Radiochemistry Expert Committee (REC)
Meeting Summary

May 26, 2021

1. Roll Call and Minutes:

Terry Romanko, Chair, called the meeting to order at 1pm Eastern on May 26, 2021 by teleconference. Attendance is recorded in Attachment A – there were 8 members present. Associate members in attendance: Mark McNeal, Carl Kircher, Bob Shannon, Richard Denton, and Patrick Garrity. Guest: Keith McCroan.

The February meeting minutes were sent by email and reviewed on Webex by the Committee. A motion was made by Sherry to approve the February 24, 2021 minutes as written. The motion was seconded by Stan and there was no further discussion. The motion was unanimously approved.

The April minutes were sent by email and reviewed on Webex. A motion was made by Jim to approve the April 28, 2021 minutes as written. Robert seconded the motion and there was no further discussion. The motion was unanimously approved.

2. Radiochemistry Charter

The Committee finished up the Charter at the last meeting, but there was a question about whether there needed to be a success measure to ensure the committee followed standard development documentation requirements. The CSDEC decided it was not necessary. The addition will not be made.

A motion was made by Jim to approve the Charter as sent with the agenda. The motion was seconded by Robert and unanimously approved.

Terry will change the date on the first page and send a final copy to Paul Junio and Ilona.

3. SIR 403

An issue was raised regarding the Committees response to SIR 403. Terry and Carl Kircher corresponded by email and the information is a good summary of the concerns discussed in today's meeting. The first message is from Terry and the second is from Carl and Terry's responses are in blue.

From Terry:
I understand you have a concern about the TNI Radiochemistry Expert Committee's (REC) response to SIR 403 in regards to counting of radiation measurement batches (RMB). As far as I can discern, it appears you are under the conviction that a RMB must

be counted on a single detector. I get this from your proposed wording to replace the language provided by the REC which includes "the Radiation Measurements Batch (RMB) is defined by detector, by sample geometry, by time duration (14 days or less), and by analyte(s)" (underline emphasis mine). Note that the V1M6 Standard does not use the word "detector" in defining the RMB. The definition from section 1.3 that you reference states:

> ***Batch, Radiation Measurements (RMB):*** *A Radiation Measurements Batch is composed of one (1) to twenty (20) environmental samples that are counted directly without preliminary physical or chemical processing that affects the outcome of the test (e.g., non-destructive gamma spectrometry, alpha/beta counting of air filters, or swipes on gas proportional detectors). The samples in an RMB share similar physical and chemical parameters, and analytical configurations (e.g., analytes, geometry, calibration, and background corrections). The maximum time between the start of processing of the first and last sample in an RMB is fourteen (14) calendar days.*

Note that the adjective "similar" (which I underlined for emphasis) applies to "analytical configurations" just as it does to "physical and chemical parameters". When adding the concept of the RMB to the 2016 Standard, the REC utilized the word "similar" purposely, not "the same" (or other prescriptive modifier), specifically to allow for the employment of multiple instruments/detectors.

Further, the application of the RMB needs to be taken in context with the whole of V1M6, where RMB is discussed in several sections. Most of these other sections, while not specifically stating multiple detectors may be used, do not preclude the use of multiple detectors in one RMB. Notice that I used the word "most" in the prior sentence. Rather than clutter this email with excessive evidence of the intent of the RMB (much exists in the Standard), I direct you simply to Section 1.7.2.4.b.iii:

> *At a minimum, the laboratory shall analyze one (1) MD per Preparation Batch or RMB. For RMBs, the MD shall consist of a second measurement of one sample. If the batch is counted on more than one (1) detector, the MD shall be performed on a second detector.*

The underline again is mine for emphasis – this statement clearly allows for multiple detectors to be used for a RMB, and specifically requires that if multiple detectors are used, the matrix duplicate shall be counted on a second detector . Thus, I believe your interpretation to limit a RMB to a single detector is unfounded, especially taken in context of the whole of Module 6 of the Standard.

In summary, I believe the REC response to SIR 403 is accurate and not in conflict with the Standard.

From Carl: *Now, since I am being asked about my SIR vote on the NELAP AC (currently "Needs Discussion"), I guess I have to revisit this again. Therefore, in the interest of how this NELAP AB is reading TNI V1M6 and applying it to the accreditation of radiochemistry testing laboratories, this is how we are enforcing it (after reading the*

EPA Method(s), SM, dissecting TNI V1M6, and reviewing the SDWA on-line Radiochemistry Certification Officers refresher training (that EPA Region 4 recommended that I do and in fact did in 2019)).

