

U.S. Environmental Protection Agency
Science Advisory Board
Multimedia Multipathway Multireceptor Risk Assessment (3MRA)
Modeling System Panel

Minutes of Public Conference Call Meeting January 16, 2004

Committee: Multimedia Multipathway Multireceptor Risk Assessment (3MRA) Modeling System Panel of the U.S. Environmental Protection Agency's Science Advisory Board (SAB). (See attached Roster)

Date and Time: January 16, 2004 1-5 p.m., Eastern Time (See attached Federal Register Notice)

Location: Science Advisory Board, Room 6450Z, Ariel Rios North, 1200 Pennsylvania Ave, Washington D.C.

Purpose: The purpose of the conference call was to allow the Panel to complete discussion of its second draft report. This discussion was begun at the December 15, 2003 public teleconference meeting.

Materials Available: In addition to the materials distributed before the December 15, 2003 conference call meeting, the Panel, the Agency and Public had received the original and revised agendas for this conference call, draft minutes for the December 15 conference call meeting, additional material from EPA on uncertainty, public comment forwarded by the American Chemistry Council, and material on module ranking collected and interpreted by Smith and Boissevain. Per the Panel's agreement, individual exchanges relating to particular parts of the report were not circulated to all. However, all these materials will be available in the FACA file and can be distributed on request. No additional written public comments were made available before this conference call.

Attendees: All panelists participated in this call. A list of participants, including the Agency and the Public, is attached to these minutes.

Summary

The actions resulting from this meeting were:

1. Writers will send additional changes to question integrators soon.
2. Question integrators will distribute revised responses by February 2.
3. Panelists will read revised material and be prepared to comment on the February 6 conference call.
4. Maddalena's notion that 3MRA cannot be used alone to determine long range transport of chemicals will be incorporated in the response to 3B.

5. Carlisle offered to send additional material on the response to Question 2 to Murarka.
6. Boissevain will provide DePinto with text on how 3MRA does data aggregation and what impacts the Panel thinks it might have for Q3a.
7. Thibodeaux will provide DePinto with some additional comments, which DePinto may use in the text (currently page 3) if he felt comfortable elaborating on this a bit in the next draft, perhaps where text is now on page 3. DePinto was thinking of putting this in the appendix. Thibodeaux agrees this type of model comparison is time consuming and the Panel should not push the EPA to that limit. Murarka's revised response to question #2 contains some material which may end up in DePinto's revised response to question 3.
8. Merrill will provide Theis with some text for the response to question 1.

The following is a more chronological and detailed account of the meeting.

At 1 :00, SAB DFO Kathleen White opened the meeting. She called the roll of the Panel, expected Agency staff, and the public. (The list of attendees is attached.) After welcoming those present, she reminded them that this is the ninth meeting of a specially formed panel of the EPA Science Advisory Board will review the 3MRA Modeling System. The next two will be February 6 and 27. She then asked the permission of those present to skip items have been said at previous conference calls and face-to-face meetings and emphasize the two new items. All appear below.

1. (New) Since the last meeting, there have been two fact-finding calls each including a subset of panelists and relevant Agency staff to allow the panelists to better understand the facts relating to specific areas. These were the January 9 conference call on the 2 km radius which included panelists Boissevain, Brown, DePinto, Maddalena and Theis and Agency staff Donna Schwede and Steve Kroner and the January 16 conference call on uncertainty which included panelists Carlisle, Carbone, Merrill, and Theis and Agency staff Babendreier and

There were two conference calls where subsets of the Panel interacted with EPA staff to get additional information. One on the 2 km radius on January 9 and one on uncertainty January 12. The DFO was present on these calls and her notes will be appended to minutes for this conference call.

