Radiochemistry Expert Committee (REC)
Meeting Summary

February 27, 2013

1. Roll Call and Minutes:

Bob Shannon (chair) called the meeting to order at 2pmEST. Attendance is recorded in Attachment A – there were 8 members present. Associate members present: Terry Romanko, Virgene Mulligan, and Bill Ray.

The minutes from the January 16, 2013 meeting in Denver, CO were reviewed. After discussion, Larry provided a clarification to the section discussing 1.5.2: *Larry commented on the language in Section 1.5.2 that states that all procedures used to determine method detectable activity shall be documented. The concern is that the laboratory does not always have the exact details or source code for commercial software used for determining detectability. The committee agreed to revise this section to include a cross reference to software validation requirements in V1M2 Section 5.4.7.2.* This will be incorporated into the minutes. Carolyn motioned to approve the minutes with Larry's change and the motion was seconded by Marty. The motion passed and the minutes will be finalized and posted to the TNI website.

2. Standard Review

Review of Action Items

There were some action items for people to revise parts of the standard. Unfortunately, not everyone was on the call. Bob will follow-up with Nile and Richard to get the missing text for review at the next meeting. Carolyn and Tom would also like to review Richard's language before submission to the rest of the committee (added to action table).

Tom reviewed the work he did on his action item regarding terminology. He sent an e-mail summary to everyone this is provided in Attachment B. Carolyn commented that standard section 1.5.2.2 (b) has Minimum Detectable Activity (MDA) and Minimum Detectable Concentration (MDC). She asked if this would cause any problems. It was determined it would not.

Terry Romanko (associate) asked about using the term specific activity. Would it be possible that a sample analyte activity (picocurie per gram) could somehow be mixed up with the specific activity of a specific nuclide? Carolyn agreed this could be confusing and the term should be avoided. The committee agreed it will be avoided.

Keith commented that in MARLAP they used the term Minimum Detectable Value. This could be related to both activity and concentration. This could be an easier term to use. Carolyn was concerned about adding another term.

The committee turned to Section 1.5.3 of the standard to look for conflicts. Carolyn suggested that specific activity relates to both massic and volumetric activity and to change concentration to zero activity. Tom preferred to see this added to the standard and then see what it looks like before he agrees. This change impacts a lot of text.

A committee member asked about the use of the term MQO from MARLAP. Bob thought it was not being used but that it had originally come up since the group was talking about Data Quality Objectives (DQOs).

Tom would prefer to keep using activity concentration. It will serve the purpose in most situations. Bob took some text from the standard (1.4.3 a) and substituted this term: Precision and bias shall be characterized across the range of activity concentrations that bracket those that will be encountered in samples including zero concentration. Carolyn did not think the term concentration is needed – too wordy. Tom stated that a footnote or definition would be needed to state that wherever "activity" is used, it is actually "activity concentration".

Bob asked for a volunteer to take this concept and add the definition. The committee would look at changing the word "concentration" to "activity" after the definition is finalized. Vas will work on the definition and circulate information to the members.

Section 1.5.3:

d) Vas struggled with changing the language to make it more enforceable. There was a suggestion to add something about regulations (applicable regulations). Add a fourth category – Where there are no regulations, the laboratory shall establish such criteria in accordance with … Vas will work on the language and bring something back to the next meeting.

Section 1.5.4: Measurement of Uncertainty

a) No comments.

b) Tom had some concerns. He said, as per the DW standard, the detection limits are defined in terms of counting uncertainty, but he felt that it would not preclude reporting combined uncertainty. Carolyn thought this requirement for combined uncertainty was in the old standard too. Larry looked in the 2005 DW Certification Manual and noted that it specifically requires reporting counting uncertainties. Bob mentioned that since the detection limit is defined in terms of of the activity relative to the counting uncertainty, results would have to be reported in association with counting uncertainty to have meaning. He also pointed out that we cannot change DW requirements.

Tom asked Vas if he would cite a lab that reported combined uncertainty? Other members noted that they have seen other ABs citing labs for this. Vas said NJ would not cite the lab. He is finding that very few labs report total uncertainty – most report counting uncertainty. Several members disagreed. Terry Romanko emphasized that all larger commercial labs report combined standard uncertainty, and those labs working with DOE and DOD have to report combined uncertainty. Others are OK with only reporting counting uncertainties for DW, but agree that combined uncertainties should be required everywhere else.

