

March 6, 2008

Combined Comments of the RAC's MARSAME Review Panel

(F:/user/jkooyoom/RAC/MARSAME/MARSAME March 10, 2008 PRE MEETING COMMENTS /Duvall
Cover Note to Kooyoomjian and Johnson Re Jan 7, 2008 Edits030408.rtf)

Duvall Cover Note of March 3, 2008

Dear Jack:

I have reviewed the recent 2/27/08 SAB Draft Report. I have only one concern. The 1/07/08 comments I submitted on the 12/17/07 SAB Draft Report were not fully adopted in this recent SAB draft. I have attached my 1/07/08 comments once again for reference in this discussion. Comments 3 and 4 on Figs 6.3 and 6.4 were incorporated into the recent SAB draft. However, Comments 1, 2, and 6 were not. I believe these comments have merit and provide added value to the SAB report. Comment 1 on the MQO Guide, Comment 2 on the MARSAME Process, and Comment 6 on Decontamination as a means to meeting disposition options, I thought, were well-received by the panel and the MARSSIM work group and would provide significant improvement to the MARSAME guidance. I would like to understand the rationale as to why these comments were not adopted. My preference would be that these comments are addressed and incorporated into the report. Please indulge me with a response to this discussion.

Thanks ken

From: duvall100@verizon.net
Date: 2008/01/07 Mon PM 02:07:34 CST
To: janetj@sopris.net, kooyoomjian.jack@epa.gov
Subject: Comments on Draft 01/07/08

Dear Jan and Jack:

Attached are comments on the Draft Report, as requested, which include statements to be inserted into the document. All attached items are current or revised. I look forward to your response. Ken

Comments
01/07/08
Ken Duvall

Suggested Statements to be inserted into Draft Report:

1. SUGGESTION 2a-3: The application of procedures for determining measurement uncertainty, detectability, and quantifiability is essential to the design of the disposition survey. The ability to set Measurement Quality Objectives (MQOs) is an important element of the MARSAME process. The discussion provided involving the implementation of MQOs in the design of the

- three survey types may be confusing to the reader. Aspects of implementation are immersed in details defining, explaining, and deriving theoretical concepts. An organized summary or guide, inserted in Chapter 5, that focuses on the procedures for setting MQOs and for determining uncertainty, MDC, and MQC is suggested. An example of an organized summary is provided in Appendix D-4 of this report. Also, discussions on Setting MQOs, in Sections 5.5 thru 5.9, would be better served in Chapter 4: Survey Design.
2. SUGGESTION 3-7: The MARSAME is a multi-step process that proceeds through planning, conducting, assessing, and deciding stages. It is important for the reader to be able to put its “arms around the process” by visualizing the full extent of the process on one page of the Roadmap. Figures 1 thru 8 are flowcharts that provide the details of the process, however a single chart summarizing the major activities, in the framework of the Data Life Cycle, would be useful to the reader. An example of an organized chart is provided in Appendix D-1 of this report.
 3. SUGGESTION 2b-1: *In Fig. 6.3, clarify the distinction of a MARSSIM-type survey by moving “Start” to immediately above the decision point “Is the Survey Design-Scan Only of In-situ?”. If “no”, this decision leads to “MARSSIM Survey Figure 6.4”. If “yes”, then connect this to the decision point “Is the AL equal to zero or background?”. For the decision point “Is the AL equal to zero or background?”, a “yes” leads to “Requires Scenario B” and a “no” leads to “Disposition decision based on mean”. An example of the revised Fig. 6.3 is provided in Appendix D-2 of this report.*
 4. SUGGESTION 2b-2: *In Fig. 6.4, for a more consistent presentation, insert a decision diamond at “Perform the sign test” and “Perform the WRS test” that says “Use Scenario A” at both locations, followed by a “yes” or “no” leading to the two branches at both locations. The “yes” or “no” legs from the decision diamonds in both branches lead to information boxes. In the first branch, the two boxes should state “Perform the Sign Test” and in the second branch, the two boxes should state “Perform the WRS Test”. An example of the revised Fig. 6.4 is provided in Appendix D-3 of this report.*

5. TABLE OF CONTENTS

Appendix D – Additional Information

- D-1 The MARSAME Process
- D-2 Revised Figure 6.3
- D-3 Revised Figure 6.4
- D-4 Guide to Application of MQOs

$$\sigma = 0.3 \text{ UBGR} \quad \text{for } \alpha=\beta=0.05 \text{ when background present} \quad (\text{Sec. 5.5})$$

