Whole Effluent Toxicity Testing Expert Committee Meeting Summary

May 17, 2017 1:00 pm Eastern

1. Welcome and Announcements

Rami welcomed everyone to the meeting. Minutes of the April 19, 2017, meeting were approved. Attendance is recorded in Attachment 1, below.

2. The Webinar from Assessment Forum Presentation

This webinar is scheduled for noon to 4 pm Eastern on Wednesday, May 24, 2017, and Elizabeth graciously offered for Ginger to use her office for the event, since that is nearby and has a more reliable internet connection. The presenters planned a practice run on May 22. The training announcement went to all TNI members, not just the NELAP assessors, as planned. Rami thanked Ginger, Katie, Beth, Elizabeth and Teresa for their efforts on this activity.

3. Follow-Up to SETAC Meeting

No one who'd attended SETAC was present to discuss the meeting, but Rami noted that a WET session is being planned for the next conference, that will be in Minneapolis in November 2017.

4. Agenda for Conference Session

Pete will attend conference in Washington, DC, and lead the WET session. **NOTE: The WET session will be on Wednesday afternoon from 1 – 5 pm.** The time printed in the Preliminary Program is wrong; there were scheduling difficulties that made a move to the Wednesday afternoon time block necessary.

The agenda will be as follows:

- Welcome and Introductions
- Brief Presentation about Committee Activities and WET Testing
- WET Request to PTPEC (at whatever stage of development that is, for discussion)
- Revision of the WET Module of TNI Standard
    - Demonstration of Competency concepts
    - Reasonable QC for Necessary Chemistry Tests Applicable to WET Methods

5. Second Set of Questions

The previously supplied draft requires incorporation of additional comments from several committee members. Rami will revise the draft and circulate it for final approval at the June meeting.

Rami proposed dividing the remaining time between V1M7 and the PTPEC request, so that review of both could get underway.

6. Revising the WET Module (V1M7)

Steve provided a redline mark-up of the 2009 version of V1M7 for committee discussion. He thanked committee members who had shared their lab procedures with him as he drafted the changes. Participants began working through the module, section by section, after a preliminary discussion about whether sediments and soils are even appropriate matrices for WET testing. Discussion points are noted below.

> §1.1 – the list of possible matrices in the 2009 module is appropriate, since at least one AB (LDEQ) accredits for sediments and soils. Another idea was to provide a more

generic description that would include commercial products and other materials (such as solids to be ground up for testing.) Tentative agreement was to use wording similar to "test materials for aquatic environmental samples" rather than trying to list all possible specific materials.

§1.4 – it might be preferable to refer to language in the Quality Systems module (V1M2) rather than use the language in the 2009 text. Lynn is checking to see that the standards development process procedures are, for making such reference, whether specific (since V1M2 will surely change with the ISO 17025 revision that's underway) or generic reference is preferable here, or if specific language is needed.

§1.5 – the third paragraph of this section should qualify the PT requirement by indicating "when available" or some similar wording.

Review of the draft revision will continue at the June meeting at section 1.5 and continuing from there as time permits.

7. Improving Utility of PT Results

After the April meeting, Mark contacted Rami, offering to draft an initial document for the recommendation from the WET committee to PTPEC, seeking to modify WET PTs so that the results are more meaningful and reliable. Mark worked with Rami to craft some introduction and background language for PTPEC as well as the specifics of the committee's request. The initial draft is included below as Attachment 3.

Initial discussion focused on clarifying the purpose of this document – asking for a particular solution that will likely require cooperation among PT Providers (PTPs) – that would allow comparing all PT data (same toxicant, same method parameters) to reduce variability. Additional points brought up were the possible inclusion of historical data to increase the statistical power of the data set as well as having the specifics of the method be mandated by the PTPs (# replicates, etc.).

At that point, the meeting time was over. Rami asked that committee members please contemplate the draft again, consider what to keep, what to add and what to delete, and send comments to Mark prior to the next meeting.

8. Next Meetings

The next teleconference of the WET Expert Committee will be on **Wednesday, June 21, 2017**, at 1 pm Eastern. Teleconference information and an agenda will be circulated in advance. Agenda items will include the webinar,

The following meeting will be on July 19. At present, the only meeting planned for August will be the session at conference on August 9, but teleconference capability will not be available there.