2. (New) Since this Panel began its work, the SAB has reorganized. In the past, as part of the SAB's routine process for insuring the quality of the reports it provides to the Agency, the Panel's report would have been sent directly to the Executive Committee for review before being transmitted to the Administrator. In the new structure what was the Executive Committee is now a larger body called the Board; that Board has the option of using a Quality Review Committee to review and provide input on important SAB products. Former EEC chair, now Board Vice Chair, Domenico Grasso will work with SAB Deputy Director for Science Tony Maciorowski to organize that review using existing members. This could

occur in the April-May time frame if the Panel can complete its work fairly soon. Because this is a new process and a new organization, the DFO has no additional insights to provide about the mechanics of the process or those additional people likely to be involved in it.

3. (Old) The activities of the Science Advisory Board are governed by the Federal Advisory Committee Act, other government regulations (such as those on conflict of interest) and SAB policies.
4. (Old) In accordance with those policies, this panel was formed using a widecast (FR dated April 11), a short list was posted June 20, and, after consideration of the comments received and the review of confidential financial disclosure statements, the current panel was formed. All panelists have completed a course on government ethics prepared especially for Special Government Employees, like themselves. The panelists introduced themselves at the first conference call and their biosketches are available at the SAB website. In the interests of saving time, the introductions will not be repeated on today's call.
5. (Old) The SAB website (www.epa.gov/sab) has materials relating to the 3MRA review and about panel formation.
6. (Old) All materials available to the Panel will be available to the public. Individuals wishing to be on the DFO's distribution list for materials relating to this review should send an email to that effect to the DFO (white.kathleen@epa.gov) who will add them to her list.
7. (Old) Public comment is accepted at SAB meetings. .
8. (Old) All consensus drafts, and possibly earlier drafts, will be available to the public and the Agency.

Theis welcomed the panel and introduced the agenda. He hoped that the Panel would at least get through the whole report today and plans to ask the panelists to get any final changes to the chapter integrators by February 3. He will also ask each question organizer to identify the material that should go into an appendix; the chair will organize the appendices. Carbone asked whether the lead time for the panelists could be increased by a week; writers could have a couple of weeks to send in changes by January 27, but that was difficult for one panelist. After discussion the target date was set at February 2.

The chair asked Brown to summarize the January 9 preparatory call on the 2 km radius and Carlisle and Merrill to summarize the January 12 preparatory call on uncertainty.

2 km radius. Brown had asked ORD's Schwede's to explain the plots in illustrating deposition within the 2 km radius, which she did. He then asked about risk.

His understanding is that EPA believes that because the highest concentrations are closest to the site, the highest risks are there as well. This does not account for secondary sources. It is clear 3MRA is not intended as a long range risk assessment tool. Maddalena had a slightly different twist, because he was more interested in whether 3MRA could be used on its own to decide which chemicals could exit the waste stream. He thought 3MRA was not structured to detect chemicals that would concentrate a long way off-site (like PCBs in the Great Lakes) the call confirmed the model was not structured to look at the physical chemical properties which control the long range transport of chemicals. The conclusion was that 3MRA should not be used on its own; some additional analysis should address potential for long range transport. DePinto noted this issue was raised in the context of Question 3b. Maddalena's notion that 3MRA cannot be used alone to determine long range transport of chemicals will be incorporated in the response to 3B. The example of mercury at the chlor-alkali site may be an illustration of this difficulty because 3MRA does not account for long-range transport into the site which is being evaluated. That is, most of the mercury comes from someplace other than the site.

Uncertainty Analysis. Merrill noted that, after Babendreier provided the results of the seven chemical study (discussed on the December 15 teleconference), Carlisle and Merrill had a few additional questions which they raised on the January 12 fact-finding call. For example, what, if any was the connection between the number of waste management units (WMUs) in the sample and percent sites protected. EPA provided additional materials in response to the questions. Merrill felt the call clarified things for him and he has updated his comments for the response to Question2c. He thinks this is a statistically nuanced issue that does not require more discussion, but would be happy to answer questions. In addition, they briefly discussed, the large jumps in the output due to the large range between each Cw that is modeled; there can be two orders of magnitude between the five individual parameters that are modeled. This is also reflected in Q2c.

