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|----|--|----------------------|-------------|-----------------|---|
| 1  | <b>Comments on Panel's draft REM Review Report dated 10-Aug-2005</b> |                      |             |                 |   |
| 2  | <i>Section</i>   | <i>Starting page</i> | <i>Line</i> | <i>Category</i> | <i>Comment</i>  |
| 3  | Cover letter   | 2                    | 27          | Editorial       | Insert "on": "a meeting <u>on</u> February 7, 8, and 9"   |
| 4  | Cover letter   | 2                    | 44          | Technical       | Suggested main recommendations for Draft Document: (1) clarify categories of model users addressed by this document; (2) aim for consistency in model terminology; (3) emphasize the role of stakeholders throughout an iterative process; (4) emphasize the need for the decision-maker to clarify the role of model uncertainty in making a decision for the problem addressed; (5) include case studies.   |
| 5  | Cover letter   | 2                    | 44          | Technical       | Suggested main recommendations for MKB: (1) Clarify and elicit additional information on models, particularly relating to peer reviews, benchmarking studies, limitations and needs for improvement; (2) provide incentive for model developers to conduct model evaluations, and for model purveyors to communicate the results of those evaluations; (3) provide mechanism to actively solicit feedback from the user community regarding model application and performance.  |
| 6  | Cover letter   | 2                    | 44          | Technical       | Crosscutting recommendation: The Agency should strive to follow its own standard quality assurance procedures for ensuring the accuracy and completeness of information entered into the MKB system.  |
| 7  | Cover letter   | 3                    | 14          | Editorial       | Correct number for this Charge Question: 2  |
| 8  | Cover letter   | 3                    | 19          | Editorial       | Correct number for this Charge Question: 3  |
| 9  | Cover letter   | 3                    | 24          | Editorial       | Correct number for this Charge Question: 4  |
| 10 | Cover letter   | 3                    | 38          | Editorial       | Correct number for this Charge Question: 5  |
| 11 | Cover letter   | 4                    | 1           | Editorial       | Correct number for this Charge Question: 6  |
| 12 | Cover letter   | 4                    | 8           | Editorial       | Correct number for this Charge Question: 7  |
| 13 | Cover letter   | 4                    | 14          | Editorial       | Insert "(3)": "and (3) NWPCAM...."  |
| 14 | Abstract   | 7                    | 3           | Query response  | In response to TLT's query: From my perspective, the Abstract differs from the Executive Summary in two significant respects: (1) The Abstract is required for SAB documents and is subject to length restrictions. The Executive Summary is optional and not restricted in length; it is usually included for a long or complex report but may be redundant if the report includes a well-written concluding section. (2) The Executive Summary should address all aspects of the charge, but the abstract need only address major findings. Note: Our report does not yet have a concluding section; whether or not it needs one may be an appropriate topic for panel discussion (or could just be an executive decision made by the panel chair). |
| 15 | Abstract   | 7                    | All         | Technical       | Suggested main recommendations: same as those suggested above for the cover letter  |

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| 16 | Contents          | 11 | 32    | Editorial | My preference would be for all references to be gathered in one section, rather than listed separately for each individual section. I like the idea of providing a separate listing of additional references that are not cited in the report.  |
| 17 | Contents          | 11 | n/a   | Editorial | Item for Panel discussion?: transmit June's list of compiled comments directly to EPA (with a cover memo), or include a shortened version of it as an appendix to the panel report (i.e., edited to remove purely editorial comments)?  |
| 18 | Executive Summary | 12 | 6     | Editorial | Contrary to this sentence, our draft report is not consistent in using the term " <i>Draft Guidance</i> ." Terms used instead include: Guidance Document, REM Guidance Document, REM Guidance, document, and guidance. This is probably not a significant problem because it is always clear what document is being referenced; but I suggest that a "search and replace" be conducted to ensure the inclusion of the qualifier "draft." Also, should "Draft Guidance" be capitalized and italicized wherever used in our report, as one would do for the title of a book or journal? |
