the case studies in the White Paper, the lack of a strong QMS can affect “complex” and “simple” tests alike and can drastically affect sampling.

TNI believes ALL environmental laboratories and field sampling and measurement organizations in the US should implement a strong quality management system such as the QMS in the TNI standard.

Note: These case studies were also presented at the 2023 Environmental Measurement Symposium and a copy of that presentation is available upon request.

Ensuring Reliable Data

By Jerry Parr, TNI and Michelle Wade, Pace Analytical Services

On August 1, 2023, at the Environmental Measurement Symposium, TNI staff and individuals from the Board of Directors gave a series of presentations on Ensuring Reliable Data. Reliable data is much more than the analytical result. This session showed how implementing a Quality Management System improves data reliability by activities such as measurement traceability, records management, corrective action, purchasing, method validation, and sample handling to demonstrate these activities are equally important in ensuring data quality.

Note: This session expanded on a White Paper published by TNI in 2020, Laboratory Accreditation Makes a Difference: Data You Can Rely On, available at: https://nelac-institute.org/docs/comm/advocacy/White%20Papers/WP-Value_101420.pdf

Patsy Root, IDEXX Laboratories, provided an overview of the session. Since its inception, individuals active in the US National Environmental Laboratory Accreditation Program (NELAP) have struggled to try and find information to convince others that implementing a Quality Management System (QMS) according to the requirements in the TNI Standard Management and Technical Requirements for Laboratories Performing Environmental Measurements improves data quality. Over the years, various surveys and studies have been conducted to try and prove this assertion. However, the problem has been, and always will be, we never know the true concentration of a contaminant in a sample. All measurements are only estimates of the true concentration, and quality control data does not always directly correlate with the measurement of the actual contaminant. In 2019, TNI's Advocacy Committee initiated a new effort to document improved laboratory performance and trust in the data provided by accredited laboratories. Patsy's presentation summarized the outcomes from the Committee's efforts that demonstrates why implementing a QMS based the TNI standard makes a real difference in both data quality and laboratory performance.

Robert Wyeth, TNI, showed why documentation is such a strong component of a QMS for ensuring reliable data. Laboratory data is frequently used in the courts to prove or disprove an environmental concern, such as a wastewater discharge about regulated limits, contamination of groundwater from a hazardous waste facility, or an air emission from an industrial facility. Federal Rule 901, relating to evidence indicates the evidence must be sufficient to support a finding that the "item is what the proponent claims it is." This rule has led to laboratories having to maintain documentation sufficient to reconstruct the result by another expert. While this documentation obviously includes all the raw data such as instrument outputs, calculations, chain-of-custody records, date of analysis, analyst, etc., it must also include meta data associated with the results such as the procedure used at the time of the analysis. This presentation described all of the documentation required to ensure the results can be accepted by the courts.

Maria Friedman, California ELAP, presented on why correctly reporting data is such a strong component on a QMS. The TNI standard require results to be reported "clearly, unambiguously and objectively and include all the information requested by the customer and necessary for the interpretation of the results." Many laboratories lack an understanding of key issues relating to reports such as the use of data qualifiers, understanding detection and quantitation limits, and reissuance of reports. This presentation covered everything needed in a test report to ensure the end user believes it is credible.



Michelle Wade, Pace Analytical Services, discussed the importance of traceability for ensuring reliable data. Laboratories are required to have procedures for achieving traceability of measurements. The chain of traceability can be weak, and thus the data may be characterized as unreliable, when pieces of meta data are missing; worse yet the chain can be broken when links are missing all together. This presentation identified the components (i.e., Certificate of Analysis, Receipt, Usage, Prep and Disposal records, etc.) that have the potential to comprise the chain of traceability for testing laboratories as discussed in Section 5.6 (Measurement Traceability) of EL-V1M2-2016-Rev2.1: Quality Systems General Requirements.

Jessica Jensen, KC Water, discussed the importance of competent analysts in ensuring reliable data. The competency of individuals directly involved in analyses can be a significant factor in whether or not the end user of the data has confidence in the reported results. While the Demonstration of Capability required by the TNI standard provides some documented evidence of competency, it is not sufficient. The end user of the data must have evidence that the analyst possesses basic laboratory skills, such as the correct use of an analytical balance, knows the quality control activities required for each method and how to assess the QC results, knows how to correctly integrate chromatographic peaks, and knows how to operate the instrument correctly. This presentation reviewed how laboratory management and laboratory assessors can objectively evaluate the competency of an analyst.