Merrill had a question on %G that EPA clarified; any remaining issues in his mind are esoteric and do not bear on the overall approach.

The third issue was the suggestion that results be rolled up on a site basis rather than the current approach. They discussed associated data storage issues. Carlisle said that a corollary of wrapping the results up by site was saving percent population protected as a value as opposed to bin. His conclusion is that it is possible to retain that data (as a disaggregated analysis) at a considerable cost in terms of data storage, but costs that can be born. This was asked if this was an appendix issue or a recommendation. Merrill thinks the approach has merit; EPA has indicated an interest in using 3MRA on its own where this would be especially helpful. It would also be useful in identifying the sites which have the highest risk. Carlisle added that some members of the public, and some members of the panel, have looked at 95% of the population at 95% of the sites 95% of the time actually yielded a protection level in the 80s. He doesn't think this is right, but it is difficult to demonstrate with the rolled up value. deFur thanked Carlisle for raising this concern of his.

Question #2. The response to this question was discussed at length on the December 15 teleconference. Murarka is working on revising the response to charge question 2 and Carlisle offered to send him some additional material.

Question #3. Discussion of this question began, but was not completed, on the December 15 teleconference. DePinto reminded Boissevain that she was going to elaborate on how 3MRA does data aggregation and what impacts the Panel thinks it might have for question 3a.

With regard to question 3b, the initial discussion recognizes the difficulties of a standard validation of a model of this nature. The current draft states the Panel agrees with EPA's use of the Beck approach which involves other measures of model validation beyond comparison with data for a site-specific application. The best we can do here is gain sufficient confidence to use the model as it was intended to be used based on these other analyses and evaluations. He asked if the Panel had any concerns about this.

Thibodeaux commented that, particularly on the evaluation that EPA does on WMUs and source generation, there is some comparison of modeling data, which he thinks is appropriate. But there doesn't seem to be any sort of criteria or standard. It seems any degree of matching is deemed acceptable. It bothers him that each one seems like a moving target and, even if it is a couple of orders of magnitude off. DePinto asked if Thibodeaux would like to see more *a priori* objective criteria and Thibodeaux said he would. DePinto thought he had addressed this in a previous draft based on comments from Brown. Travis thinks that the question of how well a certain parameter has to be predicted is sensitivity analysis dependent. Maddalena said the context was on module output, not parameters within modules; he agrees that some criteria would be valuable, even though it might have to be variable. Thibodeaux agreed that Travis has a point which should be incorporated. If something is off by two orders of magnitude and has little impact on the results, so what? 3MRA will give uncertainties about its calculations; sites will have sampling errors. He's not sure how this would be done. Thibodeaux thinks this can be done at individual WMUs.

DePinto thinks a related point is that for the sources (WMUs) you could find significant data in order to make that assessment on a quantitative basis. Brown doesn't think EPA should go out and get more data. The question was directed at those modules that could be validated with the data in hand. The criticism was that the evaluation EPA did was qualitative. He would like it to be quantitative.

Smith thinks even if *a priori* criteria were not evaluated, an *ex post facto* approach using what's on page 26 could be done. He recently read a four model comparison study. The ISC model in a field test with sulfur hexafluoride, 80% of the results were within a factor of 5 for the 76 sensors, about 50% were within a factor of 2 or 3. Of the four models evaluated, ISC was always the most conservative. The other models were more precise, when judged by the whole set of model performance

criteria, but ISC was the only one which was always conservative. For applications that you want to be sure are conservative, than ISC has an edge. This example could be cited because ISC has been cited so often. The approach used in this study might also be useful to EPA if they wished to. Because the data exist, we could add to the report how ISC and EXAM are expected to perform – within uncertainties of 2 and 5, not orders of magnitude. Thibodeaux thinks this is helpful. After the call, Smith provided additional information and references, now found in Attachment 7.