| 19 | Executive Summary | 12 | 7     | Editorial | Insert left parenthesis before "referred." Don't italicize words inside parentheses, other than MKB.  |
| 20 | Executive Summary | 12 | 7     | Editorial | Should the Executive Summary just provide "major points of consensus," or should it rather present "major findings and recommendations," which sounds more definitive?  |
| 21 | Executive Summary | 12 | 11    | Technical | Insert words: "provides a much needed vision for standardizing and documenting the role of modeling across all EPA offices."  |
| 22 | Executive Summary | 12 | 13    | Technical | There is no supporting discussion of this aspect in the main body of the report, e.g., specifically to what previous SAB advice has the Agency been responsive? At a minimum, the SAB reports containing that advice should be cited.   |
| 23 | Executive Summary | 12 | 17    | Technical | Suggested rewording: "and <b>the Panel hopes that</b> it will be read and used by...." Later in the report, the Panel may want to make a recommendation concerning how the Agency might encourage its employees to read and implement the guidance document, e.g., by holding regional workshops.   |
| 24 | Executive Summary | 12 | 19    | Technical | Insert word: "who come from federal, state, <b>local</b> , and private sectors."  |
| 25 | Executive Summary | 12 | 20-22 | Technical | Meaning of this sentence is not clear. Possible rewording to clarify: "However, parts of the document may only be comprehensible to limited constituencies: those who develop models, those who "use" models by providing input data or parameters or by generating output, or those who use model results as the basis for making a regulatory decision." If this is what the writer intended, I'm not sure I agree with this assessment. Item for panel discussion?   |

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| 26 | Executive Summary | 12  | 22-24 | Technical | I agree that the document needs to clarify what is meant by the term "model user", but beyond that I'm not convinced that the document needs to clarify how different audiences can use the document beneficially. If this recommendation is retained, it would be useful to provide a couple specific examples (in section 2.1, page 21) of the type of clarifications envisioned.        |
| 27 | Executive Summary | 12  | 27    | Technical | Reword: "It is recommended that these inconsistencies be <b>resolved</b> through developing and using a common reference, <b>such as the Modeling Glossary posted on the Agency's CREM home page (<a href="http://cfpub.epa.gov/crem/">http://cfpub.epa.gov/crem/</a>)</b> ."  |
| 28 | Executive Summary | 12  | 31    | Technical | Reword: In the Panel's view, <b>the successful use of models to address regulatory environmental problems</b> requires that the specifics of the problem posed be explicitly stated and agreed upon by stakeholders <b>as early in the process as possible</b> , and that the problem specifications be used <b>thereafter</b> to guide ....."   |
| 29 | Executive Summary | 12  | 35    | Editorial | Replace xx with 7 and move page citation: "the Panel suggests an alternative version of Figure 1 (on page 7 of the Guidance Document), in which..."  |
| 30 | Executive Summary | 12  | 41    | Technical | Reword: "The Panel strongly concurs with the Draft Document on the importance of defining, evaluating and communicating model uncertainties, both for establishing bounds on our understanding of a system as well as for presenting results to decision-makers."  |
| 31 | Executive Summary | 12  | 40+   | Editorial | This paragraph could benefit from being written more succinctly, in keeping with the to-the-point nature of the rest of the Executive Summary.   |
| 32 | Executive Summary | 13  | 22    | Technical | Reword: "This type of resource has been needed for some time, <b>and the Agency is the most logical and appropriate entity to be its progenitor and steward</b> . The Panel notes that, even in its draft form, the Knowledge Base provides an easily accessible resource for the modeling community. If <b>expanded</b> , maintained and used, the MKB could significantly improve ....." |
| 33 | Executive Summary | 13  | 20+   | Editorial | This paragraph could benefit from being written more succinctly, in keeping with the to-the-point nature of the rest of the Executive Summary.   |
| 34 | Executive Summary | 14  | 7     | Editorial | Fix typo and edit: "should follow <b>its</b> own quality assurance procedures for ensuring the accuracy and completeness of information entered into the MKB system."  |
| 35 | Executive Summary | 14  | 11    | Technical | Lessons learned from the specific experiences of Panel members should be summarized here, or else this paragraph should be dropped from the Executive Summary.   |