Attachment 1

Committee Membership

Member	Affiliation	Email	Category	Term Expiration	Present
Rami Naddy (Chair)	TRE Env. Strat. LLC	naddyrb.tre@gmail.com	Lab	Feb. 2018	Yes
Ginger Briggs	Bio-Analytical Laboratories	bioanalytical@wildblue.net	Lab	Feb. 2018	Yes
Pete De Lisle (Vice Chair)	Coastal Bioanalysts Inc.	pfd@coastalbio.com	Lab	Feb. 2018	Yes
Steven Rewa	Environmental Resources Management	steven.rewa@erm.com	Lab	Feb. 2018	Yes
Chris Burbage	Hampton Roads Sanitation District	cburbage@hrsd.com	Lab	Feb. 2018	No
Chris Pasch	Alan Plummer Associates, Inc.	cpasch@apaienv.com	Other	Feb. 2018	No
Teresa Norberg-King	USEPA	norberg-king.teresa@epa.gov	Other	Feb. 2018	No
Elizabeth West	LA DEQ LELAP	elizabeth.west@la.gov	AB	Feb. 2018	Yes
Amy Hackman	Penn. Dept. Environ. Protection	ahackman@pa.gov	AB	Feb. 2018	No
Michele Potter	New Jersey Dept of Environ Protect.	Michele.Potter@dep.nj.gov	AB	Feb. 2018	No
Michael Pfeil	Texas Comm. Environ. Quality	Michael.pfeil@tceq.texas.gov	AB	Feb. 2018	Yes
Kari Fleming	WI DNR	kari.fleming@wisconsin.gov	AB	Dec. 2017	Yes
Associate Members					
Grant Aucoin	LDEQ	grant.aucoin@la.gov	AB	--	No
Michael Chanov	EA Eng,, Sci. &Tech.	mchanov@eaest.com	Lab (Assoc.)	--	Yes
Kevin Dischler	Element Materials	Kevin.dischler@element.com	Lab (Assoc.)	---	Yes

	Technology				
Monica Eues	CK Associates	Monica.eues@c-ka.com	Lab (Assoc.)		No
Joseph Faircloth	FL DEP	joseph.faircloth@dep.state.fl.us	Lab (Assoc.)		Yes
Vel Rey Lozano	USEPA Region 8	Lozano.VelRey@epa.gov	Other (EPA)	--	No
Linda Nemeth	Northwestern Aquatic Sciences	lnemeth@tds.net	Lab (Assoc.)		No
Mark O'Neil	Environmental Enterprises USA, Inc.	moneil@eeusa.com	Lab (Assoc.)	---	Yes
John Overbey	American Interplex Corp.	joverbey@americaninterplex.com	Lab (Assoc.)		No
Joe Pardue	Pro2Serve	Parduegjjr@oro.doe.gov	Other	---	No
Katie Payne	Nautilus Environmental	katie@ nautilusenvironmental.com	Lab (Assoc.)		Yes
Shain Schmitt	ESC Lab Sciences	sschmitt@esclabsciences.com	Lab (Assoc.)		No
Thekkekalathil "Chandra" Chandrasekhar	FL DEP	Thekkekalathil.Chandrasekhar@ dep.state.fl.us	Other (Assoc.)		No
Beth Thompson	Shealy Consulting	bthompson@ shealyconsulting.net	Lab (Assoc.)		Yes
Karla Thurman	Los Angeles County Sanitation Districts	kthurman@lacsd.org	Lab (Assoc.)		Yes
Tom Widera	ERA	twidera@eraqc.com	Other		No
Lynn Bradley	TNI	Lynn.Bradley@nelac-institute.org			Yes

Attachment 2

Action Items

	Action/Activity	**Responsible Person(s)**	**Anticipated Completion**	**Comments**
10	Review 2009 and 2012 versions of V1M7	All members	Summer 2018	Be prepared to discuss DOC revisions
11	~~Pick a target timeframe for presenting the Webinar from the August 2016 Assessment Forum~~	~~Rami, Ginger, Beth and Katie, and other members~~	~~Will be presented May 24, noon-4 pm Eastern~~	~~Planning calls underway with Rami, Ginger, Beth, Katie, Elizabeth, Teresa and Lynn~~
12	Finalize responses to second set of questions	Rami	June meeting	Revised draft for approval at June meeting
14	Consider ways to improve usefulness of PT testing for WET	All members send comments to Mark	July meeting?	Review of draft began in May
15	Draft language about DOC requirements	Steve with selected reviewers	??	May meeting begins the review

Attachment 3 – DRAFT Recommendation to PTPEC

Background of the Issue

A concern recently brought up the Whole Effluent Toxicity (WET) Expert Committee is how Proficiency Testing Providers (PTPs) are analyzing WET Discharge Monitoring Report Quality Assurance (DMRQA) / Proficiency Testing (PT) data given the limited number of WET labs that participate, that those labs that participate can use one of three different PTPs (further reducing the number of WET labs using any given PTP), and there are a few WET tests that are specialty tests so there are even fewer WET labs that perform those studies. The concern is that with limited datasets (e.g., three to five labs participating) how acceptability and out of range values are determined and could there be improvements to this process.