Theis asked if this was a recommendation to define quantitative criteria and use them. Thibodeaux doesn't know, he just gets an awkward feeling when he reads it. Theis proposed, if each module met the criteria of matching well with existing data, then – when we put them all together, the match is not as good, what would we conclude from that? Thibodeaux went back to the chlor-alkali example where they are confident it was the source term, not the model. Smith said this is a measure of the confidence the panelists had built in the model. Theis said EPA is trying to solve the national problem. Thibodeaux says, if you don't have the parts right, it is hard to get that warm fuzzy feeling that you have the combined analysis right.

Theis sees this as falling within the overall data procedure where data matching is one element within several. In that context, 3MRA is pretty much in agreement with the requirements of the Beck paper. The Panel has already suggested EPA take data matching exercises seriously and use quantitative measures of success. He wants to know whether this is a pre-condition because it would take years to complete those exercises. He noted that EPA is also on record saying that, whatever exit levels 3MRA calculates, the calculation alone will not be used to set the exit levels. Brown doesn't think it should be a criterion; Doug has given some good criteria for ISC. When you do the sensitivity analysis for the full model and it comes out that one parameter is very sensitive, you will go back to the relevant module and look closely at it. That's where this kind of analysis is most useful.

Theis asked DePinto if he felt comfortable elaborating on this a bit in the next draft, perhaps where text is now on page 3. Thibodeaux will provide DePinto with some additional comments; DePinto was thinking of putting this in the appendix. Thibodeaux agrees this type of model comparison is time consuming and the Panel should not push the EPA to that limit. Murarka's revised response to question #2 contains some material which may end up in DePinto's revised response to question 3.

DePinto moved the discussion to sensitivity analysis. The draft currently recommends EPA use sensitivity analysis to identify the most important parameters, sites, etc. and conduct a quantitative uncertainty analysis. He wants to be sure this is still the Panel's recommendation.

On the 2 km issue Theis thinks that the Panel will say that the architects chose 2km and the consequences are that it is not suitable for long range transport. Smith noted even 5 km is not considered even intermediate range (typically 10-20) km. Because of his work experience, he is nervous about not addressing what happens

between 2 km and 10 km, and asked, "Is the statement EPA trying to make is that individual risk is limited within 2 km?" Maddalena thinks EPA goes beyond that to say that there is a population related risk. While population increases at greater distances, exposure decreases. Smith has some experiences in California with towns in the 5 to 8 km range which showed there were many sites with ground level sources where the risk did not drop off as quickly as 2 km. This is the underlying root of his concern. If the statement is qualified to say the goal is to protect 95% of the individuals to have a risk less than such-and-such, but population risk is a different issue. When it comes to ecological effects, you have to think of the receptors because you may be interested in a receptor that does not occur within 2 km, but does occur beyond it. The "isolated pond case" is an example of this. One solution is to state these as limitations. Theis said this might go in the response to Question 4 which relates to documentation.

Boissevain asked how this information helps the decision-maker. Carlisle thought about this in the context of Maddalena's long range transport issue. Although risk to the individual generally decreases monotonically, there is a general problem of long range transport adding risks to regional risks. Perhaps a sentence or two explicitly asking that these issues be taken into account would be good. While the Panel does not wish to beat the Agency over the head for this, disclosure is important and so is the use of tools that compensate for these limitations. Smith noted that the structure of 3MRA is not limited to 2km and that decision is somewhat artificial. Another panelist thought that 20-50 km were possible based on the modules used. Maddalena thought the smaller radius might have been selected to avoid the difficulty of analyzing overlapping sites. Theis noted that not all the modules were robust to longer distances, GSCM, for example, is not. Also, because 3MRA doesn't look at the physical chemical properties relating to long term transport, it would run into trouble before 50 km.

