

**Department of Health and Human Services  
Centers for Disease Control and Prevention  
Agency for Toxic Substances and Disease Registry**



**April 13, 2004  
Oak Ridge Reservation Health Effects Subcommittee Meeting  
Summary Report**

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**Department of Health and Human Services (DHHS)  
Centers for Disease Control and Prevention (CDC)  
Agency for Toxic Substances and Disease Registry (ATSDR)**

**Oak Ridge Reservation Health Effects Subcommittee Teleconference  
Summary Report: April 13, 2004**

The twentieth meeting of the Oak Ridge Reservation Health Effects Subcommittee (ORRHES) was convened on Tuesday, April 13, 2004, at the Kingston Community Center, Kingston, Tennessee, from 12:15 p.m. to 6:15 p.m.

Present were: ORRHES Members: Peggy Adkins, W. Donald Box, Robert Craig, Kowetha Davidson (Chair), Karen Galloway, George Gartseff, Jeffery P. Hill, Sandy Isaac, David H. Johnson, Susan Kaplan, James F. Lewis, Anthony Malinauskas, LC Manley, Peter Malmquist, Donna Mosby, Barbara Sonnenburg, William Taylor. ORRHES Liaison Representatives: Chudi Nwangwa (TDEC), Jon Richards (EPA), Brenda Vowell (TDH). ATSDR Representatives: Loretta Bush, Paul Charp, Jack Hanley, Marilyn Horton (DFO), Jerry Pereira, Peg Roberson, Susan Robinson, Terrie Sterling. Guests: Gordon Blaylock, Timothy Joseph, Janet Michelle, Phillip Morrison, and Teresa Robinson (Cambridge Communications).

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**Call to Order/Opening Remarks/Introductions  
Agenda Review, Correspondence, and Announcements  
Approval of February and March Meeting Minutes**

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*Kowetha Davidson, Chair*

*Oak Ridge Reservation Health Effects Subcommittee (ORRHES)*

Dr. Kowetha Davidson welcomed everyone to the meeting and asked Dr. Peter Malmquist if he would like to welcome the group to Kingston. Following Dr. Malmquist's gracious welcome, Dr. Davidson asked everyone in the room to introduce themselves.

Following the introductions, Dr. Davidson briefly reviewed the agenda for the day and then called for approval of the February and March meeting minutes. She indicated that several comments had been submitted with regard to the February meeting and that those comments would be incorporated into the minutes.

**Motion**

Mr. Robert Craig moved to approve the February meeting minutes with the submitted changes. Mr. Jeffrey Hill seconded the motion. The motion carried unanimously.

**Motion**

Dr. Tony Malinauskas moved to approve the March teleconference minutes. Dr. Robert Craig seconded the motion. The motion carried unanimously.

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**Status of Action Items**

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***Marilyn Horton, DFO  
Oak Ridge Reservation Health Effects Subcommittee (ORRHES)***

Ms. Marilyn Horton directed the group's attention to the Action Items Handout in their packets, explaining that the Action Items List now include the following February 3, 2004 and March 9, 2004 action items. She reviewed the status of the pending action items as follows:

- Tim Joseph will provide ORRHES a copy of the status of the new well installation project. That information was mailed out after the February meeting.
- Paul Charp will provide information on the fiscal/biological/effective half-lives of the radionuclides, which he presented at a past meeting. That information was included in the handouts for the 4/13/04 meeting.
- Jerry Pereira will report on specific budget changes to the ORRHES chairperson and chairs of the work groups, if it critically impacts the subcommittee. If there are no major impacts, he will present an update at the next meeting. Mr. Pereira will present an update on the budget issues.
- NAWG will present more information on the proposed plan for collecting information about the ORR Community Adjusted Timeline. That presentation was made.

Ms. Horton then introduced Ms. Loretta Bush, because one of the recommendations that was made at the February 3, 2004 meeting was on the final PHA on the Y-12 Uranium Release. She indicated that most of the people in the room knew Ms. Bush, who acted as the DFO for the ORRHES when it first began several years ago. She is also a Lead Senior Community Involvement Specialist with the ATSDR. Ms. Bush explained how the Y-12 document was released.

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**Y-12 Document Release**

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***Ms. Loretta Bush  
Lead Senior Community Involvement Specialist  
Agency for Toxic Substances and Disease Registry (ATSDR)***

Ms. Bush indicated that the Y-12 documents were sent distributed to the community on March 19, 2004. These documents were followed up by a media press kit, which was disseminated to identified media outlets on March 24, 2004. The press release was distributed to over seventy

media outlets in the area; however, the four main media outlets identified were the *Oak Ridger*, the *Roane County News*, the *Crossville Chronicle*, and the *Knoxville News Sentinel*. The press kits they received included: the PHA document, the CD-ROM, a fact sheet on ATSDR, and the summary and briefing documents on the Y-12.

**Discussion Points:**

- ◆ Dr. Tony Malinauskas commended the ATSDR staff who worked on the document. He was particularly impressed with the two abbreviated versions that he had been requesting for many months. He thought that the job was well done. Dr. Davidson thanked Dr. Malinauskas for his kind comments.
- ◆ Mr. James Lewis stated that in the body of the minutes of the last subcommittee meeting, the subcommittee had agreed upon a release plan. He suggested that someone locate that recommendation and read it, because he was concerned that the recommendation had asked that the Y-12 document have a “fanfare” release, and that there would be a public meeting or announcement regarding the release of that document. That was done as a compromise to the discussions that the subcommittee has had concerning the document. From Ms. Bush’s comments, it seemed that had not been done. Although he agreed with Dr. Malinauskas that the documents were beautiful, he wondered what had happened to the recommendation that the subcommittee approved and forwarded to the ATSDR. He asked ATSDR to respond to this matter, to explain what the process was with regard to the release of the document, and where the breakdown occurred. He said that to the best of his knowledge, and in discussion with the press, they did not obtain the types of items that Mr. Lewis was looking for related to the release effort.
- ◆ Upon checking her documentation, Ms. Horton read the recommendation for the record:

“The final PHA on Y-12 Uranium Releases will be publicly released in the ORR area, in the presence of both the public and the media, along with an official explanation regarding the differences between the ATSDR and the EPA methodology in determining risk versus dose, both of which reached the same conclusions.”
- ◆ Ms. Bush pointed out that Mr. Lewis was referring to the three release documents, which were in their handouts. These documents were entitled, “ATSDR’s Cancer Comparison Value,” “Uncertainty Analysis,” and “Screening and Regulatory Dose Limits.” She stated that after conversing with Mr. Lewis about this particular issue, she investigated the issue and found that the recommendation was actually made on March 3, 2004, at the last ORRHES meeting. She became re-involved with the ORRHES on March 9, 2004, after that ORRHES meeting. However, it was brought to her attention that the recommendation was for these particular documents, and these issues with which the ATSDR had disagreements with the EPA, and that the subcommittee wanted the ATSDR to mail information to media outlets on these particular items of concern. However, Ms. Bush explained that in accordance with ATSDR policies and procedures, even though the documents had been developed, in order for staff to release the information to the media, to the community, or even to any member of

the ORRHES, final approval had to be received from management staff. At the time of the documents' release, the clearance process had not been completed.

- ◆ Regarding the three handouts, Mr. Jon Richards asked if it was appropriate to correct items on the three ATSDR documents now or if there would be an opportunity later in the meeting. He was concerned about the term "EPA clean-up level."
- ◆ Mr. Lewis apologized for interrupting, and he appreciated Ms. Bush's comments, but he wondered why the ATSDR did not implement the subcommittee's recommendation. This recommendation, which was a compromise between the subcommittee and ATSDR, was recommended by Dr. Herman Cember, and the recommendation was that the PHA on Y-12 Uranium Releases document would be released simultaneously with a public presentation of the information. Mr. Lewis said that Dr. Davidson indicated to him that the subcommittee would receive a written response from the ATSDR regarding why they did not comply with this recommendation. He thought that the recommendation was quite sound. Dr. Davidson clarified that she had stated that the ATSDR is not required to carry out the subcommittee's recommendations, but they are required to respond to them.
- ◆ Mr. Lewis asked the ATSDR to respond to the recommendation. Dr. Davidson asked for clarification on what he was trying to ask: Was he asking for a response regarding the recommendation or was he asking why the information was not released? Did he want an additional explanation beyond that which Mr. Bush had given?
- ◆ Mr. Lewis reminded the group that at the last meeting they had discussed the fact that they had not heard the EPA's position on the PHA on Y-12 Uranium Releases. In conjunction with the release of the PHA on Y-12 Uranium Releases, the subcommittee thought that they would have a public meeting where the subject might be discussed openly with the public. That meeting never happened, and Mr. Lewis wondered why.
- ◆ Mr. Jerry Pereira explained that there were several reasons that the fanfare meeting did not happen. First, the three documents that the committee received were not ready. Second, he did not have a problem with conducting a public meeting in Oak Ridge, even though the PHA has already been distributed, however, he was not sure whether such a meeting would have any impact on the citizens of Oak Ridge. Still, if it was of concern to the subcommittee, the meeting could be scheduled. He reiterated that a press release was distributed, the handouts that Ms. Bush had provided would follow that press release, and he suggested that if there were any other issues for the citizens of Oak Ridge regarding Y-12 Uranium, ATSDR would address those. If it needed to be in a public forum, it would be done. If it needed to be on a one-on-one basis, it would be done that way.
- ◆ Regarding the three handouts that the subcommittee had been given regarding the Y-12 Uranium Releases, Mr. Richards commented that the EPA does not have a "clean-up level" for radiation or chemicals. For radiation and chemicals, it is the same. The risk range is the clean-up. The EPA does have what is called the "upper end" of their risk range that translates to 15 millirem, which is an easy solution. They could say that that number was the "upper end." In other words, the risk range is  $10^{-6}$ ,  $10^{-4}$ . The EPA now declares  $3 \times 10^{-4}$  as

its “upper end,” which is approximately 15 millirem per year, for a 30-year lifetime. That is the Superfund default, and it is in the Office of Solid Waste and Emergency Response (OSWER) guidance, which was released in 1997 and which clarified that risk range for all the Superfund clean-ups. He expressed his apologies if this draft had already been printed out, but ATSDR needed to correct the terminology on their handouts. He added that the term appeared on every sheet, clarifying that ATSDR could replace the phrase, everywhere it appeared, with the phrase “upper end of risk range,” which would be appropriate.

- ◆ Ms. Susan Kaplan stated that Mr. Richard’s comments made it apparent that it is important to have the EPA’s input in this process. She also thought that Mr. Lewis’ frustration with how the subcommittee’s recommendation was handled was apparent to everyone. She pointed out that Mr. Lewis had put in a great deal of effort into bringing the EPA into this process and to have an open discussion with the EPA. His hope was that there would be a public meeting at which to launch the PHA, or that a public meeting would be held preferably before this report, at which everyone might discuss outstanding issues. She said that evidently, she was the only subcommittee member who had received a hard copy of the PHA, other than the CD-ROM, which is nice to have. She also complimented the ATSDR on the report, because it has the potential of being the best, most readable public document she had ever seen. She briefly scanned the document earlier in the day, and found it to be a very well done document in terms of being easy to follow and read. Unfortunately, the PHA document was not a draft document that would be revised, but Ms. Kaplan thought with one more revision, it would be a great document.

Ms. Kaplan then indicated that she had something that she would like to read into the record, and some material that she wanted to submit for the subcommittee’s consideration, because having the EPA’s input is still very important. Following is a letter that Ms. Kaplan wrote to the subcommittee on April 13, 2004. The subject was the outstanding EPA issues on the Y-12 Uranium PHA.

“As a result of James Lewis’ efforts to supply EPA with key sections of the meeting minutes on this issue, EPA Headquarters and Region IV agreed to participate in a public meeting on Monday, April 13 in Oak Ridge to provide the affected community the opportunity to have an open discussion on the outstanding issues on the Y-12 uranium PHA. They were also on the agenda to speak to ORRHES at today’s meeting in Kingston.

The primary purpose of the proposed Monday night public meeting was to compensate for ATSDR’s failure to fully implement the motion that was passed by ORRHES on Feb. 3, 2004, i.e., that ‘the Final Y-12 Uranium Releases PHA be publicly releases in the ORR area, in the presence of both the public and the media, along with an official explanation regarding the differences between the ATSDR and the EPA methodologies, in determining risk versus dose, both of which reached the same conclusion.’ The final report that was released was dated January 30, 2004 and a press release was issued March 24, 2004. No public meeting was held and today’s ORRHES meeting is being held outside of Oak Ridge.

Because of ATSDR's unwillingness to aggressively pursue the issue of EPA's attendance, James Lewis decided to take on this effort himself. I would like to commend James for his efforts to convince EPA to have an open, public discussion. However, despite his successful efforts, ATSDR's actions resulted in the cancellation of that meeting last night and the talk today. Because of ATSDR's unwillingness to participate in these meetings, the desired goal, which was to have all parties at the table, would not have been achieved. So, James decided to agree with ATSDR on the premise that the discussions would be held in an open and timely manner.

In anticipation of these meetings, I compiled a timeline of the EPA controversy. Having ready access to the detailed meeting minutes allowed me to perform this analysis, which helps us understand complicated things like this. Please note that what was accomplished by James and me was made possible by the ready availability of detailed meeting minutes—another controversial issue that some members of ORRHES have fought hard for and which ATSDR has been reluctant to provide. See the Motion made by Karen Galloway in the February ORRHES meeting minutes, which was defeated. This was one of several such proposals over the course of ORRHES' existence. It is critical to recognize that having the tools that enable a member of the public or a Subcommittee member such as myself to do such an analysis is the only means that taxpayers have of holding our government accountable. So, although EPA did not come to Oak Ridge this week, I would still like to submit this draft document for the record. [See: EPA Controversy Timeline]

What do we want? I suggest the following as a start:

- Regarding the June ORRHES meeting that EPA may be attending, in addition to the regular ORRHES meeting on Tuesday, ORRHES also should be convened on Monday evening in Oak Ridge to provide the Subcommittee, as well as the Oak Ridge community, the opportunity to hear from EPA without the time restrictions of a normal Subcommittee meeting.
- The EPA controversy over the Y-12 uranium releases illustrates systemic problems that exist within ATSDR and how it interacts with the Subcommittee, attempts to control it, and how it responds to Subcommittee recommendations. Unfortunately, it appears the organization's public-participation process has broken down, something that threatens to undermine the public's trust in all the organization's efforts in Oak Ridge—and not for just the Y-12 uranium releases. A work group should be established to analyze this subject.

Letter signature: Susan Kaplan.”

- ◆ Ms. Horton thanked Ms. Kaplan for her comments, asked her to provide the writer/editor with a copy, and indicated that she would make sure that everyone received a copy of the letter and the timeline.



- ◆ Mr. Jack Hanley pointed out that the EPA does attend the subcommittee meetings, through the form of their liaison representative, Mr. John Richards, from Region IV. After the December meeting, Mr. Richards recommended that ATSDR contact the Office of Radiation and Indoor Air (ORIA) directly. The ATSDR contacted ORIA directly and had a conference call to discuss the issues. They were invited to attend the meeting. They were also offered the opportunity to have a conference call with Dr. Davidson and Dr. Cember on these issues. They decided, instead, to write a return letter to Dr. Davidson. The ATSDR did make efforts and continues to make efforts to contact the EPA. The EPA does plan to attend the June ORRHES meeting.
- ◆ Ms. Barbara Sonnenburg emphasized that the group needed to have the discussion now, while Ms. Kaplan was in attendance. Ms. Kaplan is quite ill and was going to have to leave, and so the subcommittee did not need to wait until the end of the meeting to discuss these issues.
- ◆ Mr. Davidson pointed out that the EPA would be attending the June meeting to address these issues.
- ◆ Ms. Sonnenburg re-emphasized the need to have a discussion now, for Ms. Kaplan's benefit. She added that she found it amazing that the Y-12 PHA handouts, which were public documents, quoted the EPA and the EPA was never asked to look at them and verify them before they were printed with the wrong information on them. If somebody was going to print her name and say that she said "so and so," they had better check with her to ensure that the facts were accurate. Evidently, no one checked with the EPA to ensure that the facts included on the Y-12 handouts, which were public documents, were accurate. While she did not know who prepared these documents, she thought that they should be destroyed and ones that EPA approves in writing should take their place. Second, she asked for a copy of the letter that the EPA sent to Dr. Davidson, because she had not seen a copy.
- ◆ Dr. Davidson stated that the letter had been distributed at the February meeting, and that all of the subcommittee members received that letter at that meeting.
- ◆ Ms. Sonnenburg asked her to send her a copy of the letter. Ms. Sonnenburg also wanted to know how they might put the contents of Ms. Kaplan's letter into a motion. She thought that the subcommittee needed to move certain things on which they could vote on in the next few minutes. She thought that they needed to condense the letter's contents and vote on the issue. She simply did not want to wait until the end of the meeting, when Ms. Kaplan would not be in attendance.
- ◆ Mr. Lewis stressed that this has been quite a frustrating experience for him. He added that Ms. Kaplan had done a great deal of work on her timeline document, and he suggested that everyone take a moment to look at it, because it was a reflection of the subcommittee's detailed discussions regarding process issues. It also addressed the subcommittee's efforts to bring the EPA to the table, an agency that has a different perspective or point-of-view than ATSDR. The reason that the ORRHES wanted the EPA involved was so that they could share their perspectives with regard to the issue of concern with the public, so that the public

was not hearing only someone else's interpretation of that perspective. He thought that the subcommittee should review the document and take a look at the number of times that things have been said about the issue and at the subcommittee's inability to get the EPA to the table. He did not want anybody to take the blame, because there might be reprisals, but he felt that there were some people here who should do their jobs.

As a citizen, he personally contacted EPA because all he had heard about the attempts to contact the EPA had been secondhand. He had read the letter and heard from ATSDR about their discussions with the EPA. He had personally contacted Headquarters and Region IV, and it was amazing what he found out. After a brief discussion, he told them that as a citizen he could not personally ask them to come, but he offered to share with them the minutes of the last meeting. He mailed the minutes to the appropriate people at the EPA, asked them to review those minutes, and asked them if they would come to Oak Ridge to present their viewpoints. The people at the headquarters said that it was not timely when they had received Dr. Davidson's original letter, so therefore they could not have coordinated their activities to attend the meeting. EPA directed him to contact Region IV. Region IV indicated that issues of this nature should not be handled on lower levels, that this type of conflict should be handled by the appropriate levels of management who would determine if they could work it out.