Section 1.3: FL-DOH ELCP has had no requests for laboratory certifications for air filters or swipe samples. Therefore, the only tests where a RMB could be applied is Photon Emitters by EPA 901.1, SM7120B, or its equivalent solid-phase-sample test method. All the other tests have physical (e.g., evaporation) or chemical (e.g., precipitation) processing, so the quality control for these methods would be exclusively defined by Preparation Batch. As to the Photon Emitters, the Gamma Spectrometers that I know of each have just one detector. So, Yes, for this SIR 403, I believe that I am correct in defining the RMB by detector, along with the other example attributes (where geometry is specifically listed). All the QC requirements for Method Blank, LCS, and Duplicate in Sections 1.7.2-1.7.3 apply by geometry and by instrument / detector.

Regardless of what requests FL-DOH ELCP has had requests for, the TNI Standard applies to all methods under consideration in the standard. So, we should be sure to be consistent in our application of the Standard across all detector/instrument types whether we be considering air filters or swipes, water samples or pre-prepared (in the field by the client) LSC vials. This would include alpha spectrometry (AS), gamma spectrometry (GS), gas-flow proportional counting (GFPC), liquid scintillation counting (LSC), and scintillation (e.g. Lucas Cell) counting, although generally a RMB would typically be associated with GS, GFPC, or LSC. Each of these instrument types may have multiple detectors which can operate "independently", but are typically controlled through a common interface.

Section 1.7.1.2: Initial Calibration: (a)(i) subjects radiation measurement systems to calibration following replacement of a key detector element. Therefore, counting on a different detector (which I think is a key detector element) requires fulfillment of the calibration requirements for each detector used.

Your reasoning appears to be circular here – you are going into this with the assumption that only one detector can be used per RMB, and that because a second detector is not the first detector, this is not acceptable. The REC made it clear in the response to SIR 403 that the intent to TNI Module 6 is not to limit a RMB to a single detector. To make it absolutely clear – it is acceptable to count a RMB on multiple detectors (that meet all requirements under TNI Standards), and as stated in a previous email (highlighted below), there is a specific reference that the matrix duplicate (MD) must be counted on a separate detector if more than one detector is used to count a RMB.

It is probably important to also point out that TNI Module 6 recognizes advancements in empirical and/or computational techniques in section 1.7.1.2.d. This allows for an initial "characterization" (calibration) of a detector, followed by the use of calculational techniques to "project" the detector characteristics to varying geometries, densities, etc to account for the differences in efficiency due to physical or spatial parameters such as self-absorption and angle of incidence of the gamma rays on the detector. In other words, a single "Initial Calibration" may be used for all geometries as long as all the requirements in 1.7.1.2.d are met. For more information, you may want to explore explanations regarding Mirion/Canberra's ISOCS or AMETEK/Ortec Angle software.

Section 1.7.1.4: Instrument Performance Checks: The explanation here states that these checks are to track the stability of key detector response-related parameters over time. I hope I am correctly equating these Performance Checks as the Efficiency Calibrations specified in the test methods. If so, then these Checks are required for each detector at the frequencies stated in (b)(i). As to whether these Checks are required by geometry, the TNI Standard is not crystal-clear. The language in Section 1.7.2.1(c)(ii) implies that the answer is "Yes." However, the knowledge gained from the EPA SDWA Cert. Officer course unequivocally says that the answer is "Yes"; no way that a Gamma Spectrometer Efficiency Calibration for a 4-liter Marinelli polyethylene beaker can serve as the calibration for a 1-pint cylindrical container (tuna can).

You are incorrect to equate the performance checks to the efficiency calibrations. Each detector must have an initial calibration (IC, as required in section 1.7.1.2 Initial Calibration) – this IC is what defines the efficiency equation utilized for the calculation of results, or the "Efficiency Calibrations" you reference above (highlighted sentence). Each individual IC on a detector must be followed by an independent calibration verification (ICV, section 1.7.1.3). Then, Instrument Performance Checks (IPC, section 1.7.1.4) are used "to measure and track the stability" of the detector over time. Again, the IC is not the same as the IPC. Note that for all intents and purposes, an IC continues to be valid as long as the IPC remains in control. This, by the way can be for many years for radiation detection instruments such as gamma spectrometers – I know of at least one laboratory that has IC dating back to 2012. If you are thinking in the "Chemistry" realm and how IC are often performed on a daily basis (or even every 12 hours), you would be mistaken. For further clarification, there is only a single IPC per detector per day (not one per geometry). This is due the fact that if the characteristics of the detector change (demonstrated by the performance check being out of control), all the geometry calculations would be considered suspect.