Jerry Parr, TNI, discussed the judicial system for admitting analytical data with an emphasis on the “Daubert” standards. In 1993, in *Daubert vs Merrell Dow Pharmaceuticals*, the US Supreme Court established foundational principles that relate to the admissibility of scientific evidence:

- Whether a theory or technique can be (and has been) tested,
- Whether it has been subjected to peer review and publication,
- Whether there is a high known or potential rate of error,
- Whether there are professional standards controlling the technique’s operation, and
- Whether the technique has been accepted within the scientific community.

These principles have been upheld in two other Supreme Court decisions. This presentation reviewed the Daubert principles and how they relate to ensuring reliable data.

All of the presentations from this session are available on the [Symposium website](#), and TNI plans to turn the presentations in to a report.

PFAS Drinking Water Fields of Proficiency Testing Coming Soon

By Stacie Crandall, Hampton Roads Sanitation District

Per- and Polyfluoroalkyl Substances (PFAS) have recently come to the forefront as chemicals of concern in the environmental community, including laboratories. In 2020, the Proficiency Testing Program Executive Committee (PTPEC) received an analyte request form for 29 PFAS compounds to be added to The TNI PT Program as Drinking Water Fields of Proficiency Testing (FoPT). These compounds were identified by EPA to be included in UCMR 5, and six now fall under a newly proposed National Drinking Water Standard.

With Proficiency Testing being an important component of laboratory accreditation, development of FoPTs for PFAS has become a high priority for the PTPEC Chemistry Subcommittee. The Subcommittee, chaired by Amy DeMarco (New York State Department of Health), is currently developing all criteria, including determining concentration ranges and acceptance limit assignment criteria for these compounds following procedures outlined in TNI SOP 4-101, "Calculation of Acceptance Limits for Chemical, Radiochemical, and Microbiological Components of Proficiency Tests."

Once all approvals are completed and PT providers are notified of this change, the table will be posted on the TNI website with an implementation date included to give PT Providers time to incorporate these new FoPTs into their product list.

Member Spotlight: Dorothy Love

By Zonetta English, Louisville Jefferson Co., MSD

Dorothy's path to a career in Environmental Science probably began in 5th grade when her class read "Silent Spring" by Rachel Carson. Combined with an aunt who was a Biology teacher who took her to various streams to help collect samples for her classroom lab, her interest was piqued. Dorothy graduated from Indiana University of Pennsylvania with a B.S. in Environmental Health in 1981. At that time, the job market in her home state of Pennsylvania was not ideal, so she took off for Texas where she started work with an environmental research group at Texas A&M University. After a couple of years there, she moved to Houston and worked in the State Lab under the (then) Texas Department of Water Resources. In 1989, Dorothy decided it was time to come back to Pennsylvania and heard about an environmental lab called Lancaster Laboratories. Dorothy states, "They had an opening in their pesticides department where I worked for 9 years in data reviews, SOP writing, investigations, etc. When an opening came up in QA, it was a perfect fit. With the growth of Lancaster Laboratories and the transition to Eurofins during the subsequent 25 years, I am where I am today, a QA Director at our national level for Eurofins Environment Testing."



From the time Dorothy started in QA with Lancaster Labs, she began attending conferences, including EPA's Waste Testing and Quality Assurance (WTQA) which later morphed into TNI and NEMC. Her initial involvement in TNI was six (6) years on the Quality Systems Expert Committee, followed by six (6) years on Laboratory Accreditation Systems Expert Committee. Along the way, she picked up chairing the TNI Mentor Session.

Dorothy credits this experience as being instrumental in her meeting many individuals within the accreditation community. She says, "It has been rewarding to see the advances in TNI and that we can effect change. I am somewhat disappointed that after all these years, it has not become a true National program. It would be great to have everyone agree on how to manage accreditation and our laboratory requirements as we really all do have the same goals for the environment. There are just still many routes to take to accomplish those goals."

Outside of work life, Dorothy has two sons (Kevin and Andrew), and three grandchildren (Teagan, Kieran, Rylan). A major life change happened when she met her husband, Jeff Graby, about 7 years ago and he introduced her to tennis. Dorothy says she doesn't claim to be a skilled tennis player; however, it is a very fun activity. Her other leisure time activities include cheering for the Philadelphia Eagles and Cincinnati Reds, reading, and she recently added bike riding (on easy flat trails).