Approximately two weeks ago, in talking with an individual on the subcommittee, Mr. Lewis was made aware of the fact that the EPA was going to be put on today's agenda. When he found out that they were going to be put on the agenda, and the time and the location of the meeting, that increased his frustration because the affected community was not even aware of what was happening. Therefore, he personally contacted the EPA to alert them of the fact that it was fine for them to come, but if they were going to take advantage of the travel time, he suggested that they consider meeting with the general public on Monday evening and present their perspective. In his opinion, that appearance was aligned with the philosophy and policies that the subcommittee has been utilizing on all technical issues, which is go to the work group first, present those issues, boil them down, and bring them to the full subcommittee. He was challenged. He contacted the Chair and ATSDR staff, and the logic was that the public meeting was going to be held after the full subcommittee meeting. Mr. Lewis explained that he tries to follow policies and procedures, but after the ATSDR had failed to follow through on many recommendations, he felt it was his duty to at least request the additional meeting.

Ms. Kaplan, Mr. Lewis, and others examined how this subcommittee is interacting with the public and felt that this issue should be brought to the attention of this subcommittee. It was their opinion that a firm recommendation was on the table with regard to whether there would be one or two meetings. Mr. Lewis thought that an afternoon session, similar to the PHAWG meetings, was going to be needed for the EPA. He also thought that the group would need a facilitator who would listen to everyone, so that all of the information could be collected and compiled. He further thought that the group should return to convene a normal ORRHES meeting. He thought that they owed the public that attention.

He said he took full responsibility for this effort. He also believed that the ORRHES had gotten to the point in this process, inside and outside of the ORRHES, that people are feeling either oppressed or they are feeling frightened about doing what is right. He recommended that they ORRHES remove those issues and create mutual trust among the members of the ORRHES and with ATSDR, if these problems were ever going to be solved. He stressed that the process be conducted in an open fashion in order to do an excellent job. He added that they would have some key areas in which they had some recommendations, which they might share later in the meeting that might assist the ORRHES with closing the gap in obtaining mutual trust between ATSDR, ORRHES, and the community.

- ◆ Dr. Davidson explained that she talked to Mr. Lewis after the fact and her response was that she thought that ORIA at EPA had said they were going to come and speak to the ORRHES. They did not come to the December ORRHES meeting because they did not have time. However, the ORRHES did not receive a response with regard to them attending the February meeting, which they would have had time for. They suddenly contacted ATSDR and wanted to be on the ORRHES's agenda. They have outstanding issues with the ORRHES, and so she thought they should come to the ORRHES to address those issues. Dr. Davidson agreed with EPA coming to the June meeting. She reminded the subcommittee that the June meeting would be in Oak Ridge. One issue was that EPA was not going to come to Kingston to discuss Oak Ridge, but since they are coming to the June meeting, that will not be an issue. Also, with regard to the EPA receiving ORRHES materials, that information is sent regularly to the EPA, so ORRHES activities should not be a surprise to them, because they are on the mailing list.
- ◆ Ms. Kaplan addressed two issues: One was her timeline and the other was Ms. Sonnenburg's comment. She explained that the importance of having the timeline information and breakdown that she sees in the system is that if one looked at the June 16, 2003 entry, there was a PHAWG meeting. In those meeting minutes, it says, "James Lewis said that he would like a person from EPA headquarters to come and explain their process to give ORRHES an idea of their stances on certain issues. Then there was a motion for a letter or some other action. She then dropped down to August 18, 2003 where it said that Bill Taylor had said that a draft of the letter to the person from EPA had been prepared. On November 21, 2003, the letter actually went out. The meeting was held December 2, 2003. That is why the EPA did not attend that meeting. They did not receive the letter in a timely manner, even though all those months had passed from the time the ORRHES had asked for the letter. If the EPA is upset and not coming, that is another issue altogether, but another issue is that the ORRHES's process with regard to processing recommendations is broken. The only way to keep the process moving is for the ORRHES to nag.

Ms. Kaplan stated that Ms. Sonnenburg had asked for something tangible, which was in the letter, and she reiterated her earlier regulations which were: A strong recommendation that the EPA meeting be held on Monday evening before the normal ORRHES meeting on Tuesday. She thought that the public meeting needed to be a "free for all." The EPA has their comments and this issue needs to be straightened out. Second, the other work group needs to examine their process. There is a systemic problem with regard to getting things passed through the process. They are not doing a good job to impress upon ATSDR the need

for these public meetings and things like this issue. The ATSDR tells the ORRHES “no” all of the time. Is that reasonable? It may be legal, but it is reasonable? The ORRHES comes together and gives of their time and then ATSDR completely ignores their recommendations.

- ◆ Mr. Richards echoed that the EPA did not receive the letter, which did not go out before the Friday before Thanksgiving, for a meeting in December. That was a closure for EPA Region IV headquarters with ATSDR, which they tried to reflect in the January 9, 2004 letter. Unfortunately, the EPA did not make the February 3, 2004 meeting. The EPA had their Sixth National Superfund Radiation meeting, and all of those people were going to be there, including himself. The ORRHES told him that they did not even have a quorum for the February 3, 2004 meeting. He stated that it was difficult for him to tell someone to attend a meeting when he was not sure that the meeting was even going to take place. With regard to not coming to today’s meeting, it did seem appropriate to push this off because they need to allow more time. EPA would have been there the day before and this day if it had gone through, but it was Region IV’s request for them to be here, not ORIEPA headquarters. They have requested that two personnel attend the meeting.
- ◆ Ms. Kaplan stated that in reviewing the PHA, the EPA put a lot of effort into submitting comments. However, in the Table of Contents, they are not even listed separately and instead are bundled into public comment, even though in the tables they are separated out. The EPA’s comments should be listed in the document, but they are not the public and should be listed separately.
- ◆ Mr. Pereira commended Mr. Lewis for getting the EPA to act based on his letters and their reviews of specific portions of the minutes that he sent them. However, he wanted to react to why the events took place as they did, because Mr. Pereira that stepped in between Mr. Lewis and EPA’s Region IV, in Washington regarding the previous night’s scheduled meeting and today’s meeting. Mr. Pereira said he had also discussed his and Dr. Falk’s reasoning with Dr. Davidson and Mr. Lewis. First, the EPA contacted ATSDR at some point to tell ATSDR that they were attending the April 13, 2004 meeting. At first, ATSDR was elated and shifted the agenda so EPA would have time to talk. However, ATSDR stressed that EPA had to be on the agenda, and that they could not simply be in the audience. The EPA agreed, items on the agenda were shifted around, and the meeting was pushed to later in the day. Then, the notion of the Monday evening meeting arose. After thinking that meeting through, ATSDR wondered if the ORRHES membership knew about the meeting, and whether that was something that the ORRHES should know and have some say in. Mr. Pereira stressed that he did not think the meeting was a bad idea, but he wondered whether it was appropriate for the event to occur with out the official knowledge of the ORRHES. Dr. Falk was informed of everything that had occurred. To the best of Mr. Pereira’s knowledge, the ORRHES, including its Chair, did not have any knowledge of the meeting, except perhaps for a few members that Mr. Lewis might have informed. Then the question regarded whether the meeting was appropriate. Were ATSDR and EPA prepared to conduct this meeting with such short notice? Mr. Paul Charp was going to be at the meeting. Mr. Pereira explained that no matter when the meeting occurred—in June or two years from today—the EPA and ATSDR are never going to agree on how they make their findings. Mr. Pereira stated that although he is not a scientist, he has heard and seen enough to know that is not

going to occur. He suggested is that EPA and ATSDR meet prior to the June meeting to discuss the differences in their methodologies and findings. The purpose of that meeting would not be an attempt to sway either side to the other's way of thinking. Instead, it would serve as a forum for the citizens of the ORR at which the EPA and the ATSDR could explain what the differences are, why there are differences, the meaning of those differences, and how they are applied to health and clean-up. Those are the things that are important to the ORRHES members and the citizens of Oak Ridge. Mr. Pereira said he would embrace the opportunity to assist with the facilitation of such a meeting. Based on all of this information, Dr. Falk directed the Senior Management of ATSDR to discuss these matters with the EPA to hopefully make EPA understand the position of coming in April versus in June for a full, open discussion of the issues. If the ORRHES decides, prior to the regularly scheduled ORRHES meeting, that there should be an open, public meeting, that is not a problem at all. In closing, he explained that after all of the battering that the ATSDR had taken this morning, he at least needed to make his position known as to what occurred in the last few days regarding the previous night's and the 13<sup>th</sup>'s meeting.

- ◆ Dr. Davidson explained that in preparation for that meeting, at the end of the PHA document on the Y-12, is a citizen's guide that explains the differences between a PHA and EPA's Risk Assessment. This was put together by people in ATSDR as well as EPA. So, she assumed that it met the approval of both agencies. In addition, she asked that the minutes from the PHAWG meeting, where Alan Susten discussed the differences between the two agencies' methodologies, be redistributed to the ORRHES members. She asked the subcommittee members to read the section of those minutes related to Mr. Hanley's response to the EPA comments. She said that Elizabeth Cockworth's letter and all of the other letters that have been submitted back and forth between EPA and ATSDR should be revisited, because there are differences between ATSDR's process and the EPA's process, and some of those are discussed in all of those documents. The ORRHES members should review these documents so that they become familiar with the subject matter before the June meeting. The reading should not be difficult as those documents are written in layman's language.
- ◆ With regard to EPA's comments and ATSDR's responses, Mr. Jack Hanley suggested that the subcommittee review comments #127, #155, #160, and #166. These comments are all pertinent to the two outstanding issues addressed in the January 9, 2004 letter, in the Dose Uncertainty Analysis, and in the dose base criteria that the ATSDR utilizes.
- ◆ Mr. Jeffrey Hill recommended that a full subcommittee meeting be held on Monday evening, prior to June's Tuesday meeting, and that the meeting be similar in content to the meeting that was proposed for April 12, 2004. Ms. Barbara Sonnenburg seconded the motion.
- ◆ Dr. Davidson suggested that if the ORRHES had a subcommittee meeting that Monday evening, it should focus on EPA issues. She thought it would be best to have all of the ORRHES members present at that meeting. Mr. Hill asked if Dr. Davidson was suggesting that the Monday meeting would take place in lieu of the Tuesday meeting. Dr. Davidson clarified that it could be in lieu of the EPA being on the Agenda for the Tuesday meeting. She thought that if they were going to have a meeting on Monday evening, all of the subcommittee members should be present.

- ◆ Mr. Hill agreed and reiterated that his recommendation was that the full subcommittee be present at that Monday meeting.
- ◆ Dr. Davidson asked if that should also be an official subcommittee meeting, where they require all subcommittee members to be present.
- ◆ Mr. Hill stated that had been his intent.
- ◆ Ms. Kaplan asked that the Monday meeting be highly publicized, so that the public would be made aware of the meeting. She suggested that it might be a joint EPA/ATSDR meeting, hosted by ORRHES, and then the ORRHES could have the normal meeting on Tuesday.
- ◆ Dr. Davidson reiterated that if there was a meeting, then all ORRHES members should be present.
- ◆ Mr. Hill clarified that his suggestion was that there be a Monday meeting, that all ORRHES members should be present, and then the regular meeting should be held on Tuesday.
- ◆ Ms. Sonnenburg seconded the motion. She said she was somewhat concerned that if the ORRHES did not have a quorum of ORRHES members at that meeting, it might be cancelled. She suggested that the meeting be scheduled as a public meeting and not an official ORRHES meeting. All of the ORRHES members should be invited, but a quorum should not be necessary in order to hold the meeting.
- ◆ Dr. Davidson thought that the ORRHES members were committed to the meeting and would be present.
- ◆ Ms. Sonnenburg asked what would happen if only 12 people showed up.
- ◆ Mr. Hill stated that they would still have the information.
- ◆ Dr. Davidson pointed out that 12 members were a quorum.
- ◆ Dr. Craig pointed out that such things are normally taken care of by a work group. The PHAWG normally meets on the Monday evening before the regular ORRHES meeting. He suggested that they announce the PHAWG meeting as a public, well-advertised PHAWG meeting. Then they would not have to worry about quorums and votes, and the technical issues could be discussed as part of the PHAWG meeting. Then no one would have to worry about how many ORRHES members attended.
- ◆ Ms. Sonnenburg asked if Dr. Craig was willing to chair that meeting. Dr. Craig stated that he would yield the chair to Dr. Davidson or to Mr. Lewis.
- ◆ Mr. Hill preferred to keep the meeting a regular meeting, but on Monday night, prior to the regular meeting, if there is no quorum, then it could be considered an information session. If

anything arose that needed to be voted on, then it could be voted on. He also asked that full meeting minutes be taken, just like a regular meeting.

- ◆ Dr. Davidson indicated that the motion on the table was that the ORRHES hold a full meeting on Monday evening, with ATSDR, EPA, and the public present.
- ◆ Ms. Sonnenburg asked that the motion be amended to state that a quorum would not be necessary at that meeting.
- ◆ Dr. Davidson stated that they could not do that.
- ◆ Ms. Horton explained that if the meeting is a full ORRHES meeting, where minutes are taken, which would be required, then there must be a quorum present. She suggested that the Monday meeting be kept as an open forum meeting, as Dr. Craig suggested. Between now and June, there is enough time to make a press release to announce the meeting and hopefully get the public involved.
- ◆ Ms. Sonnenburg stated that she would withdraw her second, unless the meeting was going to be held the way that Dr. Craig suggested.
- ◆ Dr. Davidson stressed that her issue was that the people who were present that night would not want to revisit the issue again the next day. Therefore, if the meeting was not a full ORRHES meeting, then people would have to have to listen to the same material the next day, and there would be more people at the full ORRHES meeting who had already heard it than people who had not heard it. Having the full ORRHES meeting on Monday was one way of avoiding that situation.
- ◆ Ms. Sonnenburg asked how many ORRHES members could attend the meeting Monday night, June 7, 2004.
- ◆ Dr. Davidson stated that the time would be worked out, but it would not occur before 6:00 p.m.
- ◆ Mr. Pereira commented that the Monday meeting is so specific and so germane to a particular topic, that the encumbrance of having the provisions of the ORRHES, including the formality of the proceedings, the name placards, et cetera, would be quite intimidating to the public. He thought that they wanted the public to participate, not just the ORRHES members. He recommended that they have the Monday night meeting. Every ORRHES member could attend if the wished, and then on Tuesday the ORRHES meeting should take place. He thought that Monday's meeting should focus on the EPA and ATSDR presentation of their positions. He also thought the issues were going to be addressed would take all evening to present. He did not think there would be time for a full ORRHES meeting.
- ◆ Mr. Hill modified his original motion to recommend that the Monday meeting be an open forum meeting and not a ORRHES meeting.

- ◆ Ms. Sonnenburg seconded the amended motion.
- ◆ Dr. Davidson clarified that the motion on the floor was that there be an open forum meeting on Monday, June 7, 2004. The motion was seconded.
- ◆ Mr. Lewis commented that having some kind of facilitation during this meeting would be important, because there would be so much going on that having a party for whom everyone had a mutual respect would be crucial. Mr. Lewis thought that there were some tensions in the community between certain people, the ORRHES, the EPA and ATSDR. He did not know if the EPA needed to facilitate, but he did think that they needed to consider the idea of facilitation, so that everyone would feel like they had been heard.
- ◆ Dr. Davidson responded that all of the technical details would have to be worked out. She reiterated that there was a motion on the table.
- ◆ Ms. Kaplan asked that the ORRHES provide a court reporter to provide verbatim minutes of the Monday meeting. With the ORRHES meeting, they obtain that, but at the PHAWG, they may not. She did not know what the official stance was on that issue. Secondly, Dr. Davidson had expressed a concern regarding repeating on Tuesday what was discussed on Monday. Ms. Kaplan hoped that the information discussed would not be on the agenda again on Tuesday.
- ◆ Dr. Davidson stated that if there were going to be any recommendations for ORRHES from that Monday meeting, then that would have to be discussed again on Tuesday.
- ◆ Ms. Kaplan indicated that there was no need for the ORRHES to rehash the presentations or the general discussion.
- ◆ Dr. Davidson replied that if there were members of ORRHES who were not present at that Monday meeting, then they also needed to hear the information. Otherwise, they could not make an informed decision with regard to voting. So, the whole matter has to be discussed. ORRHES cannot just come in and make a recommendation without having a full discussion.
- ◆ Mr. Pereira added that having the Monday meeting is predicated on the EPA's agreement to be there. What has been discussed with Region IV was related to the full ORRHES meeting. Although he assumed that they would attend the meeting, he could not speak for EPA. He added that as soon as he got back to his office he would contact the EPA to discuss their attendance at the Monday and Tuesday meetings.
- ◆ Dr. Davidson called for the vote. The motion on the table is that the ORRHES hold a public forum on the Monday prior to the June ORRHES meeting to discuss the EPA issues. The EPA Region IV, members of ORIA, ATSDR, members of the public will be in attendance. ORRHES members will attend by choice.
- ◆ Ms. Sonnenburg asked if they should amend the motion to include Ms. Kaplan's wish that a court reporter be present at the Monday, in order to take minutes.



- ◆ Ms. Kaplan seconded the motion.

**Motion**

Mr. Jeffrey Hill moved that the ORRHES hold a public forum on the Monday prior to the June ORRHES meeting to discuss the EPA issues. The EPA Region IV, members of ORIA, ATSDR, and members of the public will be in attendance. This meeting will not be a full ORRHES meeting, and the ORRHES members may attend by choice. It was recommended that a court reporter be present to take verbatim minutes of the public meeting. Ms. Susan Kaplan seconded. The motion carried. It was noted that 3 were opposed.

- ◆ Ms. Sonnenburg pointed out that Ms. Kaplan had two recommendations and Ms. Karen Galloway moved that the second recommendation, which involves a broken public participation process, be sent to the Communication and Outreach Work Group.
- ◆ Ms. Kaplan seconded.
- ◆ Dr. Davidson asked if the recommendation was in writing somewhere.
- ◆ Ms. Sonnenburg indicated that it was located on the back page of her letter. The group has already voted on her first recommendation. She was now addressing her second recommendation, which read, “The EPA controversy over the Y-12 uranium releases illustrates systemic problems that exist within ATSDR and how it interacts with the Subcommittee, attempts to control it, and how it responds to Subcommittee recommendations. Unfortunately, it appears the organization’s public-participation process has broken down, something that threatens to undermine the public’s trust in all the organization’s efforts in Oak Ridge—and not for just the Y-12 uranium releases. A work group should be established to analyze this subject.” Although Ms. Kaplan had asked the ORRHES to establish a new work group, Ms. Sonnenburg added that she did not know that the ORRHES needed to adopt the entire paragraph, because the Communication and Outreach Work Group addresses that subject.
- ◆ Dr. Davidson asked for some additional explanation regarding the recommendation. Is the organization being referred to ORRHES?
- ◆ Ms. Sonnenburg reiterated that she was not recommending that they adopt the entire paragraph, but she was saying that the subject being discussed needed to be given the Communications and Outreach Work Group.
- ◆ Dr. Davidson explained that she was simply asking for clarification to ensure that she understood the recommendation.
- ◆ Ms. Kaplan clarified that “organization” referred to ATSDR because the ORRHES refers items back to them. Things do not seem to proceed in a timely manner.
- ◆ Dr. Davidson asked if she was referring to ORRHES recommendations.

