

**OAK RIDGE RESERVATION HEALTH EFFECTS
SUBCOMMITTEE (ORRHES)**

**CENTERS FOR DISEASE CONTROL AND PREVENTION
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY**

Detailed Proceedings of the September 22, 2005, ORRHES meeting

Call to Order/Opening Remarks

The Oak Ridge Reservation Health Effects Subcommittee (ORRHES) convened on September 22, 2005, in the Alpine Room at Oak Ridge Mall at 333 East Main Street, Oak Ridge, Tennessee. Chairperson Kowetha Davidson called the meeting to order at 12:30 p.m.

Introduction of Subcommittee Members and Attendees

Kowetha Davidson asked all attendees to introduce themselves. The attendees present during the meeting were:

Kowetha Davidson, ORRHES Chair
Peggy Adkins, ORRHES member
Don Box, ORRHES member
Herman Cember, ORRHES member
Karen Galloway, ORRHES member
George Gartseff, ORRHES member
Jeff Hill, ORRHES member
David Johnson, ORRHES member
James Lewis, ORRHES member
Tony Malinauskas, ORRHES member
Pete Malmquist, ORRHES member
Charles Washington, ORRHES member
Chudi Nwangwa, Tennessee Department of Environment and Conservation liaison
Jon Richards, U.S. Environmental Protection Agency Region IV liaison
Brenda Vowell, Tennessee Department of Health liaison
Marilyn Horton, Designated Federal Official for ORRHES
Loretta Bush, ATSDR
Paul Charp, ATSDR
Burt Cooper, ATSDR
Jack Hanley, ATSDR
Sandy Isaacs, ATSDR
Karl Markiewicz, ATSDR
Rachel Powell, ATSDR
Ken Rose, ATSDR
Bill Taylor, ATSDR
Amanda Bird, TA Consulting, Inc.
John Merkle, member of public
Lynne Roberson, member of public
Scott Fraker, *The Oak Ridger*
Ellen Rogers, *The Oak Ridger*
Liz Bertelsen, ERG

1 John Wilhelmi, ERG
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4 **Agenda Review and Correspondence**
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6

7 **Agenda Review**

8 Dr. Davidson reviewed the main agenda items. (She explained that Sandy Isaacs was there in
9 place of Bill Cibulas, who could not attend due to illness.)

- 10
- 11 • Status of action items.
 - 12
 - 13 • Project management update on the 2006 fiscal year budget.
 - 14
 - 15 • Update on the pre-draft final Toxic Substances Control Act (TSCA) Incinerator public health
16 assessment (PHA), presented by John Wilhelmi.
 - 17
 - 18 • Presentation and discussion of the draft PHA for public comment titled *Evaluation of*
19 *Current (1990 to 2003) and Future Chemical Exposures in the Vicinity of the Oak Ridge*
20 *Reservation*, presented by Karl Markiewicz.
 - 21
 - 22 • Public Outreach Plan for the Assessment of Cancer Incidence (ACI).
 - 23
 - 24 • Overview of the National Academy of Sciences (NAS) Biological Effects of Ionizing
25 Radiation (BEIR) VII Committee's Report.
 - 26
 - 27 • Work group reports and recommendations.
 - 28
 - 29 • Update on collecting information on the community surrounding the Oak Ridge Reservation
30 (ORR).
 - 31
 - 32 • Two public comment periods.
 - 33

34 Dr. Davidson noted that the work group reports might need to be moved around because two
35 people had to leave early. She stated that they would complete their agenda, even if they had to
36 stay beyond the scheduled completion time.

37
38 **Correspondence**

39 Since the May 3, 2005, ORRHES meeting, Dr. Davidson had only received a copy of the Local
40 Oversight Committee's (LOC's) response to comments on the draft PHA titled *Evaluation of*
41 *Potential Exposures to Contaminated Off-Site Groundwater from the Oak Ridge Reservation*.
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Discussion: June 28, 2005, ORRHES Meeting Minutes