2. MDC < AL (Simplest Case)

$$S_c = 2.33 \sqrt{N_B} \quad \text{for } \alpha=\beta=0.05 \text{ and } t_B = t_s \quad (\text{Table 5.1})$$

$$S_d = Z_{1-\beta} \sigma^2 + 2 S_c = 2.71 + 4.66 \sqrt{N_B} \quad \text{for } \alpha=\beta=0.05 \text{ and } t_B = t_s \quad (\text{Table 5.2})$$

$$\text{MDC} = S_d / t_s \epsilon \quad \text{where } \epsilon \text{ is (counts/sec) / (Bq/cm}^2\text{)} \quad (\text{Section 5.7.3})$$

SCAN-ONLY - Scanning Measurements

MQOs: σ & Scan MDC

1. σ at AL where $\sigma^2 = \sigma_m^2 + \sigma_s^2$

$$\text{For 100\% Scans } \sigma_s \text{ is negligible; } \sigma^2 = \sigma_m^2 \quad (\text{Sec. 5.5.1})$$

$$\text{For 10\% to nearly 100\% Scans: } \sigma_m \text{ made negligible if } \sigma_m < \sigma_s / 3 \quad (\text{Sec. 5.5.1})$$

2. Scan MDC < AL

$$\text{MDCR} = (d \sqrt{b_i}) (60 / i) \quad (\text{MARSSIM Sec. 6.7.2.1})$$

$$\text{Scan MDC} = \text{MDCR} / (\sqrt{p}) \epsilon \quad (\text{probe area} / 100 \text{ cm}^2); \quad \text{dpm/cm}^2$$

(Bq/kg see MARSAME Sec. F.6)

MARSSIM-TYPE - Sampling Measurements

MQOs: σ & MQC

1. σ at AL where $\sigma^2 = \sigma_m^2 + \sigma_s^2$

$$\sigma_m < 0.1 \Delta \quad \text{where } \sigma_s \text{ is unknown} \quad (\text{Sec. 5.5})$$

2. MQC < AL

$$Y_Q = [K_Q / 2 t_s \epsilon (1 - K_Q^2 \Phi_s^2)] [1 + \sqrt{\{1 + (4(1 - K_Q^2 \Phi_s^2) / K_Q^2) (N_B t_s / t_B (1 + t_s / t_B))\}}] \quad (\text{Sec. 5.8.1})$$

$$\text{MQC} = C \times Y_Q \quad \text{in (Bq/cm}^2\text{)}$$

Ken Duvall 01/07/08

(F:/user/jkooyoom/RAC/MARSAME/MARSAME March 10, 2008 PRE MEETING COMMENTS /Kahn Suggestions to Johnson and Duvall Edits030408)

Bernd Kahn's March 4, 2008 Comments on Jan Johnson's Jan 7, 2008 Edits

Dear Jan:

I have looked Ken's suggestions over carefully and have the following responses concerning the six items that he listed:

- 1.Suggestion 2a-3: A good proposal; let us insert it in the review.
- 2.Suggestion 3-7: This idea has been excerpted in Suggestion 3-1.
- 3.Suggestion 2b:1. This is already in the review; see also the figure on p. 14.
- 4.Suggestion 2b: This is already 8in the review; see also the figure on p.15.
- 5.Is Ken referring to Appendix G instead of D, which concerns instrumentation?
- 6.Suggestion 1c-2: A good proposal; let us insert it.

Concerning the equations for Chapter 5, we should ask Tom and Dan whether they wish to incorporate them in Appendix A. The MARSAME Process figure is a clear summary of parts of chapter 1, which is also clearly presented. We could certainly suggest its insertion if the Panel thinks more clarity is needed.

I would appreciate your advice concerning all of these suggestions.

Regards,
Bernd

(F:/user/jkooyoom/RAC/MARSAME/MARSAME March 10, 2008 PRE MEETING COMMENTS /Johnson Cover Note to Kahn Re Duvall's MARSAME Process Chart Jan 7, 2008 Edits030508.rtf)

**Jan Johnson Cover Note March 5, 2008 Re Duvall's Chart Depicting the
MARSAME Process**

Dear Bernd,

I have had some critical deadlines this week so have not yet had a chance to review the whole report but I have had some conversations with Jack.