- ◆ Ms. Kaplan stated that the EPA timeline reflects a problem with the recommendation process. The EPA issue is one example, but it could be anything that the ORRHES is attempting to push through. Things are dropped and do not move forward. She suggested that someone needed to talk about the issue, and it did not matter whether the issue was addressed by an existing or a new work group.
- ◆ Regarding Ms. Kaplan's timeline, Dr. Davidson asked if she was referring to recommendations because recommendations are the only thing to which the ATSDR has to respond. They are not required to respond to individual comments made at meetings.
- ◆ Ms. Kaplan indicated that she was referring to requests such as asking that a letter be written to invite someone to come to the meeting. Those things drag on forever. How can those tasks be expedited? There is not much time left and the ORRHES cannot let every issue drag out for a year like the letter did. What is wrong with the process? What can the ORRHES and ATSDR do better? Where should that issue be discussed?
- ◆ Mr. Pereira responded that at the ORRHES meeting, any issue that is significant enough that ATSDR should respond to verbally or in writing, should go to Ms. Horton as an action item. Before the conclusion of the ORRHES meeting, action items should be reviewed one-by-one. Ms. Horton should read the list of action items for the day and everyone should concur with those. Those action items then become a matter of record that Ms. Horton tracks as action items in a database. The status of those action items are reviewed at every meeting. He suggested that perhaps the action item process needed to be followed closely to ensure that all the bases are covered.
- ◆ Ms. Kaplan explained that was only for ORRHES. The issue under discussion was handled in PHAWG. PHAWG and the other work groups are handled in a different manner than ORRHES. They are not as formal. Still, she thought that the entire process needed to be reviewed, because it is moving too slowly, and this illustrates a problem.
- ◆ Regarding the PHAWG, Mr. Pereira replied that whatever PHAWG recommends should come before the ORRHES as well.
- ◆ Ms. Kaplan still thought the process needed to be examined.
- ◆ In terms of the June Monday evening meeting, Dr. Malinauskas said he was concerned. The proposed subject was to discuss the issues with the EPA. That is quite vague. Mr. Pereira indicated that the ATSDR intends to meet with the EPA prior to that June meeting, in order to come to a meeting of the minds, not with respect to methodology, but to the inferences to the results or the application of that methodology. He strongly recommended that ATSDR and EPA meet, clearly define the meeting objectives, and agree to what would be discussed at the June 7, 2004 meeting, because he would hate to see EPA talking about harvesting oranges and ATSDR talking about planting turnips.
- ◆ Dr. Davidson asked Dr. Malinauskas' to write down his recommendation as an action item.

- ◆ Dr. Malinauskas indicated he would do so.
- ◆ Dr. Davidson stated that if there were additional details to be worked out regarding the proposed June 7, 2004 meeting, those could be worked out later, so that the ORRHES could continue on with the meeting.
- ◆ It was pointed out that there was still a motion on the table.
- ◆ Ms. Sonnenburg reiterated that the #2 item on the second page of Ms. Kaplan's letter should be sent to the Communications and Outreach Work Group for consideration, and Ms. Kaplan seconded the motion.
- ◆ Mr. Lewis thought that it would be more appropriate to send the issue to the Guidelines and Procedures Work Group.
- ◆ Ms. Sonneburg amended her original motion to indicate that the issue should be sent to the Guidelines and Procedures Work Group instead of the Communications and Outreach Work Group.
- ◆ Ms. Robinson, from Cambridge Communications, asked the group to please remember to use their microphones.
- ◆ Dr. Craig stated that he did not think the ORRHES needed to vote on this issue because they sent items to the work groups all of the time.
- ◆ Dr. Davidson stated that she would talk to Ms. Kaplan to make sure that she understood all of the nuances of the issue, so that she could provide instructions for the work group.
- ◆ Ms. Kaplan asked if they were not agreeing to send it to the work group.
- ◆ Dr. Davidson clarified that she simply wanted to get clarification regarding what she was sending to the work group.
- ◆ Ms. Kaplan asked for clarification on whether the issue was going to be sent to a work group.
- ◆ Ms. Sonnenburg asked Ms. Kaplan to put the recommendation into specific language.
- ◆ Ms. Kaplan indicated that there seem to be procedural problems with regard to the way that recommendations and action items from the ORRHES are being forwarded for action to the ATSDR. She recommended that the second bulleted item on page 2 of her letter be forwarded to the Guidelines and Procedures Work Group, so that they could examine ORRHES's procedures and determine how they might speed up the processes.

- ◆ Dr. Davidson agreed, but said she still wanted to meet with Ms. Kaplan, to make sure that the subcommittee understood what she is recommending. Since the issue was going to be forwarded to the work group she asked Ms. Sonnenburg to withdraw her motion.
- ◆ Ms. Sonnenburg stated that she would withdraw her motion if Dr. Davidson affirmed that the issue was going to be forwarded to the Guidelines and Procedures Work Group.
- ◆ Dr. Davidson affirmed that the issue would be forwarded to the Guidelines and Procedures Work Group. She reiterated that she still wanted to meet with Ms. Kaplan, to ensure that she understood the recommendation correctly and that she is interpreting the paragraph in the same way that Ms. Kaplan is interpreting it.
- ◆ Ms. Sonnenburg indicated that she thought what Ms. Kaplan was proposing was quite clear. She asked if Dr. Davidson did not understand Ms. Kaplan's motion.
- ◆ Dr. Davidson responded that Ms. Kaplan did not make a motion.
- ◆ Ms. Kaplan affirmed that she just made a motion.
- ◆ Dr. Davidson stated that she was unaware that she had made a motion.
- ◆ Ms. Sonnenburg stated that Ms. Robinson could probably read the motion back to the group.
- ◆ Dr. Davidson explained that she had not heard her comment as a motion. She thought she had been explaining the paragraph, because Ms. Sonnenburg had withdrawn her motion and the group was going to send the items to the work group.
- ◆ Ms. Kaplan replied that was fine, but she did put it into the form of a motion because she thought she was asked to, so that the ORRHES could send it to the Guidelines and Procedures Work Group. She suggested that if the group needed a motion she had already stated, that they could probably read back.
- ◆ Dr. Davidson pointed out that if there were a motion, then the ORRHES would have to vote.
- ◆ Ms. Sonnenburg asked Ms. Robinson to read the motion back to the group.
- ◆ Ms. Robinson read from her summary notes, indicating that Ms. Kaplan had said that there seemed to be procedural problems with regard to the way that recommendations and action items from the ORRHES are being forwarded for action to the ATSDR. She recommended that the second bulleted item on page 2 of her letter be forwarded to the Guidelines and Procedures Work Group, so that they could examine ORRHES's procedures and determine how they might speed up the processes.
- ◆ Dr. Davidson indicated that the Chair has heard the proposal and suggested that the recommendation be left as a proposal. She added that the recommendation would be sent to the Guidelines and Procedures Work Group, so that the ORRHES meeting could continue.

- ◆ Ms. Donna Mosby pointed out that what the second bulleted item was saying was that from time-to-time people will bring things or say things and there is no action taken upon it. What this recommendation is saying is that when someone brings something up that is worthy of the subcommittee's review and consideration, it should not fall into a black hole and nothing happen. She did not know if they could write a procedure that would help with that process, but it does need to be examined, because it is unclear why things move so slowly. When someone brings something to the issue, is there some kind of action that can be taken right then?
- ◆ Ms. Kaplan added that someone should at least respond to the item or ensure that things move on in a timely manner.
- ◆ Dr. Davidson stated that there had been enough discussion on this issue and the ORRHES needed to move on to the next issue. She also informed Mr. Pereira that she was going to move his project management status update to just before the unfinished business. She then turned the floor over to Dr. Paul Charp.

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### **Response to ORRHES Comments on the Initial Release of the White Oak Creek PHA**

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*Dr. Paul Charp, Chair*

*Federal Facilities*

*Agency for Toxic Substances and Disease Registry (ATSDR)*

Before he began his presentation, Dr. Paul Charp stated that he wanted to clarify something that was brought up by Ms. Kaplan and reiterated by Ms. Sonnenburg, in relation to the quote in the PHA from the EPA. First, Mr. Richard's comment about the "upper range" was correct. However, he wanted to show the group from where they obtained the "clean up" verbiage. He stated that Mr. Richards had mentioned the directive. Dr. Charp displayed the cover page for directive number 9200.4-18, from the ORIA. The title of this memorandum is called the "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination." CERCLA is the acronym for Superfund, and it stands for the Comprehensive Environmental Response, Compensation, and Liability Act. He pointed out, on page 5 of this 22-page document the phrase that says that when a dose assessment is conducted at the site, then 15 millirem per year effective dose equivalent should generally be the maximum dose limit for units. The ATSDR obtained the 15 millirem per year clean-up level from this EPA document. The document goes on to say, "This level equates to approximately  $3 \times 2^{-4}$  increased lifetime risk and is consistent with levels that are generally considered in other governmental actions, particularly regulations and guidance developed by EPA and other radiation control programs. That is where ATSDR obtained the verbiage that appears on the fact sheet that Mr. Richard clarified in more precise, non-governmental language. Dr. Charp noted that ATSDR stood corrected and would make the proper adjustments on the language, so that it could be directly referenced to the displayed document.

Dr. Charp then reviewed some of the responses that the ATSDR received on the White Oak Creek PHA to illustrate what the ATSDR did in response to these comments. He directed the group to their handouts on this issue, which included comments submitted to ATSDR from the ORRHES as well as the DOE and the EPA. Overall, there were sixteen pages of these comments. On page two was a flow chart that was developed by Dr. John Merkle. Dr. Merkle stated that the ATSDR should provide a flow chart for all of the calculations of the scenarios that the ATSDR selected in the PHA or in Task 4. Dr. Charp indicated that when he worked all of the calculations for the PHA, he had done them on a spreadsheet, and did not go through flow charts and so forth. However, the ATSDR would probably choose several different scenarios and fill in the blanks for this type of flow chart.

On page 4, one reader commented that the PHA document should have better maps. For example, the map of X-10 did not show where the storage tanks were located within the facility. ATSDR has added the map displayed on page 4 of the comment document. The new map details the location of the gunite tanks in both the North and South Tank Farms at the X-10 site. On page 5, one ORRHES member asked that the PHA include a table showing the radioactive and biological half-lives of the pertinent radionuclides. Table 6 and its accompanying explanations were sent to the ORRHES and added to Section II.W. Health Effects Evaluation Process of the PHA to explain radioactive and biological half-lives. Radionuclides of concern in the PHA are presented as examples in the table and detailed in the descriptive text.

Dr. Charp explained that the body removes compounds as a function of the biological elimination of that particular compound from both the specific organ and the body. Likewise, radioactive materials are removed from the body. Because the material is also radioactive, with a defined radiological or physical half-life, the combined elimination rate is called the effective half-life. The effective half-life can be determined from the combined physical and biological half-life. For example, as shown in Table 6, the radiological half-life of strontium 90 is about 29 years and the biological half-life is about 49.2 years (18,000 days) for bone. Therefore, the effective half-life of strontium 90 deposited in the bone is 17.5 years (6,400 days). Table 6 shows the half-lives of selected radionuclides in the White Oak Creek Public Health Assessment as follows:

<b>Radionuclide</b>	<b>Physical Half-Life</b>	<b>Biological Half-Life</b>	<b>Effective Half-Life</b>
Tritium	12.3 years	12 days (whole body)	12 days (whole body)
Cesium 137	30 years	70 days (whole body)	70 days (whole body)
Strontium 90	28.8 years	18,000 days (bone)	6,400 days (bone)
Cobalt 60	5.3 years	9.5 days (whole body)	9.5 days (whole body)
Yttrium 90	64.2 hours	14,000 days (bone)	64 hours (bone)

Page 7 includes the DOE comments. The DOE sent in general comments and editorial comments. The first few comments related to their Comprehensive Epidemiologic Data Resource (CEDR), so the ATSDR included references with regard to how CEDR could be accessed and what the CEDR database is. For the second reference, ATSDR added a sentence to Section II.F.2. TDOH that stated, "All of the technical reports produced for the TDOH Oak Ridge Health Studies are accessible in portable document format (PDF) at <http://cedr.lbl.gov>.

On page 8, the DOE noted that Figure 5 was missing. At the time the draft document had to be distributed, Figure 5 was not ready. Figure 5 is a timeline that details the major processes, environmental data, and public health activities associated with the X-10 site. The figure is an oversized document that measures 11" x 17" and will be incorporated into the public comment version of the PHA.

On page 11, comment #17 in the DOE comments suggests that the ATSDR should improve the wording here by replacing "human" with "average American." Dr. Charp did not think there was any such thing anymore because the United States is a melting pot. So, the "average American" could be Asian, Native American, Caucasian, African American, et cetera. Instead the wording was replaced with the following: "ATSDR, in its evaluation of the radiation doses associated with the Oak Ridge Reservation, has used site-specific parameters and variables more related to the Southern lifestyle than to the typical U.S. population." He noted that most people in Oregon are not really going to be worried about what somebody who lives East Tennessee is eating.

Finally, the EPA sent in several technical comments and a few editorial comments. The EPA technical comment #1, on page 12, stated that the EPA wanted ATSDR to clarify for iodine whether it was iodine-129 or -131. ATSDR has modified the text to clarify that iodine-131 (not I-129) was included in the Task 4 study. The document now gives more information on the Task 4 study and indicates that that information could be obtained from the State of Tennessee's web site. The web site is also given.

### **Discussion Points:**

- ◆ Mr. Richards explained that the dose equivalent given for the upper end of EPA's risk range, where they always start at 10-6 and if they do a comparison dose, the upper end will be 15 millirem. They do not, however, say that is their clean up level. They had hoped to do that in 1996 or 1997, but it did not work. So the "risk range" is the official terminology.
- ◆ Dr. Malinauskas thought the effective half-life for strontium 90 in bone was less than Table #6 indicated. It should be somewhere between the physical half-life and the biological half-life.
- ◆ Dr. Charp responded that he would check those calculations and let them know before the meeting was over.

Dr. Charp then indicated that Mr. Jack Hanley wanted to review the fact sheets with the ORRHES, so that they could understand how they were developed.

**Mr. Jack Hanley**  
**ATSDR/DHAC**

Mr. Hanley explained that in response to outstanding issues regarding the EPA issue, and after the January 9, 2004 letter from EPA Headquarters, the ATSDR attempted to take the information in the PHA and develop a response in the form of three community-friendly fact sheets entitled:

- ATSDR's Cancer Comparison Value
- Uncertainty Analysis
- Screening and Regulatory Dose Limits

Of all of the comments received from the EPA, there were only two outstanding issues. Those have been simplified in these documents. One of them was the comparison value that the ATSDR uses as a screening tool. Basically, the doses that the ATSDR estimated in the Y-12 Uranium PHA are lower than not only ATSDR's comparison value of 5,000 millirem over 70 years, but also, if analyzed, it is less than the EPA level of 15. Therefore, with regard to past exposure, the ATSDR estimates 155 millirem over 70 years, which is only 2 millirem per year. The EPA's upper limit is 15, and if one takes 5,000 millirem and analyzes that, it comes out to approximately 71 millirem per year. To assist the ATSDR with comparing like items, the ATSDR broke it out into 70 year and the annual doses.

Mr. Hanley then addressed the handout on the Screening and Regulatory Dose Limits. The purpose of this document was to compare dose limits with other regulatory levels. The comparison values used, which Dr. Charp mentioned several times, were based on a literature review and other documents. If one compares doses on an annual basis, then takes the 5,000 millirem, and on an annual basis it is 71, which is lower than the International Commission on Radiation Protection (ICRP), and the National Council on Radiation Protection and Measurement (NCRP) criteria for the public, the result is the EPA clean-up level of 15. He pointed out that if they do what is called, "first approximation" of 5,000, over 70 years, it is still in that range between the other regulatory agencies. They have the worker exposures with a maximum of 5,000 millirem per year. Mr. Hanley reiterated that this was a screening tool. If the dose comes out above the 5,000, then ATSDR could do a more in-depth evaluation using real, site-specific exposures to look at levels where health effects take place and try to determine what the likelihood is of an effect taking place. These doses that ATSDR estimated are lower than the past and occur much lower than these comparison values.

On the back of the Screening and Regulatory Dose Limits document is the Thermometergraph, which has been modified. This graph is somewhat different in that the scale is different from the previous one. This is millirem above background. He asked the group to remember that background is 360. Mr. Hanley pointed out the sources for background, the largest source being radon, and then continued to read the rest of the thermometergraph dose limits and estimated doses for Scarboro and typical doses from ionizing radiation sources.



Dr. Hanley next discussed the third document, which was ATSDR's response to comments regarding the appropriateness of uncertainty analysis in the Y-12 Uranium PHA. This topic has come up in meetings several times, and Dr. Charp used criteria from NCRP commentary 14 to determine if there was a need to do uncertainty analysis. There are two basic criteria. The first is, "if conservatively biased calculations indicate that the risk from possible exposure is clearly below regulatory or risk levels of concern, a quantitative uncertainty analysis may not be necessary." The ATSDR used conservatively biased calculations when estimating radiation doses from the Y-12 uranium exposures. Thus, the estimated radiation doses in the ATSDR Y-12 Uranium PHA are highly unlikely to underestimate the true dose. Furthermore, the estimated uranium doses are clearly below regulatory and health levels of concern, and any further detailed analysis will likely demonstrate that the true dose is even less. Thus, a quantitative uncertainty analysis is not recommended by the NCRP, and ATSDR has determined that it is not necessary." Mr. Hanley stated that the table at the bottom of the page demonstrated the number of times lower the screening estimates are than the comparison values. He indicated that the same material that was included in these more community-friendly documents was presented in much more detail in the PHA.