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4 Dr. Davidson asked if there was a motion to approve the June 28, 2005, ORRHES meeting
5 minutes. Pete Malmquist moved to accept the minutes and Don Box seconded the motion.
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7 James Lewis asked whether a comment made by Mark Evans, which in his opinion had helped
8 set the tone of the last meeting, had been added verbatim to the minutes as he had requested. He
9 said he had not had a chance to review the minutes again, but indicated that he had made Marilyn
10 Horton and others aware of Dr. Evans' comment and had asked for it to be included. If the
11 comment had not been incorporated, he asked why not. Dr. Davidson asked whether Mr. Lewis
12 had submitted it as a written comment. Mr. Lewis said that he had not, but that he had conveyed
13 his request to Ms. Horton, Bill Taylor, and Trent LeCoultre. According to Mr. Lewis, Ms.
14 Horton had said this would be addressed. Ms. Horton said she would have Liz Bertelsen listen to
15 the tape recordings again, and that the comment would be added to the minutes if it was on the
16 tape. She noted that they are listening to their comments.
17

18 Mr. Lewis stated that this change had not yet been made, so they would be approving minutes
19 before this was covered. Ms. Horton pointed out that Mr. Lewis had made a comment on the
20 minutes before they were distributed. Mr. Lewis replied that he had been given a copy and
21 flagged this. He asked if this had been revised or if the words were the same. Ms. Horton said
22 she believed the minutes were the same—that they did not include this additional comment. Mr.
23 Lewis responded that he had been told that this issue was being taken to Dr. Cibulas or to
24 someone else to determine whether or not Ms. Bertelsen would modify the minutes. He asked
25 whether this had been done. Ms. Horton explained that she would have Ms. Bertelsen listen to
26 the tapes to see if the comment is there; the comment was not initially heard, and therefore it was
27 not included in the minutes. In his opinion, Mr. Lewis said, it was important for this to be taken
28 care of as it relates to the tone of things because the comment establishes the ramifications of the
29 information that follows. He said he was not sure how to handle this, questioning whether they
30 should approve these minutes with the commitment that the tapes will be listened to. According
31 to Mr. Lewis, the preparer of the report had listened to the recording and there was agreement
32 that this was not reflected in the current set of minutes.
33

34 Dr. Davidson said that Mr. Lewis's comments were noted. In her opinion, however, this
35 comment had been made near the end of the meeting and did not really set the tone. Although it
36 may have caused some problems after that point, she said, the tone of the meeting was set before
37 then. She suggested that they vote on whether or not to approve the minutes.
38

39 Charles Washington said that they needed to amend the motion before the vote; Dr. Davidson
40 replied that no motion had been made to amend the minutes. Mr. Washington stated that he
41 would make a motion to amend the minutes as enumerated by the said person. Dr. Davidson
42 explained that they needed to be more specific in their motion to indicate exactly what they were
43 amending. Mr. Washington indicated that he did not understand, but Mr. Lewis said he could
44 clarify. Dr. Davidson stated that, since Mr. Lewis understood the situation, she would allow him
45 to make the motion for Mr. Washington without going back through the discussion. Mr. Lewis
46 made the motion to withhold formal approval of the minutes until this particular issue was

1 addressed or they had something as part of this effort showing that the minutes needed to be
2 modified or changed based on the review of the tape. Dr. Davidson confirmed that Mr. Lewis
3 was making a motion to withhold formal approval of the minutes. He said that this was his
4 motion, expressing his belief that there was timely awareness of this issue and it was understood.
5 George Gartseff seconded the motion.
6

7 In his opinion, Mr. Washington said, this was not all necessary because they were requesting that
8 the minutes be accurate. He said that it was required that accurate minutes be provided to this
9 body. He expressed his belief that the motions were really inappropriate because the minutes
10 should just present what took place at the meeting. Dr. Davidson explained that no one was
11 questioning the accuracy of the minutes. Instead, they were asking for a statement to be included
12 that had not previously been included. She said that this was a matter of adding something to the
13 minutes—not a matter of questioning what was already in them. Mr. Washington said that this
14 change would make them accurate. Dr. Davidson noted that ORRHES does not have transcripts
15 for its meetings, so it can have accurate minutes without having every statement included.
16

17 Mr. Lewis stated that he did not want to spend much time on this issue. In his opinion, he said,
18 the issue was relatively simple and Ms. Horton was familiar with the passage he was referring to.
19 Mr. Lewis said that this statement made about another product had caused a lot of things to
20 transpire in the meeting, especially after Dr. Cibulas talked about the tone. Mr. Lewis expressed
21 his belief, if ATSDR establishes a tone, it is important that the agency stand up for what it is
22 doing and live in accordance with that.
23

24 Dr. Davidson asked the subcommittee to vote on delaying approval of the minutes. There were
25 seven votes for the motion and it passed.
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Status of Action Items

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31 Ms. Horton said there were no action items to report.
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Project Management Update