Section 1.7.1.5: Subtraction Background Measurements: (a) says it's specific to each detector. As to whether these Checks are required by geometry, the TNI Standard is not crystal-clear. The language in Section 1.7.2.1(c)(ii) implies that the answer is "Yes." However, the knowledge gained from the EPA SDWA Cert. Officer course unequivocally says that the answer is "Yes."

You are correct that Subtraction Background Measurements (often called Initial Calibration Background, or ICB) are detector-specific. We will use a gamma spectrometry detector as an example here, as it appears to be your main focus (although the same would apply to all instrument types). According to Section 1.7.1.5.c.ii.a, the ICB for a gamma spectrometry system must be performed a minimum of monthly. This one ICB is counted, a count rate determined for each peak or isotope, and this count-rate is applied (subtracted) from the sample count rate for that peak (or isotope). This is often referred to as peak background correction (Ortec names this generated file by the .pbc extension). In other words, this correction is performed at the counts (or cps) level (in the numerator of all the calculations), and is independent of efficiency (which is in the denominator of the equations), and thus is for all intents and purposes independent of the geometry. After the ICB is subtracted from the individual sample count peak(s), the geometry correction (calculation) is then applied.

Section 1.7.1.6: Short-Term Background Checks: The explanation here states that these checks are to monitor each detector for trends and deviations from Poisson statistics. As to whether these Checks are required by geometry, the TNI Standard is not crystal-clear. The language in Section 1.7.2.1(c)(ii) implies that the answer is "Yes." However, the knowledge gained from the EPA SDWA Cert. Officer course unequivocally says that the answer is "Yes."

Similar to IPC, the short-term background check (STBC) is detector-specific, but not geometry-specific per se. The main purpose of this check is to ensure that the ICB being applied to the result is still "statistically valid". The STBC would call attention to, for example, a contamination event, that could cause results to be biased.

Conclusion: If these questions came to FL-DOH ELCP to determine if a Plan of Correction was acceptable, rather than to a TNI expert committee as a SIR, these would have been our answers to the 2 questions posed:

(1) No

(2) Yes, as long as (on the same detector):

a. There is a Method Blank for RMB #1 and a Method Blank for RMB #2 (note: These might be the same as the short-term background check, unless an empty container is used for the background checks and a DI-water / blank soil filled container is used as the Method Blank).

b. There is a LCS for RMB #1 and a LCS for RMB #2 (note: These may not be the same as the Efficiency Check standard; depends on the "analyte"; might be the same for "Photon Emitters" colligatively if the sample matrices are matched).

c. There is a sample matrix Duplicate for RMB #1 and sample matrix Duplicate for RMB #2.

d. The number of client samples counted each for RMB #1 and RMB #2 is < 20.

e. The total count times for the samples, calibrations, backgrounds, and QC in each RMB do not exceed the 14-day maximum.

f. Short-term Background Checks are run each for the RMB #1 geometry and the RMB #2 geometry at the required frequencies (1.7.1.6(b)(ii) implies beginning, end, and 7 calendar days in between for each RMB).

g. Instrument Performance Checks are run each for the RMB #1 geometry and the RMB #2 geometry at the required frequencies (twice weekly for the semiconductor detectors; or beginning, end, and 7 calendar days in between for each RMB).

h. The previous evaluations of the Subtraction Backgrounds for each geometry are less than 1 month old.

Not addressing possible misconceptions in the individual points under 2) above (a-h). However, what is at issue within the TNI organization and specifically the TNI REC response to SIR 403 – the REC stands by its interpretation of TNI Module 6 that a RMB does not have to be counted on a single detector, but rather can be spread across multiple detectors (just as the counting of a prep batch may be). If the FL-DOH ELCP has issue with TNI Module 6 and any interpretations provided by the REC, the FL-DOH ELCP could submit a SIR accordingly for clarification. However, individuals at FL-DOH ELCP should not try to supplant an interpretation from the REC pertaining to matters associated with the TNI Module 6 Standard.