Primary Purpose of PT Testing with WET Test Methods

The TNI WET Expert Committee believes that the primary purpose of EPA's DMR-QA testing program (and potentially other PT testing programs) is to compare the WET toxicity testing results among laboratories. Using this approach the results from one laboratory are assessed in comparison to the results of all the other participating laboratories. Therefore, given that all the data from participating laboratories will be combined and compared to each other, it is imperative that the WET test methods (and endpoints) are standardized among those laboratories to have the best and most useful data possible. There are some specific test method requirements associated with DMR-QA testing and there should be additional detail added to the methods (see attached table for a set of conditions associated with each test method). If the laboratories obtain acceptable results participating in the DMR-QA tests under strictly controlled conditions, the Committee is confident that the laboratory can also produce reliable data in whatever conditions their clients' permits require.

WET Expert Committee Charter Objectives

1. Standardize Proficiency Testing conditions and endpoints
   - **Success Measure:**
     - Standardize test conditions required for PT / DMRQA WET studies, rather than the current practice of conducting multiple tests using different NPDES permit test conditions, so that a statistically significant number of comparable sample results are available.
     - Improve the statistical power and evaluation of WET data sets and results in PT / DMRQA studies by selecting one statistical method to calculate the test endpoint and eliminating the use of hypothesis test endpoints.

2. Offer expert assistance to TNI on WET testing methods, quality control and data interpretation.
   - **Success Measure:**
     - Educate assessors on IC25 vs. NOEC for PT / DMRQA endpoints.
     - Work with PT providers (PTPs) and assessors to consolidate, clarify, and improve the guidance on acceptable and unacceptable corrective actions for laboratories when a PT / DMRQA study result is outside of the acceptance limits.

Assumption & Limitations of PT / DMRQA with WET Test Methods

Statistical Limitations:

- Accuracy does not apply to WET testing as it would apply to a solution of metals or pesticides for analytical testing. A unit of toxicity cannot be gravimetrically delivered to PT / DMRQA sample vials. Study "true" or assigned values and acceptance limits are derived from participating laboratory data. Since accuracy does not apply to WET testing the identification of systematic error among participating laboratories is questionable.

- There is a small statistical data set for PT / DMRQA studies for some WET test methods due to a few number of participating laboratories and there is a potential for small statistical data sets to be divided into smaller data sets among multiple PT Providers. Small data sets cause the statistical evaluation of a "true" or assigned value and acceptance limits to be less powerful and questionable.
- (A WET Expert Committee Objective) Toxicity endpoints (LC50, IC25, NOEC) can be greatly affected by variables such as temperature, water hardness, test duration, dilution series, etc. These test conditions are not adequately standardized among WET test methods used in PT studies.
- The experimental test design among participating laboratories in PT / DMRQA studies is not reported to PT Providers so deviations from a standardized test design cannot be assessed as a potential factor affecting statistical test results. Unaccounted for interlaboratory variability will impair the statistical assessment of test results and any resultant corrective actions.
- Toxicity endpoints ((LC50, IC25, NOEC) can be greatly affected by the health of the test organisms during testing. Minimum test acceptability criteria establish minimum health limits for valid toxicity tests. PT / DMRQA studies do not take into account the health of the test organisms that may be greater than the minimum test acceptability criteria. Factors affecting the robustness of the test organisms may include test organism age, initial mass of test organisms, molting of carapace, etc.
- The various sources of test organisms used in PT studies is an unaccounted source of statistical variability. Laboratories that do not culture their own test organisms may purchase test organisms from one or more vendors. Other laboratories may routinely culture and use their own test organisms, but may occasionally supplement their test organisms from vendors. The robustness of test organisms cannot be controlled by laboratories or PT providers (PTPs).
- U.S. EPA WET test manuals assess WET laboratory statistical performance using SRT testing control charts using a minimum of 5 data points averaged together with a maximum of 20 data points per laboratory, and takes into account intralaboratory variability having established upper warning and control limits while PT studies do not. Evaluating for and reducing intralaboratory variability decreases the probability of random errors occurring within laboratories participating in PT / DMRQA WET studies but does not address the probability of systematic errors occurring among participating laboratories.

Standard Reference Toxicants:

- Standard Reference Toxicants (SRTs) used in PT samples are not identical to all the various kinds of toxicants encountered in WET samples, nor are the SRTs used in PT studies always identical to the routine SRTs used for control charts by laboratories. Ideally, representative toxicants of concern frequently encountered in WET samples would be routinely tested as a SRT in a standardized test in both PT studies and in WET laboratories.

Test Organisms:

- Laboratory test organisms are a taxonomic surrogate / representative of various species in the wild. The response of test organisms to various kinds of toxicants is dependent upon the initial genetic characteristics of the initial population of the test species obtained from the wild and natural selection pressures upon the genetic characteristics of subsequent generations of test organisms cultured within the laboratory.

Potential Solutions for Consideration

- Seek to have PT providers (PTPs) agree to use the same toxicant for each study, in order to increase the statistical power of calculations that determine pass/fail for the study round.
    - Voluntary cooperation among PTPs is highly unlikely unless TNI mandates it, and even then, the mandate alone might not be sufficient to induce all PTPs to join in a cooperative effort.

- Seek to have PTPs combine data across years for tests with the same toxicant to increase the sample size.