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37 Sandy Isaacs explained that Dr. Cibulas sent his regrets: he was very sick and unable to come to
38 the meeting. He asked Ms. Isaacs to provide general information about the Centers for Disease
39 Control and Prevention's (CDC's) and ATSDR's response to Hurricane Katrina. She said that
40 this was the largest response the agency has had, and it might be of interest because some of the
41 people who have attended these meetings were part of that response, including Tom Sinks,
42 Henry Falk, Ms. Horton, and Lieutenant LeCoultré. They were on the ground in different places
43 throughout Mississippi.
44

45 Ms. Isaacs said that they sadly had to report that Dr. Taylor is leaving to go to the Food and Drug
46 Administration (FDA). She noted that this information had been sent out in an e-mail, but said

1 she wanted to say a few words about Dr. Taylor and about his service to this community and to
2 ATSDR. She explained that he had worked for ATSDR twice. The first time, he came to the
3 agency in 1992 and stayed until 1998, when he also left to go to FDA. After Bill Murray left the
4 field office, ATSDR persuaded Dr. Taylor to come back. Ms. Isaacs said she believed most
5 people would agree that Dr. Taylor sets a tone whereby people can gain confidence and can talk
6 to him very forthrightly. She said she very much regretted that FDA was gaining him again. She
7 announced that ATSDR had a certificate of appreciation for the work Dr. Taylor has done in Oak
8 Ridge, at ATSDR, and at the field office. She asked Dr. Davidson to present Dr. Taylor with the
9 certificate. Dr. Davidson expressed that the subcommittee really appreciated the work he had
10 done here in Oak Ridge, and that he made a presence of ATSDR in the community. As the Chair
11 of ORRHES, she said, she would like to thank him for his service to the subcommittee. Dr.
12 Taylor thanked everyone, stating that he had enjoyed getting to know all of them and the work
13 here.

14
15 Mr. Lewis said that he had worked pretty closely with Dr. Taylor, Mr. Murray, and many other
16 people within ATSDR. He expressed his belief that Dr. Taylor has been a breath of fresh air for
17 him and for many people who were not at the meeting. He stated that Dr. Taylor can interact
18 with all parties, including activists and technical people, which in his opinion was a missing
19 element prior to his arrival. He expressed concern that losing Dr. Taylor will have a major
20 impact on whether they have a good outreach program in place. In his opinion, they would be
21 much further along if they had people like Dr. Taylor who can go and interact with these groups,
22 and if they had this type of support and things got out in a timely manner. He expressed his belief
23 that this was pretty close to devastating; he was not saying that people could not be replaced, but
24 as of this point, he said, he had not seen this type of talent, commitment, heart, and drive to meet
25 the needs and concerns here in a technical and professional fashion. According to Mr. Lewis, it
26 was crucial to consider this. He asked that they give Dr. Taylor a special round of applause for
27 his effort and the difference he has made in this area. Mr. Washington said he wanted to
28 associate himself with the words of Mr. Lewis. Ms. Isaacs expressed her appreciation for the
29 comments about Dr. Taylor, indicating that they will very much miss him as they have found
30 him to be a critical part of their team in Oak Ridge and at other sites as well.

31
32 Ms. Isaacs said she needed to bring the subcommittee up to date regarding what the agency
33 knows and does not know about the fiscal year 2006 budget, and how it will impact the work at
34 Oak Ridge. The agency is anticipating a change in the U.S. Department of Energy (DOE)
35 funding for fiscal year 2006. Because of the uncertainty, however, ATSDR must work under the
36 most conservative budget assumptions. Its priority is to work on the PHAs to the extent possible.
37 The next step of the process requires that the two bills (House of Representatives and Senate) go
38 to conference for markup, but given the current priorities of Congress the time frame is
39 unknown; it looks like it will happen after October 1.

40
41 Ms. Isaacs began to lay out how the agency has to proceed given the uncertainties of the budget.
42 Frankly, she said, the agency was making very conservative assumptions, but it had to try to take
43 the most responsible public health actions it can. Within the agency, she said, the highest priority
44 is completing as many PHAs as possible. When the documents are completed, they will be made
45 available to the public in ways that the agency has always used, such as repositories at libraries

1 and in different places throughout the impacted communities; they will still be available on the
2 Internet as well.