The Committee does not think the response to SIR 403 needs anything else and it is not in conflict with Module 6. Samples can be counted on multiple detectors on multiple days.

Additional support from Committee members was voiced. Robert mentioned that Kristin Brown (Chair, NELAP AC) supported the response too.

Terry thinks that some of the ABs who reviewed the SIR now have more information and are actually OK with the response. This issue should no longer be an issue.

TNI does not control other states and programs and they may have stricter requirements. TNI does allow samples to be counted on multiple detectors on multiple days.

All the detectors are individual with their own electronics, but are often controlled by one interface computer.

Terry offered to spend time with Carl offline to continue this discussion if that will holp with understanding the response. The important thing to note is that the Committee is in agreement with the original response.

Terry will send an email to Lynn Bradley to let her know the Committee discussed this with Carl and stands behind their original response.

4. New Business

None.

5. Action Items

A summary of action items can be found in Attachment B.

6. Next Meeting and Close

The next meeting will be June 23, 2021 at 1pm Eastern. *(Addition: The June meeting was canceled. The next meeting was July 28, 2021 at 1pm Eastern.)*

A summary of action items and backburner/reminder items can be found in Attachment B and C.

The meeting was adjourned at 2:01pm Eastern. (Motion: Jim Second: Amanda Unanimously approved.)

Attachment A
Participants
Radiochemistry Expert Committee

Members	**Affiliation**		**Contact InAffirmativemation**
Terry Romanko Chair (2024) **Present**	TestAmerica Laboratories, Inc.	Lab	Terry.romanko@testamericainc.com
Sherry Faye (2022*) **Present**	Wadsworth Center, NY State DOH Albany, NY	Lab	sherry.faye@health.ny.gov
Velinda Herbert (2024) **Present**	National Analytical Environmental Laboratory	Lab	Herbert.velinda@epa.gov
Brian Miller (2024) **Present**	ERA	Other	bmiller@eraqc.com
Stan Stevens (2023*) **Absent**	Perma-Fix Environmental Services	Other	stanws@aol.com
Amanda Fehr (2023*) **Absent**	GEL	Lab	amanda.fehr@gel.com
Jim Chambers (2023*) **Present**	Fluor-BWXT Portsmouth LLC	Other	jim.chambers@ports.pppo.gov
Greg Raspanti (2022*) **On Leave**	New Jersey Department of Environmental Protection	AB	Greg.Raspanti@dep.nj.gov
Robert Aullman (2022*) **Present**	Utah Department of Health	AB	aullman77@gmail.com
Chrystal Sheaff (2024*) **Present**	Energy Laboratories, Inc.	Lab	csheaff@energylab.com
Mary Beth Gustafson (2024*) **Present**	Virginia	AB	mary.gustafson@dgs.virginia.gov
Ilona Taunton (Program Administrator) **Present**	The NELAC Institute	n/a	Ilona.taunton@nelac-institute.org

Attachment B

Action Items – REC

	Action Item	Who	Target Completion	Completed
90	Send note about method codes and concerns to the PT Expert Committee. Is there a way to limit the codes a lab can use to report PT data?	Bob	TBD	
105	Review Charter	All	TBD (Feb or Mar)	
106	Prepare 2021 goals.	All	TBD (by mid January)	
107	Send new membership to Chair of CSDP EC Affirmative approval.	Terry Ilona	2/24/21	
108	Review Final Draft of Standard Affirmative any needed changes.	Robert and Chrystal	3/23/21	
109	Complete SIR 399 and 403 by email.	Terry	3/23/21	Complete
110	Review Stakeholder group and confirm it is what it should be.	All	3/23/21	
111	Check with Paul Junio about Charter objective regarding standard development documentation.	Ilona	5/26/21	Complete
112	Confirm with Lynn Bradley that Committee response to SIR 403 stands.	Terry	5/31/21	

Attachment C – Back Burner / Reminders

	Item	Meeting Reference	Comments
5	Affirmativem subcommittee of experts in MS and other atom counting techniques to see that these techniques are adequately addressed in the radiochemistry module.	9/24/14	
6	From Action Item # 75: Prepare copy of Standard annotated with summary document language.		This is a project Carolyn was working on, but the committee decided it may duplicate the Small Lab Handbook. This project has been put on Hold.