| 36 | Main text (all)   | All | All   | Editorial | I suggest that we routinely position each recommendation at the beginning of a paragraph, rather than having it sometimes in the beginning, sometimes in the middle, and sometimes at the end. I think this convention makes the document more reader-friendly and more likely to remember the main points.  |

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| 37 | 1.0 | 15 | 9+    | Technical | Issue for Panel discussion? The interpretation of "best available, practicable science" that is expressed in this paragraph seems to me to be confused with the definition of a "graded approach." I don't see the two concepts as being interchangeable, which seems to be the implication here. I suggest deleting this paragraph.  |
| 38 | 1.1 | 15 | 30-31 | Editorial | Reword: "provides a comprehensive <b>yet concise</b> overview of modeling principles and best practices."   |
| 39 | 1.1 | 15 | 33-35 | Editorial | Delete this sentence; it seems presumptuous to suggest or assume that the Panel will continue to have a role on revising the Agency's draft guidance after submission of the Panel's report to the Administrator.   |
| 40 | 1.1 | 15 | 38    | Editorial | Spell out QAPP here   |
| 41 | 1.1 | 15 | 40    | Technical | Reword: "...ongoing peer review through all stages of the modeling process, <b>including problem specification, and</b> not just after model <b>development and</b> application."   |
| 42 | 1.1 | 15 | 31-32 | Technical | There is no supporting discussion of this aspect in the main body of the report, e.g., specifically to what previous SAB advice has the Agency been responsive? At a minimum, the SAB reports containing that advice should be cited.   |
| 43 | 1.2 | 16 | 9-13  | Technical | Issue for Panel discussion? Reword to clarify: "The term 'application tool' in section 2 of the Draft Document refers to the application of a model to a specific environmental problem, whereas 'model application' in section 4 of the Draft Document refers to the consideration of model results by decision-makers. Accordingly, the Panel suggests that the term 'application tool' be replaced by <b>a less ambiguous term, such as</b> 'problem-specific application.'" <b>Note: this rewrite still doesn't clarify the meaning for me. Do we have any recommendations following the Panel's discussion on the different interpretations of "model framework"? At one time, did we discuss replacing "model framework" with "model formulation" in section 2?</b> |
| 44 | 1.2 | 16 | 24-27 | Technical | Reword to clarify: "The alternative figure is intended to better reflect the central role of stakeholders in the public policy process, and to suggest their multiple points of interaction in the modeling process. It is also intended to better capture the iterative nature of the process of model development, review and application."   |
| 45 | 1.2 | 16 | 37-38 | Technical | Clarify: "The <b>two paragraphs</b> on Data Quality Objectives (DQOs) <b>starting on the bottom of page 9</b> of the Draft Document..." Question for panel discussion: It is not clear to me what additional information is requested by the Panel about desired accuracy and precision, beyond what the Draft Document already states in its second DQO paragraph (end of section 2.1 on page 10): "Included in these [DQOs] should be a statement about the acceptable level of total uncertainty that will still enable model results to be used for their intended purpose."  |
| 46 | 1.2 | 16 | 41    | Editorial | Clarify: "Under <b>Scope of Guidance</b> (section 1.3 of the Draft Document),..."   |

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| 47 | 1.2 | 16 | 41-45 | Technical | Issue for Panel discussion? If the suggested changes about model types are directed at section 1.3 of the Draft Document, then I don't think that these changes would add any value to the Draft Document, and suggest that this bullet be deleted from the Panel's report. On the other hand, if the suggested changes are intended to be incorporated into a new section on Problem Specification, then they might be appropriate to retain (e.g., as aspects that one might want to specify in the specifications). |
| 48 | 1.3 | 17 | 23-24 | Technical | Issue for Panel discussion? Presumably increased attention on calibration is being recommended for section 2.4 of the Draft Document, but we need to clarify where increased attention is needed in the appendices. Calibration is mentioned in Box 3 in Appendix B, but I <b>couldn't find any mention of it in Appendix C. Is the Panel recommending the inclusion of a new section in C, or the revision of an existing one?</b>  |
| 49 | 1.3 | 17 | 29    | Technical | Reword to clarify: "the number of uncertain parameters in the model exceeds the number of state variables for which data are available for calibration."   |
| 50 | 1.3 | 17 | 34    | Technical | Need to clarify what is meant by "parameterization by calibration"   |