**Discussion Points:**

- ◆ Dr. Craig asked for clarification on the numbers in the last row on the Screening and Regulatory Dose Limits handout. Mr. Hanley indicated that the number was over 70 years. That is the current data based on 70 years, using EPA data.
- ◆ Ms. Kaplan stated that the reviewers made comments regarding the fact that Scarboro has a tendency to be chosen as the primary public health concern for uranium, simply because it is the community closest to the facility. The reviewers say that this is premature and that further analysis of population distribution, wind patterns, and surface water features are needed. Although she knew that it was not within the ATSDR's mandate to use existing data, she asked who would be looking at existing data with regard to future activities, to future research. Mr. Hanley asked Ms. Kaplan what she meant by "future research." She clarified her comment, asking him who was looking at wind patterns, surface water, and other future exposures. Mr. Hanley stated the ATSDR considers future exposures, and if it is a scenario, ATSDR can examine it and give its opinion with regard to public health issues. He said that he would talk to her after the meeting.
- ◆ Ms. Adkins asked if anyone has, or if it was possible, to do something like a full body count on the people who would have been the closest and who are the oldest with regard to radioactive exposure, including the bodies that have already been buried. The count should include all of those people, living and dead, who might have had maximum exposure. She explained that so far, all of the numbers have been estimates. She wondered if anyone has actually counted all of those people. Dr. Charp responded that that had not been done for people in the Oak Ridge Reservation, but some of the bodies of radium doll painters have been exhumed to measure the actual whole body counts for radium, as opposed to the estimated dose. These doll painters were high school-aged women who painted the radium on the dolls in the 1920s and stopped during the 1930s. Usually, if someone had an intake

of, for example, Uranium, they would do a lung count to determine what the lung burden was. He did not know what the minimal concentration would be before a count showed positive.

- ◆ Dr. Craig explained that it was thought that Scarboro was the area of greatest deposition. Obviously, it was not, with the least concentration of people. For example, Dr. Craig suggested going to the east end of Y-12, past the process buildings, all the way through the ORNL buildings, out to the open area, out in front, where the sign is. Then going down Union Valley, across Highway 62, through the old land fill that is not used, but which is now a driving range, and then hit Roger's Quarry. No people ever lived there, down in that whole main valley, which is where the wind blows. Certainly, one has to look at who the receptors could have been, and who the most likely receptors were another 200 feet, up and over the hill, where the wind did not blow, but probably those were the greatest receptors. That seemed to be the point people were attempting to make. Beyond that is Melton Hill Lake. So, there a contaminant is traveling that has not lifted very high in the air because it is extremely heavy, and all of the models would show that there is not going to be a receptor down that way.
- ◆ Ms. Kaplan emphasized that was the point that she was attempting to make. There are past, current, and future exposures. What are the future land uses? What is the depth of contamination in the soil? Is there any effort or planned effort to do any soil sampling? One of the reviewers greatest complaints was that ATSDR needed to do core sampling, because others (Florida A & M) have only done surface sampling. Mr. Hanley pointed out that the EPA conducted core sampling. Ms. Kaplan asked for the data from that study.
- ◆ Mr. Richards stated that the EPA is looking at the off-site areas. They may not have been covered before, but as part of the future assessment, going to Superfund sites is being done. Ms. Kaplan asked if the ORRHES would be informed of that effort. Mr. Richards explained that was part of the normal CERCLA process. At this point, they do not have the effort on the timetable, but normally, when nearing the end of a clean up, those things are done. For example, in Paducah, Kentucky, some of those outside areas have already been addressed, which are natural fish and wildlife areas. Then there is the ongoing Clean Air Act program, which Tennessee has been delegated, that still looks at offsite pathways of uranium releases from Y-12. Those are still on-going. That is their job, to set some doses to the nearest business, school, or home. So, they would just look at the nearest business that is not a DOE property.
- ◆ Dr. Chorp added that in the health assessment, the ATSDR looked at air concentrations and found some new samples that were collected off-site well down toward Clinton and Claxton. ATSDR looked at the uranium content in some gardens and the foods. They did not find anything of particular interest, or even above background, which is pretty remarkable considering the steam plant there with all of the coal and lye ash.
- ◆ Dr. Davidson said it was her understanding that if there was any additional soil sampling to be done in this area, it would be done after this PHA process was completed. She asked if that was anyone else's understanding. Other agreed. Dr. Hanley affirmed that was correct.

- ◆ Part of that is the post-facilities agreement, looking at all the CERCLA waste at all three ORR sites. He did not have a timeline citing this. Scarboro was another issue based on TB and other things.
- ◆ Mr. Donald Box had issues with the Cancer Comparison Value document. He said ATSDR mention that these doses are in addition to background doses. That should be stated on all of the handouts. Mr. Hanley and others agreed that was a good point, and said they would add something along those lines.
- ◆ Regarding the 70-year lifetime dose, Mr. Richards asked whether NCRP and ICRP use a different lifetime. He thought that they used a 50-year lifetime. He knew that ATSDR was extrapolating the 70-year, but he recommended that if the others are using a different lifetime, then the ATSDR should use an asterisk to indicate that this is the way that the ATSDR calculates the lifetime dose. The EPA does not recognize that number because they have extrapolated the 70-year lifetime from CERCLA's 30-year lifetime. Dr. Charp indicated that ICRP 30 was for workers and the extrapolated things from over a 50-year working life span. After Chernobyl, in 1986, they saw that they needed to start doing it for public exposures, and they began to calculating dose conversion factors for infants. He thought that somewhere buried in that information was something about 70 years and an ICRP 60 further up the line.
- ◆ Mr. Richards asked if they actually calculate from the 7,000 in their documents. Dr. Charp responded that they did not.
- ◆ Mr. Hanley explained that, in the narrative, the ATSDR has the first approximation of the ICRP and recommended dose of 100.
- ◆ Mr. Richards stated that he was just making it clear that the ATSDR has calculated that for its own purposes. Mr. Hanley responded that they did that so they could compare the ATSDR's numbers with others' numbers.
- ◆ Mr. Richards also recommended using EPA's upper range for an upper level. He suggested that they might use NRC's clean-up level, because theirs was 25 millirem. He thought that would help, with another comparison of a clean-up number instead of the public exposure.
- ◆ Dr. Davidson thought it also sounded like that there should be some footnotes on some of the calculations.
- ◆ Mr. Hanley stated that there were many regulations that they could have located that contradict each other. Therefore, they attempted to find ones that fit the circumstances on which they were working. That is why they picked these particular numbers. Also, regarding, the 25 millirem for the NRC, ATSDR wanted to say out of the controversy going on between the regulations limit.

- ◆ Mr. Hill asked if the CFR used a 70 or 50-year lifetime. Dr. Charp responded that the CFR did not use anything. It only states that the dose limit to workers and the general public is not to exceed 100 millirem per year.
- ◆ Mr. Hill suggested that if they took the ATSDR's 5,000 over 50 years, they would be right at the 100, which is the limit. It is interesting that ATSDR uses 70. As a worker, he is used to seeing 50. And if ATSDR uses 50 in these documents, then they are right back at the 100, which is the magic number.
- ◆ Dr. Charp indicated that another issue is that if someone has an intake when they are 50 years old, and it is calculated over 70 years, he did not expect them to live to be 140 years old. So, that is overestimating.
- ◆ Ms. Adkins appreciated the data, but in order to convince the community and in order to convince her, she asked if there was any way that the ATSDR could balance the speculation with the opportunity for people to have whole body counts, to be tested for the various things that they are going to go through over the next several months. If everything is based on conjecture, they can rationalize that there is no problem and that there has never been a problem. Everything is wonderful. However, people are not going to believe it until they are given proof that they have not been harmed by the effects of Oak Ridge. She said she would continue to bring this up at every meeting until someone could come up with a way that people can be checked to see if they have been hurt by radiation exposure. Then they will believe it.
- ◆ Dr. Charp admitted that he was not an internal dosimetry expert or an expert on whole body counting, but he did know that the average concentration of the uranium in the soils around Oak Ridge, when one adds up all of the isotopes, is approximately 3 picocuries per gram. The total uranium in the human body is somewhere around 31 to 35 picocuries per gram, based on the water someone drinks, the food they eat, et cetera. Thus, the question is: Is the whole body counting sufficiently precise to detect the 10% variation in the uranium in the body? He did not know himself, but that would be one of the larger problems with whole body counting, because he did not know how precise it was. He said there are many experts at the lab who would be the ones to explain the limitations of whole body counting. When he was looking at some radium problems in Philadelphia, where people were actually sleeping on beds that were 1,000 times above the clean-up level in a nuclear power plant, ATSDR estimated that they would have to have 1,000 times more radium in their body than is normally present before they would see any effects. The people who the ATSDR talked to, who do the whole body counting, said that it would not be worthwhile to do it unless someone had thousands of times more radium in their body. Uranium is even more difficult to check by whole body count, so he did not know if it was feasible and thought it would be very difficult to show something.
- ◆ Dr. Davidson wondered if it would be possible to find out what the minimum detectable levels would be for whole body counting. She knew that the lower the levels the longer one would have to count, because this is done for worker exposures if they are suspected of having high level exposures.

- ◆ Ms. Karen Galloway replied that she did not know the answer to Dr. Davidson's question, but she worked for people who would know. She offered to bring her supervisor to an ORRHES meeting.
- ◆ Dr. Davidson thought the other question regarded how much above background someone would have to have in order to have detectable, whole body counting. She reminded the group that they were talking about environmental exposures as opposed to occupational exposures.

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### Public Comment Period

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*Dr. Kowetha Davidson, Chair*  
*Oak Ridge Reservation Health Effects Subcommittee (ORRHES)*

Dr. Davidson then announced the public comment period and asked if anyone would like to speak. With no members of the public coming forward, Dr. Davidson asked the group to continue their discussion regarding the community friendly handouts until a member of the public was ready to address the ORRHES.

**Discussion Points:**

- ◆ Mr. Lewis applauded ATSDR for consolidating some of the key issues within the body of the community-friendly documents. He thought that they had made a good attempt to get the key points down in a way that lay people could understand them. Mr. Hanley credited Ms. Melissa Fish for her efforts because she did a lot of the work that went into creating these documents.
- ◆ Mr. Lewis said that although there may be resource constraints, when one is dealing with controversial issues such as the issues with EPA, documents like this should be presented to the ORRHES in advance of asking for its endorsement, so that everyone can have a better and clearer understanding. He noted that Dr. Malinauskas and others had asked for a document that was approximately ten pages. Timing is everything. He did not know how the various branches worked at ATSDR, but these types of efforts, in his opinion, helped to improve the properties. This is what Ms. Kaplan was talking about. Whatever it is that ATSDR is doing, they need to get this kind of information down to this subcommittee level as early as possible, and he knew that it should be done prior to asking the ORRHES to review and endorsing these documents.
- ◆ Mr. Hill stated that he was getting confused on the thermometergraph. When he looked at it, and then looked on the right hand side in red, "Doses below 5,000 mr over 70 years are not expected to result in adverse health effects. Doses at 5,000 mr per year are not expected to result in adverse health effects." He thought that would also be a safe statement. He was hoping that a layperson would read that and say, "Well, gosh, above 5,000 mr over 70 yrs, you would expect health effects." When, in fact, a factor of 10 or 100 or even 1000 could occur before one would expect health effects. It is a bit misleading, and if someone looks at

this document and then nothing else, they would think that doses above 5,000 mr over a 70-year period would result in a health effect, when it is actually some number far greater than that. Mr. Hanley suggested that the phrase could be wordsmithed to get that point across.

- ◆ Mr. Hill pointed out that someone would be up to 5 r before any of the documents needed to say that some health effects may be observed. Dr. Charp explained that for acute health effects, it would be approximately 25,000 when blood effects would begin to be seen. Some studies suggest, for shipyard workers, something around 2,000 to 3,000 millirem. Mr. Hill asked if that was chronic effects. Dr. Charp affirmed that would be for chronic effects.
- ◆ Mr. Richards pointed out that this has always been one of EPA's fundamental disagreements, but clarifying that they are talking about acute effects and not chronic effects is still one of the key points left out of these documents. Of course, everyone would always agree that acute effects would occur at around 10,000 or 25,000 millirem, but obviously, the EPA fundamentally disagrees with this position and only looks at adverse health effects and chief effects. They look at the potential incidences of cancer, and even in a lot of creek studies, they look at moderately increased cancer, and that carries an amount criteria for fish advisories. 1 in 1,000 to do to a fish advisory on PPBs. ATSDR and EPA look at chronic, long-term cancers differently, which is unfortunate. That was one of the issues he was hoping the EPA headquarters and ATSDR could address, but he did not know if that was going to happen. Nevertheless, it needs to be clear in the documents when talking about adverse public health effects that are acute and not chronic.
- ◆ Dr. Davidson asked for clarification on Mr. Richard's comments. He wondered what Mr. Richard's bottom line comment was related to the thermometergraph. Mr. Richard said he believed that the ATSDR was referring there to acute health effects, going off of Mr. Hill's comments about the 5,000 millirem per worker. Again, just like the  $10^{-4}$  risk range is not based on acute health effects, it is based on long-term chronic health effects and the potential increase of cancer. He thought that one thing that has been left out of these documents was that ATSDR should clarify which numbers related to acute adverse health effects and which relate to chronic health effects. Dr. Charp responded that 5,000 over 70 years is for chronic, long-term exposures.
- ◆ Dr. Davidson suggested that they could probably safely say that anything averaged over 70 years would be chronic, because they are looking at a dose for over a period of 70 years. Dr. Charp explained that over seventy years would be chronic exposure. Mr. Richards asked if the minimum risk levels (MRLs) were set on acute. Dr. Charp responded that they were not set on acute. The toxicological profile for uranium shows that there is an acute MRL and an intermediate MRL. Depending on what the top of the compound is, there could be acute, intermediate, and chronic MRLs. Mr. Hanley agreed that there could be an MRL if the data was available, on any contaminant, in acute (less than fourteen days); intermediate (less than a year); and chronic levels (more than a year exposure). Therefore, depending on available data in the literature, they could have three different MRLs, depending on the type of exposure.

- ◆ Dr. Craig added that radiation is all chronic, so they would only have chronic with a toxic chemical. There is not an acute unless someone is opening up a reactor.
- ◆ Dr. Chorp explained that someone actually developed an acute exposure at 400 millirem, but they did state that the chronic MRL for ionized radiation goes with 100 millirem per year, and that was based on the fact that they could not find any studies. MRLS are not cancer. The people who developed the TOC profile could not find any studies where the endpoint was not cancer. So, they could not develop a true MRL that had non-cancerous results. Therefore, they said, “Well, we can’t find any studies that serve as a non-cancer health effect. We know people who are exposed to the U.S. air are exposed to about 160 millirem per year. So, based on some fudge factors, they decided to take the average annual background in the U.S., divide by three, and then round it down to 100 as the MRL. They say that any exposure to less than 100 millirem per year would most likely not have any non-cancerous health effects. That is the true definition of the MRL as Dr. Chorp perceives it.
- ◆ Dr. Davidson said that someone could have a chronic exposure, which is exposure occurring over a very long period of time, and someone can have a chronic effect. The chronic effect can occur from an acute or a chronic exposure. If a person received a dose of 5,000 millirems at one time, and that person is being studied over 70 years, one is looking for a chronic effect with an acute exposure, because the exposure occurred within a short period of time. However, an acute exposure can result in chronic effect. She believed this was confusing some people.
- ◆ Dr. Davidson announced that a member of the public wished to address the ORRHES.
- ◆ Ms. Janet Michelle introduced herself and explained that she had a comment about the current discussion. Several years ago, she found a study that was done in France which had to do with low dose, chronic exposures to radiation. They did find an unusual health effect. They found that an autoimmune process began in the heart muscle that led to heart failure. She never heard that one before, and she reminded the group that there had been many heart attacks in the work force at ORR. She did not remember the name of the study, but she offered to find it for the subcommittee. Dr. Davidson asked her to please send the information on that study to the ORRHES, so that they could review it. She asked Ms. Michelle to send the information to Mr. Bill Taylor in the Oak Ridge field office. Dr. Davidson then asked if there was another member of the public who wished to speak. After no one stepped forward, Dr. Davidson instructed the group to continue their discussion.
- ◆ Mr. Jeff Hill asked that it become an action item to distribute the study information from Ms. Michelle, if the ORRHES receives it.
- ◆ Mr. Lewis stated that he had had an opportunity to look at one of the finer documents, the one that Ms. Fish produced on past and current exposures. He asked if anyone had a copy of that document. After receiving a copy of the document, Mr. Lewis indicated that the way that ATSDR uses its language, it seems that they do not expect issues for current exposures. However, they use the same language for both the past and the present exposures. They talk about how the levels of uranium that people might be receiving today are not a public health

hazard. ATSDR does not expect kidney problems, cancers, et cetera. That makes good sense for the present, because there are no issues currently. However, when ATSDR talks about the past, they use the same language. The past includes the years of 1944 to 1995 and, according to the ATSDR, they do not expect any kidney problems, cancers, et cetera from past exposures either. ATSDR says that there are no data, but people do not believe that the exposures they have received in the past are not causing them problems. Mr. Lewis asked that any data available about health outcomes from past exposures be included in the PHA, otherwise, it cannot be explained clearly to the public.

- ◆ In response to Mr. Lewis, and in going back to the reviewers listed in the PHA's appendix, Ms. Kaplan pointed out that the reviewers specifically say that there could be some incidences of cancer in Scarborough, caused from uranium exposure. The problem is that they cannot prove it. There are no data. No one has the statistical ability to go in and make a statement. Also, if 2 or 3 cancers were caused by exposure, what is anyone going to do? There is no recourse set up to deal with that. Also, in response to Mr. Richard's original statements regarding "chronic" and "acute," she thought that comment was in response to Mr. Hill's attempt to interject about the 5,000 millirem per year for workers. So, Mr. Richard's statement is for acute effects or chronic. She just wanted to draw the group back to that comments, because she did not think that original statement was clarified.
- ◆ Mr. Richards said his initial comments were made in response to Mr. Hill, that he was confusing work with the public. He was also attempting to make the comment that the EPA would say that potential cancer at 5,000 millirem over seven years was still a health effect that would be above the EPA's level of concern. Ms. Kaplan responded that those were the issues that the ORRHES would like to at least hear about and understand.

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### ORRHES Web Site Redesign Review

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*Ms. Susan Robinson, Team Lead  
Health Communication Team  
Division of Health Education and Promotion  
Agency for Toxic Substances and Disease Registry*

Ms. Robinson introduced herself and indicated that the ORRHES has been asking for quite awhile to have the web site redesigned. The team has been quite busy working on some documents for the subcommittee on which she would like some feedback. After distributing copies of her presentation, Ms. Robinson explained that the first idea was that the current ORRHES web site, which is focused on the subcommittee's needs, will become a community web site for the ORR about the health activities in the area. Therefore, the new site will be designed to meet the needs of multiple audiences. Ms. Robinson reminded the group that at the last ORRHES meeting, she presented a sample communication education plan and how that was going to be informed by the community assessments. In presenting that plan, staff said that they could take some action now to begin improving the information delivered around the different health studies. Thus, the web site redesign is one of the actions that staff was discussing at that meeting. Ms. Robinson stated that the ORRHES might recognize the list of audience members



from the sample plan. She reiterated that the plan was not a completed plan, but it was something with which they could begin to organize the communication.