Concerns were expressed because labs should be required to live up to common requirements. The language as currently written is meant to minimize confusion so that combined uncertainties are used for all testing outside drinking water. The hope is in the future, we will produce an audit checklist that will help communicate to auditors that combined uncertainties should be used for all measurements except drinking water..

The section will be left in as is.

c) No comments.

d) Vas has an issue with the wording. “Uncertainty estimates” – he has a problem with the term “estimates”. Everyone thought the word was appropriate and it is a commonly used expression.

Larry noted that he had concern that there is no information about what to do if the uncertainty "is statistically greater"? It only states that it shall not be statistically greater. The implication is that you can’t use the method or a lab may need to do a more complete uncertainty analysis.

The committee thought a sentence needs to be added. Perhaps add something like: … "reevaluate the uncertainty estimate components and calculations." Carolyn noted a similar statement would be needed in Precision and Bias if this change is made. Larry felt the Precision and Bias is a comparison and is clear. He does not feel the additional language is necessary and the committee agreed. Carolyn will send the committee some potential wording.

This change will be made to the standard.

1.5.5 Evaluation of Selectivity

This is the original text. Tom noted that selectivity can be looked at by looking for interferences. Vas stated that there are methods that are selective and some that are not. An example – gross alpha beta is a non-selective method. Selective methods have to follow steps to show selectivity and the standard needs some rewording.

Larry commented that when a lab is asked to show selectivity, they do this by analyzing reference materials, matrix spikes and PTs as available.

Bob said there is a FEM document (4.1) on radiochemical validation. The bar for demonstrating selectivity during validation would be set in the method scope which should indicate the "worst case" sample matrix that the method can method handle.

Tom noted there are different criteria to evaluate selectivity: scope, running samples and studying interferences. He thinks the criteria should be spelled out. Tom will work on some language and distribute it to the committee before the next meeting. Larry asked how the worst case matrix would be determined? Bob said that was up to the lab and that they would have to validate selectivity relative to that worst case. Bob will send a copy of the FEM language to Tom.

3. Committee Balance

Bob mentioned that the committee needs to be balanced. Vas raised the concern that perhaps more ABs are needed on the committee. There are fewer ABs (2) than Other (5) and Lab (4). Bob pointed out that Richard also has an AB background. Ilona noted that there is not one group that has voting dominance. This has been discussed with Bob Wyeth – chair of the Consensus Standards Development Executive Committee. Since the issue has been cleared by the Consensus Standards Development Executive Committee, Bob would prefer to leave the committee as it is formed.

4. Action Items

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

5. Next Meeting and Close

The next meeting is scheduled for Tuesday, March 27th at 2pm EST.

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

The meeting ended at 3:46 pm EST.

Attachment A
Participants
Radiochemistry Expert Committee

Members	Affiliation		Contact Information	
			Phone	Email
Bob Shannon (Chair) **Present**	QRS, LLC Grand Marais, MN	Other	218-387-1100	BobShannon@boreal.org
Tom Semkow (Vice Chair) **Present**	Wadsworth Center, NY State DOH Albany, NY	AB	518-474-6071	tms15@health.state.ny.us
Sreenivas (Vas) Komanduri **Present**	State of NJ Department of Environmental Protection Trenton, NJ	AB	609-984-0855	Sreenivas.Komanduri@dep.state.nj.us
Marty Johnson **Present**	US Army Aviation and Missile Command Nuclear Counting Redstone Arsenal, AL	Lab	865-712-0275	Mjohnson@tSC-tn.com
Dave Fauth **Present**	Consultant Aiken, SC	Other	803-649-5268	dj1fauth@bellsouth.net
Carolyn Wong **Present**	Lawrence Livermore National Laboratory Livermore, CA	Lab	925-422-0398	wong65@llnl.gov
Keith McCroan **Present**	US EPA ORIA NAREL, Montgomery AL	Lab	334-270-3418	mccroan.keith@epa.gov
Todd Hardt **Absent**	Pro2Serve, Inc. Oak Ridge, TN	Other	865-241-6780	HardtTL@oro.doe.gov
Nile Ludtke **Absent**	Dade-Moeller and Associates Oak Ridge, TN	Other	865-481-6050	nile.luedtke@moellerinc.com
Larry Penfold **Present**	Test America Laboratories, Inc. Arvada, CO	Lab	303-736-0119	larry.penfold@testamericainc.com
Richard Sheibley **Absent**	Sheibley Consulting, LLC	Other (Former AB)	651-485-1875	RHSHEIB111@yahoo.com
Ilona Taunton (Program Administrator) **Present**	The NELAC Institute	n/a	828-712-9242	Ilona.taunton@nelac-institute.org