Theis noted 3MRA was designed to be queried. In the end, the results of 3MRA go into a pot with other stuff and decisions get made. Laniak noted that another big factor for EPA was the cost of data collection. EPA wanted to treat the sites in a uniform fashion and could not do a full blown assessment for each site; the data they did collect cost about \$1.5 million. If they go to 4 kilometers, the expense of measurement goes up by a factor of four. The question becomes what distance can EPA handle financially while being sure that they are capturing the bulk of the risk. He agrees with Smith that the model is not limited to 2 km, it is a data collection limit. He would like to know if the Panel thinks they have balanced all these considerations in an appropriate fashion. Theis turned to the phrasing of question 3B which includes "real world limitations"

Smith responded to Laniak saying what had troubled people was not the collection of a full set of additional data, but a few fairly small issues, such as the isolated lakes and populations which could be picked off of web-based data sets. Then some effort could be made to see if inclusion of these would change the results much. He referenced the RMP rule relating to acute spills of chemicals. The EPA RMP Rule is the Risk Management Plan Rule, also known as Clean Air Act Section 112 (r), or 40 CFR 68. This requires identification of a radius that extends to the limit of the

concentration of concern, often ten miles from their facility. This did not seem to be a huge effort to consider for two contaminants. DePinto spoke to some modeling efforts around the Great Lakes where the contributions of a single site to a lake were assessed. Locations all over the US and Canada make significant contributions to the exposure, through bioaccumulation, of mercury in the lake. If you compute an acceptable risk for one of these kinds of chemicals based on the 3MRA analysis, it does not preclude you from having an unacceptable risk in a major receptor area, like the Great Lakes. To him, it doesn't make sense to allow sites to discharge mercury or dioxin. Laniak thinks that-- if long range transport is important --it is an important point to bring out in the report. Smith suggested that they recommend EPA identify those chemicals for which long term transport is a concern and use those tools in conjunction with 3MRA where appropriate. There seemed to be general agreement on this approach. Carbone didn't think 3MRA should be used or altered for use with long-range transport. This reminded everyone of 3MRAs history as part of RCRA.

Maddalena says the concern about the Great Lakes is very different than Smith's concern that potential risk is just beyond the 2 km border. He is comfortable that EPA has a distribution across the nation that is just as likely to have a couple of lakes within 2 km as to miss them. Smith reflected that one piece of the analysis would be to check those assumptions about the isolated ponds and population centers. As long as such cases weren't the very same ones that failed when the sites were analyzed, that would be comforting.

Babendreier said they work on a population density basis. They do not count a site as protected if there were no receptors within the 2 km radius. Smith said that wasn't clear to him. Babendreier said they don't want to give a site a free ride just because it doesn't have receptors within 2 km. Maddalena said that is a very important point that he had not picked up on in his reading and asked if there was a specific number of humans needed within 2 km; Babendreier said the smallest site they have has ten people (see Volume 2 discussion of human receptor data). In effect this disqualifies some sites from the analysis. This moved into a discussion of uncertainty with Carlisle making some suggestions for a simplified analysis that assumes that the analyst knows what a reasonable range of values was to begin with. He wonders how EPA will get the values for the analysis given the non-stochastic nature of the effects analysis.

DePinto was concerned with the Panel's agreement or disagreement with the last sentence of the first paragraph on page 7. "The panel recommends that the Agency use the sensitivity analysis results to identify a limited set of chemicals, WMYU's and pathways that are the most significant and conduct a quantitative uncertainty analysis on ISE." This said it is the Panel's job to answer the question. The question is how much validation is required. He thinks the statement as is does not answer the question. His understanding is that the Panel agrees with the validation procedure and agrees that the Agency has followed it well. The issue that arise concern data validation within that process; the question is how much more data validation do we want to see before the model can be used? Carbone thinks the Panel agrees 3MRA as

a system is not validatable in the historic sense. The Panel agrees the Beck system is a good way to go and then build a weight of evidence approach, such as the TRIM FATE comparison, suggesting 3MRA is at least reasonably accurate. Maddalena agrees with the statement but thinks it lacks specificity. Theis thinks the Panel wants to see sensitivity analysis go forward as part of the application of 3MRA. Speaking for himself, he is uncomfortable with the data matching business because he doesn't think it is doable in any conventional way. As a result he is not comfortable saying EPA should match a bunch more data before they use 3MRA because that is tantamount to saying it should not be used.