In that plan the multiple audiences included:

- ORRHES Members
  
- Interested Community Members
  - Technical and non-technical
  - Within specific PHA area—outside of the PHA area
  
- Interested Groups
  - Civic and environmental groups
  - Government agencies
  - Public health councils
  - Elected officials
  - Hospitals, private practitioners (Medical personnel are especially encouraged to submit specifics regarding what they would like to see on the website.)
  - Schools (added)
  
- Media
  - Oak Ridge, Regional media

Ms. Robinson shared a flow chart of the standard process for developing a web site. She explained that in the top, left-hand box was the first step, which is documenting the information needs. The team has received a great deal of input from the ORRHES which they have inputted into the web site's prime user scenarios. Then, the work that Dr. Sterling's group is doing with the community assessment will obtain more information about potential users of the site. Once all of that information is obtained, then the team will develop a creative brief. Ms. Robinson indicated that she had a draft of the creative brief with her, which she would share with the group later during her presentation. A creative brief assists developers with keeping on strategy to develop a product, which in this case is the Web site. She indicated that she would walk through that draft creative brief later, and she was looking forward to the group's feedback on it.

Because a web site is an interactive medium, the team had to develop what is called "user scenarios." Individual scenarios are developed for different types of users. A scenario helps the developer to understand what information the user wants and what they might do with the information that they receive from the web site. For example, some people might want to download the information and give it to people, so those users would want the information on the web site to be in a format that they can use and carry with them. After the team knows what the users like and what they want to do with the information, then the developers have to inventory the content to make sure it meets the needs that have been identified. The content will then be matched up with the information that has been received on different users.

Next, the team will revise the web site structure, develop a prototype or a “mock up” of the new web site, and launch it. Ms. Robinson stated that she had not done the “mock up” yet, but all of the steps up to the “mock up” had been done. Although she did not have the mock up completed, she had done some pages just to give the group a feel for how it might look. Once the prototype is completed, she plans to send the ORRHES an e-mail, so that they can review the new version. She asked those in the group who were very interested in the Internet to let her know, because it would be nice if they could work with the team in the interim. Finally, the Web site is revised, based on feedback and then it is launched. The team is planning to launch the new web site in June.

With regard to content development, a web site is developed like an onion is peeled. First, the major activities are done and then one keeps peeling. Not everything will be completed when the web site first comes up, but things will continually be added. Ms. Robinson then walked the group through the creative brief. She invited the group to present their comments to her as she walked them through the sections, rather than wait until the end of her presentation. She added that they could also e-mail changes or additions to her or to Ms. Horton. First came the audiences, which she already mentioned. Next came the goals and objectives of the web site, which were as follows:

- Assist the ORR community in understanding the findings of the PHAs;
- Build capacity within the ORR community to respond to issues related to release of PHAs;
- Increase interest and participation by ORRHES members and interested individuals in providing input on PHAs; and
- Collect the address the community’s needs and concerns related to PHAs and their health.

Ms. Robinson stressed that she really wanted the group’s input into the goals and objectives for the web site. She said that all of the goals and objectives suggested features that the ORRHES might want on the web site. The last objective suggested that they might want an open-ended comment box. For example, a PHA could be put up, and they could ask for comments on it.

Just as important as creating something is thinking about what is going to get in the way of creating it. Obstacles to the web site include:

- Community members may not have access to the web site. There are a lot of technical details to consider, such as low bandwidth access.
- Community members may not trust the information
- Depth and complexity of the information presented will pose readability and usability challenges because of the web medium. It is not like a printed newspaper, and obviously having a printed PHA is much easier than trying to deal with it on the Web.
- Internal CDC/ATSDR standards may constrain design to meet the needs of users. She stated that she would discuss the template that they were going to use. It is a much more powerful template that the CDC has developed, but it will constrain some of things that the ORRHES wants to do.
- Clearance at CDC/ATSDR may slow down the creation of needed content.
- Clearance and posting process barriers may slow timely updates.

- Funding for external support for web enhancements may be limited.

The key promise is what helps developers stay on target with the web site development. The ORRHES Web site's key promise is as follows:

“By using this web site, I will have a better understanding of ATSDR's public health activities in the areas surrounding the ORR. This includes public health processes and what different findings from assessments and other studies mean. I will be able to answer my own questions and the questions of others regarding what is known about the health effects from the Oak Ridge site.”

Ms. Robinson explained that the next part of the creative brief was the support statements or the reasons why the key promise would outweigh the obstacles and why what is being promised or promoted is beneficial:

- The Oak Ridge web site will be a one-stop source for public health information regarding the areas surrounding the ORR.
- The Oak Ridge web site will provide a collection of resources and tools that will help ORRHES members, residents, and other interested groups to understand, evaluate, and respond to ATSDR's public health activities.
- The Oak Ridge web site will provide ORRHES members and Oak Ridge residents with up-to-date information disseminated in a timely manner.

Ms. Robinson pointed out that she thought she had addressed usability, which addressed Ms. Kaplan's concern. The next section is the tone of the web site, which also addressed Ms. Kaplan's concern about usability. Tone describes what the web site will feel like.

“The tone [of the Oak Ridge Web site] will be informative, sensitive to community concerns, accessible, and capable of keeping users' interest. The text will present a public health 'voice' that provides reliable (objective) information that is, at the same time, inviting and user-friendly. The links will be in plain language, easy-to-navigate, and accessible to multiple audiences (e.g., lay or professional).”

Ms. Robinson said they would add a statement about usability into this section. She then shared what is called the “Openings.” The team needed to look at openings for when the web site might be used, because that might assist the team in thinking about what should be presented to the users first. So, this is thinking about the mental model of how they are approaching the web site information. The openings answer the question of what the potential users might be looking for when they come to the ORRHES Web site. Some openings are:

- When looking for general information about ORR public health activities, including PHAs, community needs assessments, NCEH, ATSDR, and ORRHES activities.
- When looking for specific information about a contaminant of concern or other issue related to public activities in the ORR area.

- When specifically looking for information about ORRHES, including background information (i.e, purpose and functions, minutes of the past meetings, scheduled future meetings).
- When looking for health educational resources to share with interested parties related to public health activities in the ORR area.

Ms. Robinson continued to explain that the last issue was creative considerations, by which the web site has to abide. Some of these are:

- The use the CDC/ATSDR standards and guidelines for publishing material on the Internet, including fonts, photographs, and graphics.
- CDC meta-tagging standards need to be used as time allows. This will address the indexing questions.
- Coordinate with the Office of Communication for review and approvals.

Ms. Robinson then explained how user scenarios were developed. She also thanked Wilma López who worked hard on the user scenarios that she was going to present. Essentially, the way one develops a user scenario is to analyze how people might use the site and identify the potential user groups, which are listed in the creative brief. Then one uses data to create a user scenario. The team essentially analyzed the web site issues expressed by the community members that Mr. Hanley has compiled. They also analyzed some of the materials in the HAZDAT Database that are used at other sites, so that they could understand the demand for information from other Superfund or Federal sites. Then the team also happened to have, in house, a DELPHI Panel Report on what health care professionals want in a web site related to toxic substances. So, the team used that knowledge to create some of the profiles for health care professionals. Some additional data gathering would be good as the team continues to develop the site, including some interviews with ORRHES team members that represent the top users. For example, Ms. Kaplan would be a good one to interview with regard to what an ORRHES member would be looking for, and Dr. Malmquist would be a good representative of physicians. She suggested that if anyone in the room wanted to be a champion for a particular user group, they should talk to her.

Other data sources include focus group results from the needs assessment that will be conducted, and looking at the community concerns database reports. The team first had to think about the general information needs that would be similar across all of the audiences and how that content would be used, what content that we had to meet those needs, and where that data might be obtained. First she shared the team's "blue sky" page, which listed the team's thoughts about everything that could go on the web site. Then she shared several user scenarios.

The first was a community member: Sandra is a high school teacher who has been living in the ORR for about ten years. She saw an article in the newspaper about the ATSDR public health activities in the area, and she wants to find out what the contaminants of concern are in her area and her adverse health effects. She thinks that she might want to prepare a current affairs discussion topic on that for her students. So, she Google's<sup>®</sup> the terms ATSDR and Oak Ridge. She notices the link to the ORRHES web site, clicks on it, and she reads a brief history of the public health activities at the site and notices that there is an update on all activities on the site,

which is one of the suggested features of the new site. Because she wants details on all activities, she clicks on that. She receives a fact sheet on all the PHAs, plus links to more information discussing the contaminants of concern and the timeline for the PHA. She selects Y-12 because it is in her area. The Y-12 pages include links to a summary, a map of the area, fact sheets, health education materials, and frequently asked questions (FAQs). She downloads the full PHA to read later.

Next, Ms. Robinson showed the group a “mock up” of what the site might look like. She emphasized that this look was not finalized, but it would give them a sense of how it might look. The team plans to use the new architecture in which the CDC has invested so heavily. The new architecture attempts to put content on the first page that people will come to, and so the first page could include, on the left-hand side, a picture, and then some text to draw people into the site. The architecture also has features with which to lump together the different types of information one might have on a particular topic, such as fact sheets, Q and As, reports and presentations. On right hand side are some menu selections. Current usability studies show that one should put the menu bar on right side because of the scrolling. That way, the user’s eye does not have to travel across the page. So, the new site has a menu bar on the right side. The topic content for this new site would include: Home, Public Health Activities, Public Participation, perhaps a section for community resources, and then the ORRHES would have its own link and page.

In the aspects area on the new architecture, is an area for events. That is where the calendar would go. Ms. Robinson indicated that she had sent an e-mail to the IT department informing them that the ORRHES would like to keep the calendar that is currently on the site, but that function is not built out yet. Then there would be links to other programs that might think are allied with the ORRHES efforts. As an example, Ms. Robinson had included the DOE High School program, since she had met Dr. Joseph at the last meeting. Links to other Federal or state agencies would also go in that area.

Based on a philosophy related to the different literacy of the audiences, as the user goes down the page, the information will become more complex. For example, on CDC’s web site, in the SARS section, one would see the basic information first, and then the clinical and more technical information would be found at the bottom of the page. The team can program this section called “selected resources” to highlight the things that the ORRHES thinks are the most relevant at any given time. For example, the section could include things like: Update on All Activities for Spring 2004, FAQs, Information for Health Professionals, Exposure Fact Sheets. These can be mixed and matched with the most requested items. The Web site also includes space for:

- Education and training information such as case studies, environmental medicine, taking exposure history
- News and press releases
- Repeat of resources

Ms. Robinson shared what the PHA overview page might look like. This page would give some content right up front and then it could have a section for the PHAs, with a link to each assessment. She demonstrated what would occur when someone went to the page, using a Y-12

PHA mock up. Information on the PHA would include links to all of the resources available for that PHA, beginning with the most simple and ending with the most technical. So, the section would lead the user from FAQs, short briefings, and the summary to the full report and presentations, and then to the training resources related to Y-12, and finally the news and press for Y-12. This architecture had been usability tested with consumers, and it works.

**Discussion Points:**

- ◆ Mr. Lewis liked the concept of concerns, because most of the public looks to see if their concerns have been heard. If there is a complete listing of their concerns, and they read them, then they have some confidence that even if they do not understand the technical requirements, at least their concerns have been addressed. He thought it was an excellent idea. Ms. Robinson responded that what was interesting about that collection is that addressing concerns is another thing altogether. She was not sure that they would want to put the raw comments up. She needed to ask that question. However, they needed to be extremely careful of privacy. Nonetheless, it could be an extremely nice mechanism in that regard.
- ◆ Dr. Malinauskas added one more obstacle, which was the educational diversity of the intended audience. It needs to be kept simple. If the site is too technical, it is not going to be read by anybody. Ms. Robinson agreed that it was important to note because they could actually have a strategy to try to address that obstacle.
- ◆ Ms. Kaplan said she was having a problem with the key promise, because if someone is going to have understanding of something, then that implies that someone is going to read it and understand it. However, the web site should also be useable, and one of the problems with the current web site is that it is not useable. Ms. Robinson suggested that perhaps they should amend the key promise to include a statement that says that the web site will be easy to use. She indicated that they would work on the wordsmithing later.
- ◆ Mr. Lewis suggested that the web site be user-friendly for the type of audiences that Dr. Malinauskas discussed. Ms. Robinson agreed that there should be something for everybody, no matter who they are. She said they would make that revision and send out another draft.
- ◆ Mr. Box said he had a feeling that the average computer user in the ORR nine-county area is really not familiar with this web site. He thought that the ORRHES needed to announce the new web site in the newspapers and advertise in other ways, so that the community would know it exists. Ms. Robinson suggested that they add that as an obstacle: ORR community members may not know about the web site. Mr. Box clarified that their audience should include not only ORR but also the entire nine-county area. Ms. Robinson agreed that people in the nine-county area might not know about the web site. She said it sounded like he was also recommending that the team put together a promotion plan. Mr. Box responded that it did not have to be a major effort, but it should be something that peaks their interest, something that would appear in the newspapers of the area to let people know that the web

site is available and that they can find out more information about health effect efforts in the ORR area.

- ◆ Ms. Robinson explained that when a web site is first launched, often there is what is called a “soft launch,” because the site will have glitches that will have to be corrected. So, the team would probably not promote the site widely until after it was up and running well for awhile.
- ◆ Mr. Lewis thought that people were interested in health issues and concerns and not necessarily exposures. Ms. Robinson responded that they would figure out how to fit into the programming the idea that health issues are key for lay people.
- ◆ Dr. Peter Malmquist noted that in the support statements, the team includes the broad, general statement that the web site would be a “one-stop source for public health information regarding the areas surrounding the ORR.” It cannot really say that because what people are looking for is public health related to the ORR Superfund site and not public health per se, as a broad category. If the ORRHES is going to say they are going to be a “one-stop source for public health,” then is the site going to include information about diabetes and other public health issues? Ms. Robinson indicated that meant related to the ORR. Dr. Malmquist suggested that should be specifically stated, that the Web site was regarding the area surrounding ORR. They are concerned with the nine-county area, and there are different areas of concerns in public health that this web site will not address. If one looks at prior concerns in most of the outlying counties, they are not related to the possible contamination from Oak Ridge. Ms. Robinson agreed with Dr. Malmquist and indicated that the team would reword that point.
- ◆ Ms. Robinson indicated that all the language would be corrected based on the group’s feedback. She added that Mr. Lewis’s comment needed to be added to the openings, which was: When looking for information about health issues, that is a key one.
- ◆ Mr. David Johnson commented that he was not hearing partnerships as they relate to the medical field. Even though the site focuses on the ORR area, there are still other illnesses and diseases that impact the ORR community specifically, such as diabetes, obesity, et cetera. He suggested that the team look “outside of the box” to include some of those other ORR community concerns. Ms. Robinson asked if his suggestion was to consider a section of links to other health issues information, perhaps linking to the National Library of Medicine and so forth. Mr. Johnson responded that was exactly what he was talking about. Ms. Robinson thought they might already have that in their detailed user profiles, where the team thinks people are going to look for general health information.
- ◆ Dr. Malinauskas commented that he had a concern about “awareness of the web site.” He knew that there was intent to make the public media aware of the site, but he did not think that would be sufficient unless they propose to use the site as the lead headline of their newspapers, and that was not going to happen. He thought that they needed to look for a more saturated approach. For example, presentations to local civic organizations, chambers of commerce, rotary clubs, Lions, Kiwanis, putting posters in appropriate libraries, putting announcements in post offices. The community should be saturated with fan awareness of

this web site. Ms. Robinson responded that he was referring to a promotion plan that would saturate the community with awareness of the web site. She asked the group if they understood that the web site would be launched first, without being promoted. The promotion plan would be implemented after the bugs were worked out of the site.

- ◆ Dr. Craig thought that the chambers of commerce and local real estate organizations would love to have this information, so that they could guide people to it for information if they have concerns about the area.
- ◆ Ms. Kaplan asked if the ORR Web site show up in Google<sup>®</sup>. Ms. Robinson explained that different search engines use different algorithms for how the results are returned, especially commercial search engines. For example, in Yahoo<sup>®</sup>, someone can purchase their way up the food chain in search results. Google<sup>®</sup> uses quite a complex formula related to how many people are linking to a site. It is difficult to move a site's position in Google<sup>®</sup>, unless it is just a popular site. That is why people like it, because they know it is not being manipulated. That said, if some search terms are typed in, the ORRHES site does pop up very quickly.
- ◆ Mr. Box reiterated that the area needed to be saturated with the web site information. There is a large number of people in the area who would like to know something, but who are not really doing a search. However, if they are made aware of the site, they will go there directly. If the web site is publicized, it will reach a much larger number of people who have concerns, but who will not know how to use search engines to find the web site. Ms. Robinson responded that she thought he was saying that they might need to think through helping people find the web site, so that they will know where it is. If they cannot manipulate the search engines, then they should think about having an easy-to-read URL and think about other ways to get people to the site or getting other people to link to the site.
- ◆ Mr. Hill explained that when he wanted information, he simply goes to Google<sup>®</sup> or Yahoo<sup>®</sup> and types some terms in to the search window. Although he does not understand how the search engines work exactly, he does understand that they cannot manipulate them like they would like to. However, he did not hear, in Ms. Robinson's presentation using the actual terms. Everyone said "nine counties," but they did not name the counties. The group talked about ORR but did not name ORNL, K-25, ETP, Y-12, et cetera. He wondered if he was out of state doing a search on Kingston, Roane County, located close to Oak Ridge National Laboratory, if he puts those words into the search engine, if it would find the web site. Ms. Robinson replied that she was hearing his concern, and they could put metadata in the pages in that assists with that. The way a web page works is just like a text file, and inside some brackets are things that do not show up when the browser pulls it up. So, the team could put a lot of those terms in, and that would help the search engines find it. There are some technical ways that the team can improve the search results. Ultimately, they sometimes cannot change the position, but she was hearing that this was a chief concern. Also, she asked if the group would help the team with a creative way of ensuring that they list these things, such as the counties, in the creative brief. If no one sees the team talking about something, they need to bring that issue up.