Attachment B

From: Thomas M. Semkow [mailto:tms15@health.state.ny.us]
Sent: Tuesday, January 29, 2013 11:31 AM
Subject: Radiochemical concentration

Hi All,

It was a pleasure meeting you in Denver. The Chair has asked me to investigate the term "concentration" following the discussion we had. I have consulted IUPAC, BIPM, ISO, SI system, NIST, and ASTM. The results are interesting and unexpected to me. I present below a summary as well as details.

Thanks - Tom Semkow

Summary

It seems that the term "concentration" does not apply to activity because concentration implies quantity of a substance, whereas activity is the rate. "Activity concentration" is a term used extensively in radiochemistry. It is not strictly correct but, at least, it indicates that one is dealing with activity.

It appears that the correct terms are: massic activity (Bq/kg), synonymous with specific activity, and volumic activity (Bq/L).

Details

International Union of Pure and Applied Chemistry (IUPAC)

Concentration

Group of four quantities characterizing the composition of a mixture with respect to the volume of the mixture (mass, amount, volume and number concentration).

Mass concentration

Mass of a constituent divided by the volume of the mixture (kg/L).

Amount concentration

Amount of a constituent divided by the volume of the mixture (mol/L).
Volume concentration (volume fraction)

Volume of a constituent of a mixture divided by the sum of volumes of all constituents prior to mixing (dimensionless).

Number concentration

Number of entities of a constituent in a mixture divided by the volume of the mixture (1/L).

Substance content
Amount-of-substance of a component divided by the mass of the system (mol/kg).
Specific activity

For a specified isotope, or mixture of isotopes, the activity of a material divided by the mass of the material.

ISO 31-0: 1992. Quantities and Units - Part 0: General Principles, Units and Symbols; superseded by ISO 80000-1:2009. Quantities and Units: Part 1: General.

Massic

Attribute to a physical quantity obtained by division by mass; synonymous with specific.

Volumic

Attribute to a physical quantity obtained by division by volume.

ASTM WK35988. Standard Terminology for Radiochemical Analyses.

Activity concentration, (1) quotient of the activity of a specified quantity of material and its volume; volumic activity; (2) quotient of the activity of a specified quantity of material and its associated mass or size.

Volumic activity, quotient of the activity of a quantity of material and its volume - also called activity concentration.

Massic activity, quotient of the activity of a quantity of material and its mass. The term specific activity is often used to mean the massic activity of a pure substance, such as a radionuclide, element, or compound.

Attachment C

Action Items – REC

	Action Item	Who	Target Completion	Actual Completion
1	Nile will prepare language for Section 1.5.1 and propose a revision to 1.2.	Nile	2-26-13	
2	Richard will look at all of 1.5.2 (including 1.5.2.1) and propose some new language. He will review it with Nile before submitting to committee. (2/27/13: Carolyn and Tom also asked to review this before submission to the committee.)	Richard	2-26-13	
3	Richard will prepare language update for 1.5.3 and submit to committee.	Richard	2-26-13	
4	Tom will research terminology on activity, activity concentration, etc.	Tom	2-26-13	
5	Define “activity concentration” and note that when the word activity is used, it means activity concentration. . The committee will look at changing the word “concentration” to “activity” after the definition is finalized. Circulate to committee members and Ilona.	Vas	3-21-13	
6	Work on language for 1.5.3. Circulate to committee and Ilona.	Vas	3-21-13	
7	Work on language for 1.5.4 d). Circulate to committee and Ilona.	Carolyn	3-21-13	
8	Work on language for 1.5.5. Circulate to committee and Ilona.	Tom	3-21-13	
9				

Attachment D

Backburner / Reminders – REC

	Item	Meeting Reference	Comments
1	Update charter in October 2013	n/a	
2	Issue of noting modifications to methods.	1/16/13	
3	Look at batching when QC is looked at.	1/6/13	