3
4 Ms. Isaacs noted that the ATSDR Oak Ridge Field Office will be closed at the end of September,
5 and will remain closed until the agency is more certain about the budget. She indicated that
6 ATSDR still plans to work with the community to the extent allowed by the budget. She pointed
7 out that ATSDR is not going away, adding that Jack Hanley, Ms. Horton, and other staff
8 members who they have worked with will still be there. In addition to ATSDR, she said, they
9 could also contact CDC at 1-800-CDC-INFO about health issues that they might have.

10
11 With the limited resources, she reiterated, ATSDR finds it imperative to produce the health
12 assessments that have been started to the extent allowed by the uncertainties. If the budget
13 allows, ATSDR plans to have—at a minimum—public meetings as the documents are released to
14 allow input from the community, as well as public comment periods on the documents. The
15 agency does not know, however, how much it can support ORRHES at this time. As more is
16 learned about the budget for fiscal year 2006, ATSDR will have a better idea of the feasibility of
17 supporting work group meetings and ORRHES next year. Now, however, they did not know
18 where they were. Ms. Isaacs expressed that the wish of the agency is to continue having
19 ORRHES and meetings, and to remain on schedule. She indicated that the people of Oak Ridge
20 are very important to ATSDR, but that the uncertainty of the budget is driving these decisions.
21 She expressed her commitment to inform the ORRHES members as soon as anything is known
22 about the 2006 fiscal year budget.

23
24 Herman Cember asked when ATSDR would know about the budget. Ms. Isaacs said that this
25 was uncertain. She explained that there are two versions of funding proposals that have not gone
26 to conference or been scheduled (to the agency's knowledge). The bills have to go to conference,
27 will require some sort of conference language, and then will be given for signature. In the past,
28 she said, ATSDR might not have received the budget until the next calendar year, but had an
29 indication of where the levels would be. Now, however, the agency did not know. As soon as
30 ATSDR knows something, it can reassess its ability to support ORRHES meetings. Dr. Cember
31 expressed his belief that they could meet until June 30, 2006, under the sunset parameters. Ms.
32 Isaacs said that this was correct, but that they would not be able to schedule any ORRHES
33 meetings at this time. She indicated that they were not closing the Federal Advisory Committee
34 Act (FACA) per se, but that they were leaving it open until there was more certainty about the
35 budget. She stated that there were disparities in the two bills, and ATSDR did not know whether
36 it would receive almost what it got last time or if it would take a big hit.

37
38 Mr. Lewis stated that he had heard Ms. Isaacs say that she had high hopes that this work would
39 have been completed. He expressed concern that they have been here for nearly 5 years. During
40 that time, according to Mr. Lewis, they have almost begged and asked for a definitive project
41 plan that provides an overview of where they are and where they are going. He explained that a
42 project plan would have indicated the various steps that could be looked at, eliminated, or
43 speeded up; however, he said, they had never received an adequate project plan to enable them to
44 do this. He expressed concern that the intended course of action was to complete the work that
45 been started. Instead, in his opinion, since they were running out of money and were in a critical
46 stage, they should consider the remaining items and determine those that would have the most

1 benefit. He expressed his belief that there was much “low-hanging fruit”—things they were
2 concentrating on that did not get the most bang for the buck. For example, he said, they
3 evaluated the TSCA Incinerator, which was basically a current topic with one or two issues.
4 Since money was running out, he recommended, ATSDR should look at the “heavy hitters” that
5 would have the most impact on the community. He suggested evaluating what could be done to
6 accelerate this and to focus the remaining time and money on the issues that will be most
7 beneficial. Mr. Lewis said he had not heard this from any member of the project management
8 team, but they have heard that ATSDR is running out of money. To this day, he said, it has
9 seemed as though it was business as usual. He stated that he would like to see a proposal
10 reviewed by ORRHES to determine what to focus their efforts on and to consider what needs to
11 be done in those areas. In his opinion, he said, the low-hanging fruit was not of much benefit to
12 them. He asked if there was a possibility that ORRHES could look at this, figure out what they
13 were doing, and determine what would have the greatest impact on the community. Then, based
14 on their suggestions, ATSDR could put most of its efforts into the identified areas and possibly
15 combine some of the other issues so they could move on.
16

17 Ms. Isaacs indicated that ATSDR is open to input on this. She said that she could not, however,
18 promise that there would be another ORRHES meeting. Mr. Lewis stated that he was asking that
19 ORRHES and the community provide input though whatever methods are necessary; he was not
20 implying that there had to be an ORRHES meeting. He expressed an interest in having an action
21 or recovery plan laid out to them instead of only hearing that ATSDR is going to continue its
22 work that has already been started. He said that perhaps he was wrong and should not think like
23 this, but this did not sound right to him. He reiterated that they have been here for 5 years and it
24 had taken the other group 9 years to conduct the original exposure evaluations. In his opinion,
25 the community deserves something in the specific areas where they have health concerns. He
26 recommended that ATSDR focus its limited resources on the areas that would do the most good.
27