Brown raised use of more of the qualitative approaches, like running chemicals through the model whose behavior we know very well just to be sure that the results make sense. DePinto thinks it is in the draft and has been struggling to find the language to express it. Theis and Murarka thinks the model can be used and these analyses done. DePinto thinks the question is more specific. There may be other things relating to the use of the model in addition to the validation question. If the Panel is comfortable, he would be happy to say the model has undergone enough validation to be used and that continued work should be done. Carbone says the efforts EPA has made in regard to validation are laudable and we would recommend use however the Panel strongly urges EPA to make every effort to provide information to increase the confidence of the public and the Agency itself through continued validation effort. In reality, if people aren't confident with a model, it just stays in a box. Brown says it needs a plan for ongoing continuous improvement. Maddalena thinks the plan should be developed before exit levels are established. Carbone thinks that to look at 900 model inputs, distributions, sensitivity, MCA is a huge job.

At 3:15 Theis summarized that the Panel endorses EPA's plan to do a sensitivity analysis before deploying 3MRA and strongly urges EPA to continue its analysis.

There was a 15 minute break. After which the chair moved the discussion to questions 4 and 1. He raised two issues regarding question 4. Is there any material that could reasonably be put in an appendix? On page 6-7 there are some statements about variability and uncertainty. How much should go in Q4 instead of Q2? Merrill responded that question 4 is a little different than the other questions in that there are a fair number of detailed recommendations which could go into an appendix to improve readability of the ultimate report.

Merrill quickly summarized the six general comments. First, to develop a more digestible summary for a diverse readership; second that the discussion of uncertainty and sensitivity in Volume 4 needs to be more concise and 3MRA related instead of a textbook discussion; third, a summary of key operational parameters that are not – to the naked eye – based on underlying principles; fourth, EPA should articulate a plan to continually update exit levels as modules and toxicity factors, etc. are updated; fifth, allowing people to take a look under the hood; and sixth, clarifying what EPA means by using 3MRA as a screening model.

Thisis asked how the Panel felt about the screening issue, which might await a discussion of the Boissevain/Smith tables. Boissevain feels that it was enough of an issue that the Panel looked at it in greater depth and it relates to the validation effort where the chain is only as strong as the weakest link. Travis doesn't care what EPA calls it and thinks the Panel is doing a lot more than it needs to. Like Eschenroeder, he thinks the Panel should just recommend removing the word "screening". Eschenroeder noted that the meaning of "screening" to air modelers and risk assessors. Thisis said it can be seen as a hierarchy of model complexity but EPA man mean screening hazardous waste sites. There was a discussion of the very usage and the adjective usage and some thought given to elaborating in the report the different meanings. Merrill hears the consensus that "screening" is not adequately defined so it should either be dropped or defined and used solely as an action, not as an adjective, analogous to soil screening levels.

Thisis asked the Panel about the other recommendations and heard "good". He directed the panelists to Candidate Outline for Improved "3MRA User's Manual" on page 10. He thought that, when this was discussed there were two points of view. One is that this is the Agency's mandate and this documentation was put together to explain it to the SAB. The other is that all sorts of people will use the model and the documentation should meet there needs. He sees page 10 as leaning towards the latter. Smith said the language was intended as a suggestion which would facilitate usage by others.

Thisis asked if there were any other comments. Merrill mentioned the important point Babendreier raised earlier on this call (that sites without populations within 2 km did not get a "free ride") and thought that should be brought out more clearly. It is a subtle, but key point. The notion of population protection is so fundamental to 3MRA, perhaps it warrants being a specific comment. Merrill thought he had enough to make a more parsimonious draft of Question 3 with a more elaborate Appendix.

At 4:00 Thisis began a discussion of the response to Question 1 which includes a re-iteration of what the assessment methodology is and a discussion of the actual development of the modeling system .