- ◆ Dr. Craig thought that it would help with Google<sup>®</sup> if they could get up to 50 or 60 web sites that are linked to the ORR web site. He thought that it would pop up quite quickly. He also suggested that links could be created easily by sending out e-mails with the new site's URL to the chambers of commerce, to UT Battelle, to Y-12, to all the counties, to the City of Oak Ridge. He thought that they would all love to link to the ORRHES site. Ms. Robinson agreed. She also thought that putting the metadata into the page would help some, too. Dr. Craig pointed out that Google<sup>®</sup> has gotten wise to that. Ms. Robinson knew that, and said that it was one of the reasons that everyone liked Google<sup>®</sup> so much. It could not be easily manipulated.
- ◆ Ms. Robinson summarized that one of the main concerns was that people had to be able to find the site and they should be able to find it through the search engines. She added that the team would be working on getting the web site up first, and then they would work on making it easier to find.
- ◆ Mr. Hill suggested that somewhere up front, the site should have links to the three sites, the DOE Oak Ridge Operations, and then DOE Headquarters, because those open up a lot of things that area not related to what the ORRHES is doing, but people would be interested in those efforts. Dr. Craig reiterated the need to have a myriad of links, and the ORRHES should offer to exchange links. Ms. Robinson asked if those DOE links were currently on the ORRHES site. Dr. Craig was not sure, but they did need to add cities, civic groups, and the chambers of commerce.
- ◆ Ms. Robinson asked the group to please send any ideas to her. She added that anything that is currently on the site would not be lost and would be integrated into the new site.
- ◆ Dr. Malinauskas thought that it would be quite helpful if, in parentheses, they would put the number of pages involved in any reports that are on the site, because he would hate to try to download a full report and find out later that it is 205 pages. Dr. Craig suggested that even just the number of megabytes would be helpful.
- ◆ Ms. Janet Michelle suggested that if they wanted a member of the community group to make comments, she would be happy to be that community representative. She is a member of the Community Coalition for a Healthy Environment.
- ◆ Ms. Kaplan commented that she spent the weekend using the old ORRHES site when preparing her earlier comments, and so she felt close to the site as it currently exists. As it exists, if an ORRHES member wants to go in and do a search on a particular subject, and they want to go through all of the ORRHES meeting minutes and the Work Group minutes, the only thing that is searchable are the ORRHES meeting minutes. They can go in and there is a version choice. If they pull up the .PDF version, then there is a find feature. Someone could search it, but could not copy sections. She spent all weekend typing the timeline. It was a waste of her time from that standpoint. The other thing they get is a list of hits. The page on their own hit and the page that prints out do not match. She will write down her specific comments and send them to the team, but she reiterated that people should be able to get a printed search product. Also, it would be nice to have a map that was searchable by

area or by county, so that people could click on it for information on the possible contaminants to which they might have been exposed. The link should also explain the possible health risks and what is known about the impact of the contaminants on their bodies. Ms. Robinson responded that some of these issues have been worked on with the cdc.gov site for years, but others, like the map, should be doable.

- ◆ Mr. Lewis suggested that the map might even go down to the community level, because the ORRHES has heard, from certain people who live in the Happy Valley area, that they have issues related to their health. It would be nice if people in the individual communities could look for their particular concerns. He pointed out that he was advocating for the major communities and not every single block.
- ◆ Ms. Robinson suggested that the team have a working session with the ORRHES members who are interested in organizing information in that way. Then the team could look at how to pull the documents in that way. Then, if it was a matter of resources, it may be something that the ORRHES could assist with, but that is doable.
- ◆ Mr. Lewis thanked Ms. Robinson for her excellent presentation. He added that the ORRHES is a part of it and he wanted that noted. He thought that would be very helpful.

Hearing no further comments, Ms. Susan thanked the subcommittee for their time, and she asked that anyone who had any further comments, questions, or suggestions to please contact either her or Ms. Horton.

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### **Introductory Presentation of Past Releases of Mercury from the Y-12 Plant**

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*Mr. Bill Taylor*  
*ATSDR Oak Ridge Field Office*

Mr. Bill Taylor's presentation covered the following:

- Mercury Presentations at ORRHES ("Big Picture")
- Data Sources for the Y-12 Mercury Releases PHA
- Mercury Exposure Pathways
- Mercury Concentrations in Environmental Media

Mr. Taylor explained that mercury is one of the nine PHAs that the ATSDR is producing for Y-12, and like many of the PHAs, this PHA is divided into past and current exposures. The past exposures are for the years 1950 through 1990. Presented would be 1990 to the present. The reason for this division is because ATSDR is relying on the Oak Ridge Dose Reconstruction Project for past information, and is relying primarily on those reports for the analysis of past exposures.

Directing the group's attention to page 2, the middle row, looking from the left to the right, Mr. Taylor explained that he was, first of all, considering the data sources that ATSDR is utilizing for this PHA. From the releases of mercury from Y-12, ATSDR developed and estimated

concentrations of mercury in the environmental media, which includes air, water, soil, biota, and fish. From that, the human doses are calculated. Also considered are the health implications of those human doses, along with health outcome data available. Finally, conclusions and recommendations are reached and a public health action plan is developed for the public health assessment. All of this is accomplished along with community concerns that have been collected.

With respect to the mercury releases up to the point of environmental media and concentrations, Mr. Taylor said it was important to note that what starts at the left in the process, impacts each step of the process. So, what is learned about the mercury concentrations in environmental media will have an impact at the very end of the process. Therefore, it is important to know what the strengths and the weaknesses are on this data at this stage. The data sources being considered for this project are:

- ❑ The Oak Ridge Dose Reconstruction Task 2 Report, from 1999.
- ❑ Comments by technical reviewers on the Oak Ridge Dose Reconstruction Task 2 Report. These are technical reviewers that ATSDR contracted, who gave the ATSDR comments. Those comments have been compiled into a report, and that report was distributed to the PHAWG late last year. He instructed the ORRHES that if anyone was interested in receiving a copy of that, they could contact him. The five technical reviewers were hired to study the Oak Ridge Dose Reconstruction Task 2 Report and to give us their professional opinions of what they saw, according to standard questions provided to them to address.
- ❑ Questions, comments, and concerns from ORRHES and the public, which include:
  - Received one unpublished scientific paper containing environmental data
  - Concerns about waste pits and burial sites
  - Concerns about unauthorized releases
  - Concerns for contamination in specific soils and groundwater that has not been tested
  - Concerns about the full effects of the complicated terrain in the ORR area

As ATSDR receives more concerns, they will be incorporated into the report as well. Mr. Taylor emphasized that if anyone in the group knew of anything that was not on the above list, ATSDR is interested in seeing it.

At the beginning of the process, ATSDR wanted to consider how much mercury came into the plant and how much mercury ATSDR knows went out of the plant. Mr. Taylor shared a condensed table from the Dose Reconstruction Task 2 Report. The numbers in the table were generated in a study done in 1983 that was not specifically for the dose reconstruction, but was reproduced on the Dose Reconstruction Task 2 Report. The amount of mercury vouchered to Y-12, in pounds of mercury, is estimated to have been over 24 million pounds. Of that total, the amount that was accounted for that went into production and was resold at a later time was over 22 million pounds, and the difference was approximately 2 million pounds. What is known about those 2 million pounds? Looking at the releases, they have estimated the amount lost to

the air, soil, and water is approximately 733 thousand pounds, which leaves a difference of 1.2 million pounds of mercury that is not accounted for.

With regard to the importance of these numbers, Mr. Taylor said that first, the unaccounted amount of mercury is the amount that is going into the air, water, and soil. Also, the amount that is really unknown is more than half again larger. This is an amount that is difficult to deal with because where it went is unknown. There is some speculation that is discussed in the report that says that this may have been an accounting error, that it was part of the way that they counted mercury coming into the plant. The people they interviewed estimated that this might have accounted for approximately half of this number. Even so, that leaves an amount half again the size of what is known is unaccounted for. Those numbers provide some uncertainty about the pathways being considered, particularly the air and water pathways. The numbers do not particularly impact the soil and the fish pathways because those were estimated based on actual measurements in the environment rather than modeled amounts that were released from the site.

Primary exposure pathways include: Surface water, air, soil and sediment, and fish. Secondary exposure pathways are: Fruits and vegetables and milk and meat. These are secondary in the sense that they are derived from concentrations in mercury that were estimated in the surface water, air, and soil. After they decided what these might have been in the past years, they also modeled how they could have affected the concentrations of mercury in the fruits, vegetables, milk, and meat. The additional exposure pathways that the ATSDR is going to be considering as a part of this public health assessment were chosen based on the concerns of the technical reviewers, members of ORRHES, or members of the public in meetings Mr. Taylor has attended over the past year. These additional exposure pathways include:

- Inhalation of mercury tracked into homes on shoes, primarily from soils, but possibly even from workers bringing it home on their boots.
- Contaminated soils transported from East Fork Poplar Creek to gardens. ATSDR knows that there were some soils and sediments that have been moved around from East Fork Poplar Creek.
- Ingestion of or skin contact to mercury of children digging in soils below the surface level.
- Air dispersion or mercury from East Fork Poplar Creek in the K-25 cooling towers.

Additional exposure pathways will be considered as they come to ATSDR's attention. Mr. Taylor then discussed, in more detail, the four primary environmental media types and discussed what ATSDR knows about how mercury concentrations were developed by the people who developed the Oak Ridge Dose Reconstruction Task 2 Report. He explained that the reference populations for water include:

- Scarboro Community (Mile 14)
- Robertsville School Students (Mile 12)
- East Fork Poplar Creek floodplain farm family (Mile 10)

The types of exposures ATSDR is considering are incidental ingestion of the water and skin contact. Those are the primary ways in which people would come in contact with the surface water. The locations that were considered of interest for Mercury concentrations in the water

that the dose reconstructionists looked at for these specific communities were at mile 14, mile 12 and mile 10, along East Fork Poplar Creek. Those locations correspond to the nearest parts of East Fork Poplar Creek to those particular communities. The data ATSDR currently has for water include spot samples from 1955 through 1961 from the East Fork Poplar Creek, near Y-12 and at the opposite end of East Fork Poplar Creek, near Poplar Creek. This data is very useful because it is direct data that can be used to estimate what the concentrations were in the water in the past. They provide a measure of the total change in mercury in the water over the full length of the East Fork Poplar Creek. The assumptions that went in to the modeling were that:

1. Changes in mercury concentration in EFPC between Y-12 and Poplar Creek are due to:
  - Surface water runoff to EFPC
  - Loss of mercury from water to sediment and air
  - Discharges to EFPC from OR waste water treatment facility (beginning in 1958)
2. Amount of surface water runoff along and into EFPC was estimated in the study by the Tennessee Valley Authority, in 1985. Using this information, along with annual precipitation data, the Task 2 dose reconstructionists were able to determine the factors that provided dilution of water to the creek over its entire length.
3. Loss of mercury to sediment and air that was considered to be linear along the length of the creek, which means that the rate of loss does not vary. This loss was calculated by the Task 2 dose reconstructionists as the difference between the changes in the water mercury concentration from Y-12 to Poplar Creek and the effect from dilution. This was a basic description of the model that was used to estimate what the mercury concentrations were at the three locations along the creek that corresponded to the receptor populations.

The results of their calculations were:

- Surface water mercury concentrations at receptor locations (for each year, from 1950 to 1961) were calculated from:
  - The measured concentrations at Y-12,
  - Reduced by a dilution factor (from the drainage basin) and
  - The fractional loss to sediment and air as estimated by a calculation subtracting out the effect of dilution.

Through this model, dose reconstructionists were able to provide the estimates of the water mercury concentrations that did not rely entirely on releases to the water. The strengths of their results are:

- The model is reasonable
- Numerous data were used that correspond to the 1950s and the early 1960s, as well as precipitation data for the years of interest

- ❑ The value selected for loss to sediment and air, which is 70% along the fullest extent of East Fork Poplar Creek; this value was supported by a separate study

The weaknesses of the data include:

- ❑ In the early years, the model broke down. What happened was, when they took into consideration dilution, the resulting concentration was greater in the creek than was predicted and was not allowing for any reduction due to precipitation or fallout of mercury into the sediment or volatilization to the air.
- ❑ The uncertainty in the amount that was lost to sediment and air was a very large number. This basically says that that along the full length of the creek, somewhere between 40% and 100% of the mercury went into the sediment and the air. That is a large amount of uncertainty.
- ❑ The assumption that the linear loss of mercury to sediment and air is problematic, because it is known that mercury and sediment was not deposited linearly along the bed of the creek. ATSDR has examples, particularly near two of the receptor populations of Scarboro and the Robertsville School, where mercury in the sediment was actually quite high. The relationship between mercury fallout in the sediment and the water concentrations is not entirely clear.

Mr. Taylor explained that there were three different models and a series of different reference populations for air, including:

- ❑ Wolf Valley, where mercury concentrations in air were estimated from releases from the Y-12 plant, using an air dispersion model.
- ❑ At the Scarboro community, with releases from the Y-12 plant and a model based on uranium data
- ❑ Releases of mercury from volatilization from the creek water from EFPC, which would have affected Scarboro, Robertsville School, two different locations in Oak Ridge that were modeled, and EFPC Floodplain farm family.

These were three different models that they used for different reasons, to calculate mercury concentrations in air. The first model, with Wolf Valley, was the simplest model. Mr. Taylor referred the group to the first of the figures. The diagram shows, graphically, what source terms are. Mr. Taylor pointed out the numbered items in the diagram are the stacks, vents, and window fans on the Y-12 buildings. For each of these locations, it calculated for each of the years how much mercury came out of these locations and into the air. When all of these locations were combined, the total was the amount of mercury that went into the air from the Y-12 for any particular year.

Each of these was plugged into the EPA dispersion model that was then used to calculate mercury concentrations in air at the Wolf Valley location. The dispersion model was appropriate for this task because the model that was used is for relatively flat locations, and Wolf Valley is down wind in the valley direction from Y-12. There were 114 point source terms at Y-12. These are the points on the diagram, and they included the stacks, window fans, and vents. The total uncertainty estimated by Task 2 for these air concentrations, was +/- 44% percent of the concentrations. The method and the results are likely very reasonable for this calculation.

The second model for air was in the Scarboro Community, and because the air would be going up and over Pine Ridge, the flat-air dispersion model was not appropriate to use. So, they went to a model that is referred to as the "Chi-over-Q" method. Chi is a Greek letter that looks like a capital X. The Chi-over-Q method assumed that mercury behaved like uranium. ATSDR had data from 1986 to 1995 that indicated how much uranium concentrations were in Scarboro during this ten-year period and what uranium releases from Y-12 occurred during the same ten-year period. From those data, a ratio of these quantities can be calculated, and if one believes that mercury behaves like uranium, one can use releases of mercury from Y-12, which was known during the 1950s and the 1960s. So, the estimate the mercury concentrations in Scarboro were based on this ratio of uranium data. The value of Chi-over-Q, which is uranium concentrations over uranium releases from Y-12, is calculated from twenty pairs of data where the uranium releases were relatively low compared to the 1950s and 1960s. The weaknesses of this particular model are:

- There is no direct evidence that mercury behaves like uranium.
- There is no evidence that the relation holds for much higher release levels of mercury.

Thus, it is questionable whether this uranium model is a good choice for estimating mercury concentrations in Scarboro. But, this model was the choice of Task 2, as the best way to go with this problem.

Mr. Taylor explained that the third model was air mercury concentrations in communities affected from mercury volatilization from EFPC water. It was estimated that amounts of mercury going over Pine Ridge from direct releases from Y-12 did not account for the amount of mercury that they were finding in tree samples, in the cores of trees. In looking over the studies of the trees, they estimated that a source of mercury was directly out of the water of the creek itself. They modeled this and for this purpose, they estimated 403 theoretical segments of EFPC. Mr. Taylor referred the group to the second diagram on his handout, which was a visualization of what the creek looks like when it is divided into segments. Each of these segments is no longer than 100 meters, and each of the segments provides a source term of the amount of mercury going out of water and into the air. From that point, the same model the EPA dispersion model was used to estimate the amount of mercury concentration in air at the receptor locations. So, it was a dispersion model using the creek itself as the source term for mercury going into the air.

The amount of mercury going into the air was estimated based on the distance of each of the segments from Y-12 and the rate of volatilization from the water. The rate of volatilization was estimated in a couple of specific studies that were conducted on Reality Lake in EFPC and in the

laboratory. The numbers they arrived at were somewhere between 1% and 30% of the mercury in the water would volatilize, with the central number being 5%. This figure was applied to the mass of mercury in each of the theoretical segments along the EFPC. Again, the amount of mercury mass was assumed to be linear with distance from Y-12. The receptor populations and locations along EFPC were the same as for water exposures. The data sources were:

<i>Environmental Pathway</i>	<i>EFPC Farm Family</i>	<i>Robertsville School</i>	<i>Scarboro Community</i>
Soil	SAIC RI	SAIC RI	ORAU
Sediment	SAIC RI	SAIC RI	SAIC RI

Studies looked at the soils and sediment from the SAIC remedial investigation study, and soils from Scarboro and an ORAU study. The SAIC Remedial Investigation study included:

- 159 transects of EFPC, which are theoretical lines that cross through the creek, where samples were actually taken.
- The core samples taken were in units of 0-16, 16-32, and 32-48 inches. These were homogenized, so that there were three sets of data for each of the core samples.

Task 2 calculated fish concentrations in a couple of different ways for different receptor populations and locations, including:

- Scarboro residents (fish from EFPC)
- EFPC floodplain farm family (fish from EFPC)
- Anglers at EFPC
- Anglers at Poplar Creek/Clinch River
- Anglers at Watts Bar Reservoir

Past fish mercury concentrations were calculated from sediment mercury concentrations. They found that there was a good match when an analysis was done among the data that they had in the 1970s and 1980s for the amount of mercury in sediment and the amount of mercury in bluegill and largemouth bass. With a linear regression analysis to match the concentrations in the sediment and in certain fish species, they were able to apply this correlation to the sediment samples that they took to look at historic years. Those 6 core samples were taken from the EFPC, Poplar Creek, Clinch River, and the Tennessee River. Core samples were dated using both mercury and cesium-137 stratification. This model demonstrates that there were many core samples done as a part of this study to look at the amount of mercury in the soils and the sediment along EFPC. In order to date them, there was a specific, special study called the Vertical Integration Study, where 18-inch cores were divided up into 1-inch segments. It was estimated from the study of these five core samples how the soil concentrations varied along the depth of the core. This particular distribution of mercury through the depth was normalized and applied across the board to the samples where the amounts were homogenized to estimate the amounts of mercury at different levels and therefore for different years throughout the EFPC flood plain. The samples that were selected in the floodplain for the three receptor populations were then selected as those samples that were closest to those mile markers.