| 51 | 1.4 | 18 | 1-5   | Technical | Reword for better flow and emphasis: "The current trend towards adaptive management of natural resources greatly elevates the importance of model post-auditing and the need for guidance on how to implement this step efficiently and effectively. <b>For this reason, the Panel recommends that the Draft Document add a new subsection in the model application section, on the value of model post-auditing and the need to provide resources for associated data collection.</b> "                               |
| 52 | 1.5 | 18 | 10    | Technical | Not sure what is meant by "model framework" in this case. However, the entire first sentence could probably be deleted without losing any information needed to support the rest of the paragraph.   |
| 53 | 1.5 | 18 | 17-25 | Technical | We should revise our alternative Figure 1 to match the steps recommended here (or vice versa).   |
| 54 | 1.5 | 18 | 19    | Editorial | Replace "recognize" with "point out"   |
| 55 | 2.0 | 20 | 19    | Technical | Reword to clarify: "Problem specification supplies the modeling objectives <b>and constraints</b> that <b>thereafter guide implementation</b> of the modeling steps described in the Draft Document"   |
| 56 | 2.0 | 20 | 15-18 | Editorial | Should these 2 sentences be put in bold the same as recommendations?   |

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| 57 | 2.1 | 20 | 24-35 | Technical | Reword paragraph 1 and the first part of paragraph 2 to clarify: "The Draft Document identifies the intended audience as being composed of two general categories: model developers and model users. Upon closer reading, however, other important modeling constituencies are explicitly or implicitly identified, each with distinctly different roles in the modeling process, leading the Panel to conclude that the term 'model user' is overly broad and imprecise. For this reason, the Panel recommends that the Draft Document elaborate on the distinction between the model users who...."            |
| 58 | 2.1 | 21 | 1-3   | Technical | I agree that the document needs to clarify what is meant by the term "model user", but beyond that I'm not convinced that the document needs to clarify how different audiences can use the document beneficially. If this recommendation is retained, it would be useful to provide a couple specific examples of the type of clarifications envisioned.  |
| 59 | 2.2 | 21 | 32    | Editorial | Reword: "However, there is room for improvement and a need for better consistency, ...."   |
| 60 | 2.2 | 21 | 36    | Editorial | Insert comma after "guidance"  |
| 61 | 2.2 | 21 | 38-39 | Technical | I am not clear on what is meant by this recommendation: "The Panel recommends that the Agency clarify the document's use of terminology and definitions that may not always agree with past Agency usage." Is the Panel requesting the inclusion of a blanket statement in the Glossary warning readers of inconsistencies? or explicit recognition and discussion of known inconsistencies? Suggested resolution: delete this sentence in this paragraph since it is elaborated upon in the following one (starting on page 21, line 45). Combine the two paragraphs since they seem to address the same issue. |
| 62 | 2.2 | 22 | 16-23 | Editorial | This paragraph belongs in section 2.1 on Scope of Use  |
| 63 | 2.2 | 22 | 25-33 | Editorial | This paragraph arguably belongs in section 7 on MKB.   |
| 64 | 2.2 | 22 | 35-40 | Editorial | This paragraph belongs in section 2.1 on Scope of Use  |
| 65 | 2.2 | 23 | 7-10  | Editorial | This recommendation belongs in section 2.1. I suggest creating a new paragraph and inserting a new introductory sentence: "According to the EPA's CREM home page, ' <i>The Models Knowledge Base is intended to be a living demonstration of the recommendations from the Guidance for Environmental Models. In this way, these two products work in tandem to describe and document good modeling practices.</i> ' In pursuit of this goal, <b>the Panel recommends that the Draft Document clearly articulate the broad range of model types....</b> "   |
| 66 | 2.3 | 23 | 15-21 | Technical | This paragraph seems to require additional discussion among Panel members to clarify the recommended action to be taken.   |
| 67 | 3.0 | 24 | 9     | Editorial | Change section number to 3.0   |
| 68 | 3.0 | 24 | 12    | Editorial | Reword second sentence to clarify: "Usually the Draft Document expresses the use of a graded approach implicitly through the use of the descriptor, "appropriate."   |

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| 69 | 3.0 | 24 | 22-23 | Editorial | Delete the last part of this sentence, "described in the panel discussion of Charge Question #1" |
| 70 | 3.0 | 24 | 24    | Editorial | Insert words: "a brief discussion with examples of how..."                                       |