Eschenroeder suggested removing ozone from the discussion of ISC on page 2. On page 4, about line 20 the "solution" he would substitute "their" for "the" to emphasize why there are quotes around "solution". Around line 37 "the Panel's responses to". Immediately after that there is paragraph on policy issues having to do with risk management. He sees 3MRA as a tool developed to assess risk, not to decide acceptability. Therefore, that paragraph can be deleted. Thisis noted Carlisle had raised a similar issue. Carlisle observed that he sometimes feels compelled to push into policy; but he does think the discussion should be kept separate. Merrill is not uncomfortable with the acknowledgment of assimilative capacity but is troubled by the nearby sentence with "encourages".

Merrill will draft a paragraph on percent site protection. Theis will also draft a paragraph.

Merrill brought up a suggestion of Maddalena's and also a non-committal comment in 3B about peer review. He asked whether the Panel is going to make a more elaborate statement about prior peer review. Carbone thought EPA had satisfied the Panel by saying they had implemented the ones they could afford to. Brown recalled that some of the peer comments contradicted each other. DePinto thinks this is stated in 3B. Boissevain thought that the Panel had been very concerned about this. Several panelists noted how much work it would be to pick out the key recommendations. Maddalena said that if peer review is to be used in the Beck et al model validation context, it needs to be implemented. Travis thinks 3MRA has been reviewed to death. EPA has done what every one does with peer review – they took some advice, didn't take other advice, and said what they did. We think the model is OK as it is and this Panel should not focus on whether EPA answered every peer review question. A panelist observed that's sort of what EPA did with the GCSM. Maddalena said he doesn't fault EPA for what it did, but thinks it is possible to improve how the table represents it. As long as there are items in the last column, further improvement is possible. The peer reviews are a wonderful resource, but not a check mark that says, "we did the peer review now move on". Therefore, it should be in the model development chapter, not model validation. Travis thinks it is part of model validation and they don't have to respond to every comment. People always want you to add more bells and whistles and you can't.

At 4:30 Theis felt he had enough input to revise the response to Question 1.

Carlisle asked if there was still the possibility of an "other comments" section. Theis said he isn't sure how to organize it, but don't hold back. He will find a way to include Carlisle's other comments.

Theis then turned to the discussion of the Additional summary points to see which should be included and where.

At 4:35 there was a brief discussion of the work of Boissevain and Smith. Theis suggested adding a sentence to Q1 to the effect that the Panel has provided individual rankings of the submodels which are found in Appendix XYZ to round out how we singled out ISC and GSCM and make it sure that this is not a consensus. Another approach would be an appendix mentioned in another section. He noted the Panel just had a discussion on the use of the word screening and he thinks the meaning of the word here is different yet again – degree of complexity.

Theis asked if there were any other comments. There weren't.

At 4:50 Nadine Weinberg of ARCADIS made comments on behalf of the HWIR Consortium who had sent written comments before this meeting. She wanted reiterate some of the comments. One of their critical issues is the question of when the model be

used. They would like to see that the peer review comments be addressed because they don't think the Beck guidance will be followed if they aren't. No one had any questions for her. This assured her that the Panel will take the comments into consideration.

At 4:55 This observed that they had completed their agenda in the allotted time. The revisions are due February 2. February 6 is the last opportunity for significant readjustments because the February 27 call should wrap everything up.

Eschenroeder made a public service announcement about a show on air quality modeling on Court TV Monday at 8:30 Extreme Evidence

Dr. This adjourned the meeting at 5 p.m.

Respectfully Submitted:

Certified as True:

/s/
Ms. Kathleen White
Designated Federal Official
Environmental Engineering Committee

/s/
Dr. Thomas This, Chair
3MRA Panel

Attachments (hardcopy)

1. Agenda for the meeting
2. List of attendees
3. Committee roster
4. Federal Register Notice
5. DFO's notes from the January 9 Fact-Finding Call on the 2 km radius
6. DFO's notes from the January 12 Fact-Finding Call on uncertainty
7. Additional information from Smith