The SAIC study was an elaborate study, and much real data were used. ATSDR is using it directly to estimate how much mercury was in the soils and the sediment from, 1950 through 1990. One of the weaknesses of this model is that if there were significant amounts of mercury that fell below sixteen inches, which was the core sample that was used to make the estimates, then the amount of mercury for that particular year could have been underestimated:

- Regression equations were a good use of recent data from the 1970s and 1980s.
- Cesium dating increased the reliability of the sediment dating
- There were too few core samples (6) used for the entire surface water from Y-12 all the way down to Watts Bar Dam:
  - There was only one each in EFPC and Poplar Creek. This is quite difficult to accept given that we know that the sediment concentrations through EFPC vary a great deal
  - The high variation in sediment mercury is not accounted for in the model. There is one estimate at the Y-12 end and EFPC, and another estimate at the Poplar Creek end of EFPC. Those two core estimates of mercury concentrations for the 1950s and 1960s are based on averages of those two cores alone.

Mr. Taylor explained that SAIC sediment data was not used, and at the lower end of EFPC they assumed 20% of New Hope Pond. There was no core sample taken. There was a surface sediment sample that was compared with the surface sample at New Hope Pond, at the Y-12 end, and the difference in the mercury concentrations in that sediment at the surface showed the difference to be 20% (1985 data). In other words, the mercury at the low end of the creek was 20% lower. Therefore, one has to assume that for all of the years, the concentrations and sediment at the low end of EFPC were all 20% of the amount at the Y-12 end of EFPC. This is also quite a stretch because it is based on few data. The EFPC and Poplar Creek sediment mercury concentrations exceeded those in 1980s data. These were the data that were used for the linear regression analysis. They began to extrapolate the linear regression for the sediment samples that were higher in mercury concentration. They put aside their model altogether and assumed maximum mercury concentration from fish based on a study that was done in the Great Lakes.

Again, correlation was based on data where the sediment mercury concentrations were relatively low in the 1980s compared to the 1950s. Once the sediment samples for the 1950s were estimated from their core samples and found to be in excess of the linear regression model, they put the linear regression model aside, took default values of maximum mercury concentrations in fish from the Great Lakes study. This was another point that was criticized by ATSDR's technical reviewers for a couple of reasons. First, the rejection of the linear regression was not fully justified. Second, even though the Great Lakes study included the same fish species and sizes of fish that are found in EFPC, the amount of mercury in the sediment in the Great Lakes study was half of that maximum that was found in certain areas of the EFPC. So, it appears that the maximum value in fish from the Great Lakes study may not be a good default value for the maximum concentration from mercury in fish from EFPC.

In summary, Mr. Taylor presented the following conclusions:

For surface water, accounting for runoff supports the variation in the dilution of the water at different locations. This comes from the TVA study and it is real, measured data. Averaging of losses of mercury to the sediment and air may underestimate mercury concentrations at receptor locations due to local variations in the amounts of mercury in the water. It is known that mercury fell out in the creek in greater concentrations in some areas than in others, and it was not linear along the length of the creek.

For air, the dispersion model for Wolf Valley was a good choice and was reasonable. The assumption that mercury behaves like uranium in the Scarboro area was unsupported by any data. It may be a good model, but there are no data to support or refute it, which is a problem. Mercury volatilization from EFPC was probably a reasonable model.

For soil and sediment, many of the core data used and the model were good. Few soil samples were taken in Scarboro. There were 57 soil samples taken from Scarboro in the ORAU study that was used for this determination, and it was not explained how historic soil concentrations in Scarboro were calculated.

For Fish, linear regression of sediment and fish mercury concentrations was a good model. A great deal of data went into this analysis that compared sediment and fish. There were too few sediment cores used to estimate fish mercury concentrations. Averaging over large expanses of the creek or the rivers ignored the high sediment mercury concentrations in some areas of the creek. Default values for the lower end of EFPC were reasonable, but were highly uncertain because they were based on one sample measurement. The use of default fish mercury concentrations in place of linear regression, when sediment mercury concentrations were high, was not well justified.

**Discussion Points:**

- ◆ Dr. Malinauskas asked why the difference and the sum were not equal. The difference was given as 2,056,056. The sum was given as 2,025,056. Mr. Taylor responded that he thought that was a typographical error. Dr. Malinauskas pointed out that if that was so, then the amount actually not accounted for was more than indicated. Mr. Taylor replied that the sum should read 2,056,056. It was pointed out that it was the difference that was incorrect, not the sum.
- ◆ Mr. Manley asked if he understood Mr. Taylor to say that the mercury level in Scarboro was high. Mr. Taylor responded that in the area of East Fork Poplar Creek, corresponding nearest to Scarboro. Mr. Manley stated that Scarboro is not near the floodplain. So, when sampling soil in Scarboro, one finds that it is actually as low as it is anywhere in the city. Mr. Taylor explained that in this calculation, ATSDR is looking at water concentrations in the creek. The estimates of the water concentration in the creek were looking at how much of the mercury fell out into the sediment. So, the fact that there were large amounts of mercury in the sediment in that area of the creek that is closest to East Fork Poplar Creek meant that the precipitation and settling of the mercury was not linear along the creek. That

was part of the calculation used to estimate the water concentration in the creek. This is a weakness of the model assuming that this loss of sediment was linear, when it was not linear.

- ◆ Mr. Box asked what the concentration was in the sediment along Mile 2. Mr. Taylor indicated that he did not have that information with him. Mr. Box said the reason he was asking was because if it was fairly linear, one would expect it to be quite low down there, but if there was a fair amount there, one would think that portions of the mercury were being swept on into Watts Bar Lake. Mr. Taylor agreed and emphasized that for this calculation, Task 2 did not look into Watts Bar Lake. They were assuming that by the time one got to Poplar Creek, at the end of East Fork Poplar Creek, that the water concentration had diminished by 70% or so. That was the figure they used to calculate water concentrations.
- ◆ Dr. Davidson asked if the mercury and/or uranium were vapor. Mr. Taylor responded that it was a vapor. Mr. Taylor indicated that uranium is particulate. That is only one of the main differences between uranium and mercury. Uranium is heavier and is a particulate, whereas the mercury is in vapor form. These were the assumptions that were made based on the data they had about the releases to the environment. The question is: How much like uranium is mercury in its physical behavior? There was a discussion on the Task 2 report that indicated that uranium was released more often from the low stacks on the tops of the buildings than mercury. Mercury was released more often from windows at a lower elevation. So, it might be thought that more uranium got over ridge than mercury. On the other hand, mercury is a vapor and lighter and might have gone further. So, maybe more mercury than uranium got over the ridge. But maybe because uranium is a particulate, it would have fallen out in the Scarboro area more quickly because it is heavier, and so the mercury as a vapor would have gone further. In the end, Task 2 said the differences between their physical behaviors were not expected to amount to much difference. Unfortunately, there is no evidence provided for that. Therefore, he thought that the take home message was that the data themselves do not answer this question. It is a gray area. It is the best model that they decided they had available to use, and those are the weaknesses with which to consider the appropriateness and the value of this data.
- ◆ Mr. Lewis asked if that issue had been raised before. Mr. Taylor responded that he understood that during the development of the Task 2 Report, there were many discussions about this issue, and he was told that much arguing went on under the ORRHES banner, ORRHES being the committee that ran the Dose Reconstruction meetings. It was certainly a concern that came up in ATSDR's technical reviewer comments, and they were very skeptical of this approach. ATSDR has also heard from individuals who feel the same way. However, these are the data they have to work with.
- ◆ Based on the controversy, Mr. Lewis asked if the report was published anyway. Mr. Taylor responded that the report was published anyway.
- ◆ Dr. Craig stated that the body of water is now called New Hope Pond, and there was mercury coming down there. They took it out in the mid-eighties and replaced the whole pond. Mr. Taylor pointed out that this study was done when they called it Reality Lake.

- ◆ Mr. Box asked if there was any correlation related to the gold mining industry with regard to mercury concentrations in the water and sediment. Mr. Taylor asked if there was gold mining in this area. Mr. Box did not think there had been. Mr. Taylor explained to the rest of the group that mercury was used to pan for gold in surface waters, and it is one of the reasons why many of the creeks and streams in Central and Northern California are contaminated with mercury. Mr. Box's question was: Is there a correlation between amounts of mercury in those creeks that were used during the gold rush days, in areas where people mined for gold, and the data that ATSDR has for mercury in the soils, sediment, and the water. Mr. Taylor did not know. He has not seen any specific studies where that correlation was examined for EFPC or for the waters in the ORR area.
- ◆ Mr. Box indicated that they are having that problem in Brazil currently, and there is a lot of mercury going downstream. Mr. Taylor agreed that there were mercury problems in many places.
- ◆ Mr. Manley asked if there was a difference in the vapor pressure from mercury in the air versus mercury in the creek. Mr. Taylor did not know the exact difference in the vapor pressure. He knew that it was not a consideration in this study, because they took actual measurements from mercury in the vapor directly over the water to make the estimate. Mr. Manley commented that there had to be a good difference in the vapor pressure due to the temperature of the water being cooler than the air. Mr. Taylor agreed. He stated that the vapor pressure in the water would be lower than vapor pressure in the air because the water is cooler than the air.
- ◆ Mr. Malinauskas asked if Mr. Taylor was talking about elemental mercury and not organic mercury. Mr. Taylor affirmed that was correct.
- ◆ Mr. Lewis asked what Mr. Taylor's conclusion was regarding the soils and sediment measurements. Mr. Taylor replied that they have pretty good measurements of mercury concentrations in soils and sediment because there are real data and good models.
- ◆ Mr. Hanley asked why they did not use other cores. Mr. Taylor responded that he did not know. That is a really good question since there was so much data from the SAIC study, and they had already dated those core samples for use in estimating the soil and the sediment mercury concentrations.
- ◆ Mr. Lewis asked if there was anybody in the public who may understand the information just presented and who could clarify it. Mr. Taylor mentioned that he had some questions such as this one that he was proposing to the people who conducted the Task 2 study, and he is hoping to gather some responses back from them.
- ◆ Dr. Davidson stated that the questions that are raised during this meeting will be in the meeting minutes, and they can be addressed at a later date. Mr. Taylor explained that part of the problem is ATSDR is moving ahead on this PHA because they need to do that, and they are obtaining answers wherever they can find them. Those questions have been asked. There are a lot of questions that come up when one studies this material, and it is a huge amount of

material. Over all, they did an excellent job, but there are some questions and issues that the data simply do not answer. That is not going to change, but it is important to understand what they mean and what the significance of the data is.

- ◆ Dr. Craig thought that the numbers should have been 20% at the lower end of what they were in New Hope Pond. So, it is 1/5 as much mercury as opposed to 20% more. Dr. Taylor clarified that he meant to say 20% of the value of the mercury concentration at the Y-12 end.
- ◆ Dr. Craig stated that as he understood it, by defaulting to that, it was more conservative. Mr. Taylor stated that he did not know that, but what he would like to do is run the linear regression based on the actual sediment concentration and see how those fish concentrations would compare. The thing that concerned Mr. Taylor particularly was that the maximum mercury concentration in the sediment in the Great Lakes study were approximately one-half the maximum mercury concentration in the sediment in the vertical integration study. So, it may or may not be more conservative. Mr. Taylor's final words were that the data that ATSDR has may not answer all of the questions, but it is important to know what the strengths and weaknesses are. He indicated that he would be taking this work further when he looks at human doses in his next presentation.

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### Public Comment Period

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*Dr. Kowetha Davidson, Chair*  
*Oak Ridge Reservation Health Effects Subcommittee (ORRHES)*

Dr. Davidson announced the start of the second public comment period and asked if anyone would like to speak.

**Discussion Points:**

- ◆ Dr. Gordon Blaylock asked Mr. Taylor what form of mercury that was released to water and what form was measured in the water. Mr. Taylor responded that the Task 2 team assumed that the mercury in the surface water was inorganic. Dr. Blaylock asked if it was methyl mercury. Mr. Taylor replied that the form of the mercury really was not considered until they got the evaluation of the doses. So, there were some broad assumptions that all of the mercury that went into the air was elemental mercury, all of the mercury in the fish was methyl mercury, and all of the mercury in all the other media was inorganic. Dr. Blaylock asked how much of the mercury was assumed to be methyl mercury. Mr. Taylor indicated that it was assumed to be 100% methyl mercury in the fish. With regard to transformation of the inorganic or organic mercury into methyl mercury, Mr. Taylor thought that there was some speculation of how that could have occurred, but it did not go specifically into the calculations that they made. I think the discussion was that it is done through bacteria and so forth.

- ◆ Dr. Blaylock agreed that was a general assumption. He pointed out that Mr. Taylor talked about deposition of mercury in sediment, and it was not consistent, and with a flood in EFPC, usually, the water comes out. It lifts the surface sediment, and takes it downstream and deposits it in area where, when it slows down, there is a deposition. Mr Taylor stated that his thinking about that is that when the water levels come up again, that is another source of mercury feeding into the water. Dr. Blaylock replied that is providing there has not been more deposition on top. Usually that is the top layer of sediment. The mercury vapor coming out of the stacks is usually vapor, but it comes out and very quickly attaches to any particulate around it. So, it would be pretty much like other contaminants on particulates. Mr. Taylor responded that he did not recall that Task 2 described that. They just said that it was a vapor. Dr. Blaylock agreed that it was a vapor, but usually it comes out for a short distance, and then it will attach immediately to any particulate around it. He said that New Hope Pond was a pond above Lake Reality on EFPC, and it received depositions of everything from Y-12, coming out of the water. That was closed in the 1980s.
- ◆ Dr. Craig agreed that it was closed in the mid-eighties. They took out a lot of the sediment and buried it. Dr. Blaylock indicated that they took out all of the sediment and took it up on the hill. Then they built Lake Reality down below it, with the EFPC coming around it.
- ◆ Mr. Taylor asked if they ever both functioned at the same time. Dr. Blaylock and Dr. Craig both stated that they had never functioned at the same time. Dr. Blaylock added that now the water does not go through Lack Reality because they found that the fish in Lake Reality would get more mercury than if they were not there, if they went downstream.
- ◆ Mr. Taylor asked if there were any newer studies where they could estimate a maximum value of mercury in fish. Dr. Blaylock responded that there was quite a bit of fish data. He thought that the maximum value that one would find now is approximately .5 parts per million. Also, regarding the core samples, he asked Mr. Taylor to tell him again how many core samples were taken. Mr. Taylor replied that there were 159 transects of the creek, and each transect would have had approximately 6 or 20 different samples, depending on the length of the transect.
- ◆ Dr. Blaylock reiterated that they would only took 16 inches and 32 inches, and homogenized that. That was not an accurate way of doing it. They should have taken many more core samples, and instead they only had five that were sectioned. Of course, the first one would have come out in varied layers, and it was the dark layers in the sediment that would usually contain the mercury, and they were only about an inch thick. Mr. Taylor stated that what they did was a vertical integration study, where they looked at each inch. They figured out what that distribution looked like, applied that to the average value, and that was the homogenized value of the majority of the data. Dr. Blaylock asked how many core samples they had to base that on. Mr. Taylor thought that in the vertical integration study, they had five or six. Dr. Blaylock asked how many core samples were taken all together. Mr. Taylor did not know that number.

- ◆ Dr. Blaylock did not think that number was very good. He did not think that would stand up. He added that everyone knows that in many areas where they said that the concentration for mercury in the cores were around 200 parts per million, they would find over 1,000 parts per million. Mr. Taylor asked Dr. Blaylock if he was saying that the vertical integration study did not have enough samples or give a representative picture of the average distribution of mercury over the years. Dr. Blaylock affirmed that this was what he was saying. Regarding the fish samples, mercury in fish is usually methyl mercury. He asked what the mercury was assumed to be in the sediment. Mr. Taylor responded that they had assumed it to be inorganic mercury. They did not specify the type.
- ◆ Dr. Blaylock asked if there were sulfides. Mr. Taylor indicated they were sulfides and chlorides, maybe oxides. Dr. Blaylock thought that the correlation there was lucky as far as getting concentration in the fish and in the sediment. If one went downstream, there is very little mercury in the sediment, whereas other locations have a great deal. One can find that the fish along those areas have just as high mercury as one does in the areas where it is quite high.
- ◆ Mr. Taylor pointed out that one thing he did not know was how many of the samples were actually used in doing that correlation. A lot of data that were listed in a table over several pages, but it did not specify which data were used in the correlation. Dr. Blaylock commented that there are many samples of mercury in fish in EFPC, a large number. He wondered why they did not use that. Mr. Taylor explained that there were no fish samples taken before the early 1970s. Dr. Blaylock argued that there were plenty of samples taken before that, even for mercury. Mr. Taylor responded that they were not indicated in the task 2 report. He did not have that data. Dr. Blaylock stated that he would locate them and send him that information. There were two Masters studies on Y-12. There is some data before then. Most of the data was after the 1970s, and one could extrapolate down with the mercury and fish in other ways than just the correlation.
- ◆ Regarding the Great Lake studies, Dr. Blaylock indicated that he would never use that because there could be 10 parts per million in the sediment and 100 parts per million of mercury in the sediment in other locations, and have more mercury in fish where you have 10 parts per million because of a high methylation rate.
- ◆ Dr. Blaylock asked if the TVA took a lot of core samples. Mr. Taylor affirmed that they did.
- ◆ Mr. Blaylock asked if they also took water samples. Mr. Taylor indicated that they did.
- ◆ Dr. Bob Craig thought that Dr. Blaylock had just identified an excellent data source, which is the Environmental Science Division Library. They should have the Masters and PhD dissertations. Dr. Blaylock responded that he did not think they were in there. Dr. Craig pointed out that “Stan” saved everything. Dr. Blaylock indicated that “Stan” was not involved in this. This was Y-12. They knew the mercury was coming out in fairly high levels, in the 1970s, and of course, at that time that was classified. Dr. Craig suggested that they look over at the Development Division at Y-12. Dr. Blaylock stated that he did not know how much data was there, but he would see if he still had those theses.