Should we include Ken's overview of the MARSAME process in the report?

(F:/user/jkooyoom/RAC/MARSAME/MARSAME March 10, 2008 PRE MEETING COMMENTS /Kahn
Cover Note to Johnson Re Duvall's Chart Depicting MARSAME Process030608)

**Kahn Comments of March 6, 2008 to Johnson Re Duvall's Chart Depicting the
MARSAME Process**

Dear Jan:

I referred to that item in my last sentence of the email that I sent you last week. The figure is a clear description of the process, but the MARSAME manual presentation also is clear on this process. I will leave it to panel members to decide whether it adds anything to the manual or is just an indication that, 'yes, we get the point'.

Regards,

Bernd

(F:/user/jkooyoom/RAC/MARSAME/MARSAME March 10, 2008 PRE MEETING COMMENTS /Fry
Suggested Edits to Kahn030608)

**MARSAME Manual : RAC Panel Review, Feb. 27, 2008 draft. (Fry -
March 6, 2008)**

Letter to the Administrator:

Pg 1, ln 34 : re. '....case studies..'- suggest revising to '...(invented; hypothetical) illustrative examples... ' for consistency with revised text

Pg 1, ln 40 : insert 'the' between 'from' and 'several' i.e. '...from the several agencies....'

Pg 2, ln 20 : suggest revising for clarity: ' Present the various alternative forms of (alternatives for) M&E surveys...'

Pg 2, ln37 : delete '...to you.' – redundant

'RAC Members' listings:

Pg ii, ln 28: please correct here and permanently in master list: Dr. Shirley A. Fry, ~~M.B., B.Ch., MPH~~ when using Dr. title, please do not include trailing credentials (repeated correction request)

1. Executive Summary:

Pg 1, ln 15: revise as shown ‘ All (of) these manuals were **prepared collaboratively** by a multi-agency work group **comprising** (that is a joint effort by) staff members of’

Pg1, ln 34 : revise as shown : ‘(The review by the RAC’s Marsame Review Panel) **It** is based on **the Panel’s** reading of the *MARSAME Draft*’

Pg 1, ln 37 : Capitalize ‘...**M**arch..’

Pg 1, ln 43 : re. comprehension : ‘ ...for modifications address only a small fraction of this product.’ - to me this reads as though the Panel only looked at parts of the Manual which is not so - does it mean to say that : ‘... the Panel **suggested modifications** in only a small fraction of this product ‘ (i.e. in the Panel’s opinion, the product needed few modifications)?

Pg2, ln 28 ; correction ?? : ‘ (null **hypotheses** for Scenario A and Scenario B) - null hypothesis for Sc. 1 is different to (opposite of) the one for Sc. 2 – therefore plural in this phrase ???

2. Introduction.:

Pg 3, ln 11 : revise : The document was **prepared collaboratively** by staff from the following.....’

Pg 4, ln 27 : tense ? : “if the review and background materials provided **were** (are) adequate....’

Pg 4, ln 34 : insert ‘previously’ between ‘.... (SAB)...’ and ‘...conducted..’ to read ‘ (SAB) previously conducted.....’

Pg 4, ln43 - pg 5, ln 3 : re comprehension – to me this reads like a series of *non-sequiturs* (although I realize this is unintended and probably is because I do not fully understand the relationships between the entities identified in the paragraph) – for discussion.

4. Response to CQ1.....

Pg 8, ln 24 : separate /....

Pg 9 , lns 25-35 : uncapitalize ‘Sentinel’ throughout this paragraph except at the beginning of a sentence (ln 28)

Pg 9, ln 33 : revise to read : ‘As indicated in the MARSAME Manual (draft, line 258), sentinel measurements should not..... .’

Pg 11, ln 33 : delete capital S in ‘**S**sentiel’

Web-based Citations

Pg 21, lns 4, 6, 8 : reorder citations in sequence of reports: MARLAP; MARSSIM;
MARSAME

Appendix B

Pg 34, lns 12, 13, 14: lower case 'b' in 'becquerels...'

Pg 34, ln 36 : lower case 'h' in '.... hydrogen...'

Pg 35, ln13 : lower case 's' in 'milli-seivert'

Pg 35, ln 41 : lower caase 't' in '....thallium...'