Dorothy volunteers in her community on the Youth Aid Panel. This is a program under the district attorney's office where first-time offenders under the age of 18 are referred to the panel by the police or district justice. The panel meets with the youth and their parents to discuss their case and comes up with a contract (community service, etc.) that the youth must complete. If they successfully complete the contract, then the charges are never filed, and their record is clear. Dorothy states "We all know kids will make mistakes and this gives them a great opportunity to redirect their lives."

ChairSpeaks

“Musings from the TNI Chair”

Driving on the Left

I just got back from a trip to Scotland, my first venture overseas in decades. Scotland is a beautiful country that has retained its own culture and style without forsaking an English connection. In spite of past attempts at subjugation, Scotland remains bravely distinct, but still an integral part of the United Kingdom, where roundabouts outnumber traffic lights, many prefer tea, and all drive on the left.

This was not my first time driving on the other side of the road, but on this trip, I treated myself to an automatic car and was able to improve my driving skills without worrying about gears and a clutch. I had more time to think of habits and perspective.

By nature, I am not too afraid to put myself in situations that get me out of my comfort zone, so I was not overly daunted by the prospect of driving in Scotland, but it had been a long time. It is quite telling how much of driving consists of automatic, almost autonomic responses.

My mantra was: go “left, left, left”; look “right, right, right”; when in doubt do another round at the roundabout, bout, bout; and when backing up look left, left, left.” Repeat, repeat, repeat.

After the first day I had to invoke my riding chant less, and after the second day, and getting a booster cushion to improve my sight lines in my impossibly low car seat, I had developed “the habit”, disturbed just on a few occasions by the inevitable close encounter or distraction. I thought about chiral compounds and stereochemistry. It did not take that long to convert from L-Alfredo to D-Alfredo, or was it vice-versa? I am a lefty, so sometimes I am not sure, but there was a change.

Changing Views

When we seek other perspectives and mindfully make ourselves see differently, we gain insight about us and the world. If we are always looking at only one side, we most definitely are only getting a partial view. I am reminded that public speakers are admonished to strategically look to the left side of the audience because most presenters favor the right; the shift can also be used for stress, as in visual punctuation, and to break monotonic focus.

Getting from A to B does not always have to follow a linear trajectory; entering the circle can get you across as well or give you time to contemplate alternatives before exiting. You may or may not end up at the same destination, but in the process, what panoramas you could witness! The best type of travel can not only delight us with our destination sites, but can also transform us if we are open and pay attention.



Being the Other

A colleague who had been a regulator was telling me how in the past she tended to dismiss comments about approachability, but now working as a consultant, she understood why laboratories tended to be less than candid about providing feedback on assessors. After I transitioned from government assessor and regulator to laboratory manager, I was able to validate some of what I had done right and reflect on what I could have done differently when my laboratory was assessed. Being on the laboratory side for an on-site assessment was a bit like driving on the left on a well traversed road. Being on the other side enriched my perspective.

Mirror, Mirror

The Institute’s standard development process is predicated on the consensus of stakeholder groups representing the diverse interests of our environmental laboratory and field measurement organizations community. The TNI Standard considers the perspectives of these diverse groups and forges them into a product of utility for all.

But even within the halls of consensus, individuals can become entrenched in their singular perspective. In fact, on the notion that no one group can be presumed to harbor anything but its own perspective, other groups need to join the dance. But wouldn’t it be different and refreshing if we tried to cultivate the other side’s view and, if for just a brief excursion, learned and understood how the other side sees or does it? What if we were to become less of a number one (1) and more of a three thirds (3/3)? We would still have the same numerical value, but oh, so differently expressed and perceived!

I challenge myself to think “the other way” because it enriches my life and makes me a better leader and manager. When I attentively consider the perspectives of my accreditation bodies and all the “others” I interact with in and outside TNI, I feel more connected, and a bit wiser.

I invite you to drive on the other side, switch your view from right to left (or left to right if you are turning) and go around the discovery circle to reach a beautiful destination. If you do it often, it may just become a habit.

Only connect.

Alfredo

Alfredo Sotomayor
TNI Chair

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