- ◆ Dr. Davidson asked if anyone else from the public would like to address the ORRHES. With no more members of the public coming forward, she opened the floor for more questions for Mr. Taylor.
- ◆ Ms. Adkins asked if a possible reason for the variations in dilution along the way down the stream be the underground sinkholes, caverns, canals, and so forth. Mr. Taylor replied that Task 2 considered dilution looking at runoff surface water into the creek. They did not consider losses of water from the creek into sinkholes or other underground locations.
- ◆ Ms. Adkins asked if it would be possible for the ATSDR to check this time for those things. Mr. Taylor thought they could raise the question, but he was not sure that there were any places where the creek itself drains. He said he would have to ask someone who knew more about it.
- ◆ Ms. Adkins indicated that her question tied into one of her earlier questions regarding inferring things. She asked if it would make sense to do soil and water testing at sites where people actually have high mercury levels and live by springs that are bringing water in from the EFPC area. Mr. Taylor thought that the ATSDR would need to know more information about that. He did not think that the work he has been looking at indicates that there are locations where mercury is high from EFPC beyond Watts Bar Dam. The waterways that have been looked at carefully and that are part of the Task 2 report include only the surface waters from the Y-12 on down to Watts Bar Dam.
- ◆ Ms. Adkins asked if the ORRHES and the ATSDR has all the information that they need to make the decisions they are about to make without actually looking at things that the Task 2 people did not look at for one reason or another. Mr. Taylor responded that perhaps they did not, and he did refer in his talk very briefly to some areas that he will look at more closely. However, it is a question of whether he can find any information.
- ◆ Mr. Lewis noted that on slide three, the health outcome data and health implications, it appears to be a part of his effort. He asked ATSDR what they were going to look at, how it was going to be done, and if that data would be factored into ATSDR's conclusions. Mr. Taylor explained that the only health outcome data that he currently has that relates to mercury is information that individuals have brought to him. These people have told him that they have high levels of mercury in their bodies. This is personal information that people have shared with him. He was familiar with many of the studies that have been done around the ORR, and what data are available, although he did not think he was familiar with everything. He is not aware of any organized data sources such as registries that would give any information at all about mercury exposures. That effort has not been completed, but he did not know any health outcome data, other than personal reports, that are going to help with this assessment.



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**Work Group Reports, Discussion, and Recommendations**

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**Ad Hoc: Cancer Incidence Review Document**

*Dr. Pete Malmquist*

*Oak Ridge Reservation Health Effects Subcommittee (ORRHES)*

Dr. Malmquist explained that Dee Williamson had received all of the numbers from the states, has crunched them, and had sent the results back to the State of Tennessee for their review. She hoped to get the results from the state sometime in the next week, after which it has to go through an internal review at ATSDR, in Atlanta. Then it will be brought to the ORRHES. She planned to be at the PHAWG meeting the next Monday evening, not with figure results, but to talk about what will be in the report and how it is set up. Then, all of the results should be in for the June ORRHES meeting. The results will have to be put up for a public comment period as well. So, that may be done prior to the June meeting.

Dr. Malmquist then moved that the ORRHES recommend that ATSDR have a community strategy in place prior to the release of any results, and further that prior to the release of the strategy or data that the ad hoc group review both the strategy and results.

**Discussion Points:**

- ◆ Dr. Craig asked for clarification with regard to what the “ad hoc” group was. Dr. Malmquist explained that the group that the PHAWG chairman of the PHAWG had appointed. Dr. Malmquist indicated that he was the chairman of that group.
- ◆ Mr. Lewis thought that the ATSDR had a communications strategy and logic already in place for issuing any document or any meeting presentation. He wondered if he asking that them to at least bring it to the group for review prior to going out. If so, that process is supposed to already be in place. Dr. Malmquist stated that he did not know whether it was in place, but with 26 cancers across 8 counties and combining them, the ORR is going to have some high numbers, because the state is an average. The ad hoc group feels that it would like an explanation of all that prior to the results being known. He thought that with this issue, the ORRHES should be proactive. They have to be able to explain what the numbers are, what the position is, what was done, and how it was done prior to these results becoming public.
- ◆ Dr. Craig seconded the motion.
- ◆ Dr. Davidson stated that what Dr. Malmquist was asking for was for the ORRHES to deal specifically with the issue of the Cancer Incidence Review. For the vote she clarified that Dr. Malmquist was asking that ATSDR put a community strategy in place prior to the release of the results and that the results be reviewed by the ad hoc committee and the PHAWG before the release. Dr. Malmquist affirmed that was the motion.

- ◆ Mr. Lewis asked how that was going to be presented to the community, and if that was going to be part of the strategy. Dr. Malmquist affirmed that the release would be part of the strategy.
- ◆ Dr. Davidson indicated that the other issue was that after review by the ad hoc committee and then the PHAWG, the results would then be brought to the ORRHES, and it would be released to the public via the ORRHES. Dr. Malmquist affirmed that was the correct process.
- ◆ Ms. Mosby asked who was releasing this report. Dr. Davidson responded that the ATSDR would be releasing the report. He then called for the vote.

**Motion**

Dr. Malmquist moved that the ORRHES recommend that the ATSDR have a community strategy in place prior to the release of the Health Statistics Review results. Dr. Malmquist further moved that the Cancer Incidence Review's strategy and data be reviewed by the ad hoc committee, the PHAWG, and the ORRHES prior to its release to the public. Dr. Craig seconded. The motion carried unanimously. 12 in favor, 0 opposed, 0 abstentions.

**Public Health Assessment Work Group Report**

*Dr. Robert Craig, Chair*

*Public Health Assessment Work Group Report (PHAWG)*

Dr. Craig directed everyone to the PHAWG report in their packets. The PHAWG has met twice since the ORRHES's last meeting, and both meetings were targeted meetings. The first meeting, which took place on February 17, 2004, was to consider comments submitted for the Initial Release version of the White Oak Creek Radionuclide Releases Public Health Assessment (WOC PHA). The second meeting took place on March 15, 2004, with John Wilhelmi, a chemical engineer with ERG, under contract to ATSDR. He will be the Principal Scientist conducting the Toxic Substances Control Act (TSCA) Incinerator PHA and was invited to the PHAWG to present his initial approach and data sources. The only recommendation made was the one that was considered during the teleconference. That recommendation was submitted and passed at that meeting, and the WOC PHA comments be forwarded to the ORRHES and to ATSDR.

**Discussion Points:**

- ◆ Dr. Davidson stated that she has asked that the ATSDR ensure that John Wilhelmi's presentation that was given to the PHAWG be distributed to the members of ORRHES who were not at that meeting, so that they would know where the ORRHES is in the process of the TSCA Incinerator. Dr. Craig responded that he would distribute those to the entire ORRHES if they have not already received them.
- ◆ Dr. Davidson asked that any subcommittee members who had any questions about the incinerator, or who had any existing data regarding the TSCA incinerator that John Wilhelmi

might not know about, to get that information to Mr. Bill Taylor. Mr. Taylor added that all of the PHAWG meeting minutes are distributed to all of the ORRHES members.

### **Agenda Work Group**

Dr. Davidson indicated that Ms. Sonnenburg was not present for the Agenda Work Group, but they will continue to work with Ms. Horton in formulating the Agenda for the next meeting in June.

### **Guidelines and Procedures Work Group**

#### ***Ms. Karen Galloway, Chair Guidelines and Procedures Work Group***

Ms. Galloway indicated that the Guidelines and Procedures Work Group did not meet because they did not have a task, but she guessed that was about to change. Ms. Davidson agreed that was about to change because they now had a task before the next ORRHES meeting.

### **Communications and Outreach Work Group**

#### ***Mr. James Lewis, Chair Communications and Outreach Work Group***

Mr. Lewis indicated that the COWG did not have any formal meetings. He complimented Ms. Susan Robinson on what he considered an excellent presentation. He thought that would work toward creating a method of doing good outreach, and he thought that the entire subcommittee ought to continue to apply input there.

Additionally, he thought that the subcommittee would be remiss if they did not mention that they have lost a member of ATSDR who, in his opinion has done “a heck of a job” with outreach. Her name is Ms. Melissa Fish, and for this group not to acknowledge her loss, based on all that she has done, would be quite sad. Because she was the type of person that she was, and because she was so close to many people in the community, he and others hoped that she would have the opportunity, perhaps during her exit interview, to discuss some of the ORRHES’s activities in which she has been involved. Mr. Lewis further recommended that that discussion be with someone in senior management at ATSDR, like Dr. Falk. Mr. Lewis indicated that he did not know how the ATSDR conducted its exit interviews, but he hoped that when individuals who have worked in the community and who are familiar with that process had the opportunity to share their experiences with ATSDR, so that the agency would begin to have a better feel for what it takes to “package their science.” Ms. Fish reached out to the community to do that and she should have the opportunity to share her experiences and what she has accomplished. He asked that anyone who disagreed with him to raise their hands.

He also thought that Mr. Taylor did an excellent job on this effort in talking with Ms. Robinson. He has provided a nice template that the ORRHES ought to consider adopting for all contaminants of concern. He thought that they should approve it and create the template, so that it could be put on the web site. He thought it was quite user-friendly. He suggested that the items he discussed be followed up as action items

**Discussion Points:**

- ◆ Mr. Hill asked if he could make two suggestions before the subcommittee lost their quorum, given that he had two tasks for the ATSDR. One of them he heard from Susan that morning, that when she was not at a meeting, there was information handed out at the meeting that she did not receive. He asked to make it a task that when an ORRHES member is not present or somebody has to leave early, that they ensure those persons are provided with any literature or information that was handed out when they were not present. The second task was when the ORRHES makes a recommendation and the ATSDR decides not to fulfill that recommendation, that the ORRHES be notified, either by e-mail or somehow, prior to the next meeting. Certainly, they are only recommendations, and ATSDR can do whatever they want to with them. However, he asked that whenever they did anything other than what the ORRHES asked them to do, that the ORRHES be notified as soon as possible, so that people would not walk into a meeting and find out that something did not happen.
- ◆ Dr. Davidson stated that at this point, the ORRHES had to make a decision, because there was one more work group presentation scheduled, and several members had to leave, and so the subcommittee was going to lose its quorum. It was noted that they had already lost their quorum.
- ◆ Ms. Horton explained that technically they could not even have a meeting without a quorum. They could go ahead and continue with information sharing, but there could be no voting or no further recommendations

*Having lost their quorum, the ORRHES meeting was officially adjourned.*

**End of Summary Report**

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## Post-Meeting Information Sharing Session

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### Overview

Ms. Horton asked Ms. Robinson if she would continue to take notes, but noted that officially, the meeting had ended. Ms. Robinson agreed to do so.

### Discussion Points:

- ◆ Ms. Libby Howse suggested that the DHEP update be deferred until the next ORRHES meeting. They would then have more to share and could share it during an official meeting. Dr. Davidson stated that at the request of ATSDR, the ORRHES would defer the DHEP report until the next subcommittee meeting on June 8, 2004. She asked Mr. Pereira to go give his Project Management Status Update, and then they would defer their end of the meeting general announcements and go over the list of action items before they left, so that they would have a record of all of those items.

### Project Management Status Update

Mr. Pereira announced that since the last meeting he has become a grandfather twice more. He then explained that staff had advised Dr. Falk directly about submitting nomination packages for the people who are currently on the subcommittee. He knows, traditionally, that they are really cracking down on allowing members to be renewed. What staff is going to do is take the existing body and recommend a one-year extension, which would put them until December 31, 2005. If the ORRHES is not finished with its business by then, which he hoped they would be, they can ask for an extension of up to six months. That has already been granted. However, part one has to happen first. They have a grant of the original request to December 31, 2005. If that does not happen, Plan B is that the ORRHES will be able to go until approximately June 2005.

With the existing body, no renewal is required. The ORRHES could still go until June 2005 as they currently sit. After June 2005 the ORRHES, would basically be finished if they do not renew. The ATSDR will still travel to Oak Ridge, and the group could still meet to discuss everything that they have been doing to this point, whatever is not finished, except there will be no ORRHES. That would be the only difference. Obviously, ATSDR wants to support the December 2005 date, with a possible six-month extension on top of that, if needed. Dr. Falk will be updated at all times regarding where the group is, where it is going, and what Committee Management says about what the ORRHES can and cannot do. Dr. Falk will specifically review the packet request and the documentation that is being put forward.

During the week following this meeting, the staff members will be discussing Melissa Fish's vacancy and deciding on the best strategy to fill that void. Mr. Pereira stated that he was also going to introduce Ms. Loretta Bush, but that was done earlier in the meeting. Regarding funding, if they did not get a cut in funding, and if they maintain some sense of frugal spending, they should be okay with the ORRHES as it is currently operating. He did not see any major glitches, unless something arose upon which the subcommittee wanted to spend a lot of money.

Regarding the Iodine and Groundwater PHAs, staff plans on having a discussion on that, with a pre-discussion on both of those with the PHAWG no later than August 2004. There will be some documentation on both of those PHAs on or before August 2004, certainly with the PHAWG.

*Discussion Points:*

- ◆ On behalf of Ms. Kaplan, Ms. Galloway, and others, Mr. Lewis said he thought that someone who had some facilitation skills needed to assist Ms. Galloway with the next Guidelines and Procedures meeting. He thought that some valuable input would come out of that meeting, but he thought that it should definitely be facilitated, so that everyone could lay their cards on the table and then get to work rebuilding mutual trust and making the ORRHES even stronger. He hoped that the agency could work with the ORRHES to become more cohesive and get the mutual trust back. He believed there were some terrific ideas, and he thought that the group would be able to come to consensus on some of those. For example, there has been talk about reducing the duplication. One suggestion has been to combine the NAWG and the COWG. He thought perhaps the CIB and DHEP could come together. If they get together working on communications and health education, then there would be less conflict in the ORRHES. He also thought the issue that the ORRHES brought up about identifying whether the ATSDR was following up on action items was one that needed to be addressed. If they could not get recommendations accepted, then they needed to know what was happening to all of the action items.

As a COWG member, Mr. Lewis has heard many people from the lay side say that they do not feel comfortable. There is this concept with ATSDR of a “need to know” with regard to technical information. It may be that sometimes the technocrats decide that something is too technical for lay people, and so information is withheld. Mr. Lewis thought that the both the ATSDR and the ORRHES needed to be willing to share information with the public and present it to them the best that they could. These arguments have occurred before, and he thought that there was enough on the table that if they laid them out and offer a “lessons learned,” all of this could be cleaned up and the subcommittee could move forward. He hoped that the ATSDR would consider endorsing that stance, so everyone could get the maximum out of this process.

- ◆ Regarding the work groups, Mr. Pereira stated that they were going to discuss that in Atlanta, in terms of what ATSDR thinks as an agency. He asked them to keep in mind that work groups are formed, and dissolved, and created at the behest of the Chair and ORRHES as a whole, and the agency certainly can make recommendations as to what they think is an approach to consider. Mr. Pereira did think the NAWG and the COWG had been on wider parallel lines in the past, and he thought that those parallel lines are getting closer and closer together. Perhaps it is time to consider combining those two work groups. Regarding the action item issue, he stated that Ms. Loretta Bush will not let one stone go unturned, or one piece of paper not be addressed in terms of doing her job. She is one of the best in the business, and one of the best that he has ever worked with since he has been with ATSDR. So, he has full confidence in the community involvement activities that she does or assists

with in concert with the ORRHES and DHEP, in the development of any strategy that this group puts forth.

- ◆ Mr. Lewis commented that Ms. Melissa Fish and Mr. Bill Taylor did an excellent job of working together. They do more of a community outreach in getting the needs of these people heard and identified, and he thought that their skill sets need to be used sometimes in guiding this effort, even in these meetings. Although Ms. Fish is gone, Mr. Taylor has done a lot with commanding respect. There is a difference between holding a position and commanding respect. Because someone is on the ground, they may have earned more respect, but that also holds true for himself, as a chair of a work group and other chairs. If the group can utilize that and bring mutual trust back, and use those people in appropriate ways, he thought that the group could be brought closer together so that they could move through this, because the group might not always understand the technical requirements.
- ◆ Dr. Davidson commented that she would put on the next meeting's agenda the issue of what to do about the COWG and NAWG. She indicated that Ms. Horton would go over the action items for this meeting so that those would be on record.

### Action Items

#### *Ms. Marilyn Horton, DFO Oak Ridge Reservation Health Effects Subcommittee (ORRHES)*

Ms. Horton stated that the meeting resulted in the following action items:

- Change the EPA's "clean-up level" in the three brief PHA documents to read, "the upper bound of risk range."
- Mr. Pereira and Mr. Richards will meet to discuss the EPA's Monday night meeting for June 7, 2004.
- Mr. Pereira and Mr. Richards will meet and clearly define meeting objectives and set a clear agenda for the Monday night forum.
- ATSDR will follow up with Ms. Galloway regarding Ms. Adkins' question on whole body counts and the minimum protective level for whole body counts. Staff will be in touch with Ms. Galloway and her supervisor.
- Ms. Horton will work with Ms. Michelle on obtaining the article she found on low dose chronic exposure to radiation. She will get that to Mr. Taylor, and then Ms. Horton will forward it out to the group.
- Staff will be updating the Web site Creative Brief.
- Ms. Michelle will be added to the COWG group, to review the Web Site.
- We'll distribute the Task 2 Report technical review that was distributed at previous PHAWG meetings. That will be distributed to all ORRHES members who did not receive those in the PHAWG minutes.
- Mr. Bill Taylor will double-check the soil and sediment data on the sample below sixteen inches for mercury. (Slide 14 of his presentation)
- ATSDR will send follow-up information to people who are absent from ORRHES meetings, including any handouts and/or presentations.

- ❑ ATSDR will notify ORRHES prior to a meeting, if they do not plan to follow an entire ORRHES recommendation.
- ❑ A discussion with regard to the possibility of combining the NAWG and COWG will be added to the next meeting agenda.
- ❑ Ms. Dee Williamson will present her information on the Cancer Incidence Review.

**Discussion Points:**

- ◆ Ms. Horton asked Dr. Charp if he checked on the Cesium-137. Dr. Charp indicated that rounding it off to the nearest hundred, it is about 6,600 days.
- ◆ Mr. Lewis reiterated that he and others had a discussion about the facilitation of the upcoming meeting. They talked about how they were going to facilitate that, who was going to facilitate it, and he thought they were going to have a discussion with Dr. Davidson. Some ideas that he had were that perhaps a joint facilitation between EPA and ATSDR. He also suggested that they select a facilitator with whom everyone could feel comfortable. Ms. Horton indicated that item would be added to the list, and that Mr. Pereira and Mr. Richard could follow up on that issue and would take that into consideration. Mr. Lewis added that he thought that they had talked about facilitation, because Ms. Kaplan had that as part of her comments. He thought that the input needed to come from the ORRHES with regard to members sharing ideas on who might be appropriate facilitators.
- ◆ Ms. Horton asked if the facilitation was part of Ms. Kaplan's motion. Mr. Lewis indicated that he did not think it had been part of her motion, but the group agreed to send the recommendation to Ms. Galloway, and he thought that part of what the group was talking about was rolling that into her group for discussion. He thought that part of the issue had been that a good facilitator needed to be present during sensitive meetings. He was going to suggest certain facilitation skills, and so he wanted to ensure that the suggestion was reflected in the minutes, if it had not been captured earlier.
- ◆ Ms. Horton announced that the next ORRHES meeting was scheduled for June 8, 2004, in Oak Ridge, with the EPA and ATSDR evening forum the night before, on June 7, 2004.

*With that, the information session was adjourned.*

**End of Information Sharing Session**