28 Ms. Isaacs said that she certainly agreed that ATSDR would like to focus on things that would do
29 the most good. She explained that because the agency does not know the level of funding, it
30 cannot determine if any more ORRHES meetings can be supported. She said that, if appropriate,
31 perhaps a discussion of priorities could take place under new business. She indicated that
32 community member meetings are also an open way to provide suggestions; however, they could
33 not give consensus advice because such meetings would not be under the auspices of ORRHES.
34 She added that nothing precludes them from having their own group meetings and meeting as
35 individuals to provide advice. In addition, she said, ORRHES could give ATSDR advice at this
36 meeting that ATSDR would welcome and take forth. She emphasized that ATSDR is very
37 uncertain about the budget. One issue is being able to fund salaries: the agency does not know
38 about staff level in house as well as being able to support ORRHES. Ms. Isaacs explained that
39 the Senate’s language offers \$2.7 million for the U.S. Department of Health and Human Services
40 (HHS), giving emphasis to worker support for the National Institute for Occupational Safety and
41 Health and mentioning a dose reconstruction for Los Alamos (being done by CDC’s Radiation
42 Studies Branch). There is no mention, however, of ATSDR. Thus, even when the money is
43 passed from DOE to HHS, ATSDR will still not know about its budget. Internally, she said,
44 ATSDR does not know how its staff will be impacted until there is more certainty about the
45 budget.
46

1 Mr. Washington said he understood Ms. Isaacs' plight as a manager, but stated that someone at
2 ATSDR had to understand their plight. He explained that many ORRHES members have been
3 involved with this issue for longer than the 5 years the subcommittee has existed, as some have
4 served on other boards and worked with this issue in other ways. Of the three or four major sites
5 throughout the nation, in his opinion, Oak Ridge deserved the most attention to help people
6 silence many of their fears. According to Mr. Washington, people in this community believe they
7 became ill because of many of the things that took place in Oak Ridge. While Ms. Isaacs might
8 be doing her best, he said, maybe the subcommittee or another board could do something or the
9 ORRHES members could talk with their representatives and senators. He expressed his belief
10 that Oak Ridge needed the attention of someone because this could not go on forever. In his
11 opinion, he said, they wanted to finish this as soon as possible with an endpoint that satisfied the
12 people in this community, which it seemed they were not getting. He said he was as disappointed
13 as Mr. Lewis. He expressed his belief that they were not getting attention because they are not
14 screaming at everybody and getting in the streets to do whatever it takes to get the work done as
15 people might have done at other sites. Nonetheless, according to Mr. Washington, they needed
16 the attention of all of the agencies, including the U.S. Environmental Protection Agency (EPA)
17 and others. He said that they needed to understand that operating this site for the past 50 years
18 has contaminated Tennessee from Oak Ridge to Chattanooga. They needed definite answers
19 now, he said; many of them would not like to work on this for another 5 years without having
20 any answers. He asked who they could write to in order to get the attention they needed.

21
22 Dr. Davidson explained that any ORRHES member could write to his or her congressman or
23 senator as a citizen of the community, but not as an ORRHES member. She said that they could
24 not use their positions as ORRHES members because they are special government employees,
25 not allowed to lobby Congress. Mr. Washington stated that he understood this because he has
26 served on other committees. He said, however, that subcommittee members could write to the
27 Chairman of DOE and tell him about the plight of Oak Ridge, adding that he has done this before
28 while serving on other committees.

29
30 Mr. Lewis pointed out that agencies were represented at the meeting, including the Tennessee
31 Department of Health (TDOH), the Tennessee Department of Environment and Conservation
32 (TDEC), and EPA. In his opinion, some of these reports were only going over documents
33 produced by other people and rehashing a lot of the same things that have already been done. He
34 expressed his belief that some of these things could probably be handed over to the state, adding
35 that the state effort in Loudon County appeared to have worked well and been executed in a
36 timely manner. He stated that he had been told this effort was crude, but said he felt that it met
37 most of the needs of the people (with some refinements). He indicated that there were
38 alternatives and suggestions they could make for ATSDR to bring back to whoever is in charge
39 for consideration. For instance, he said, some people have gone directly to TDEC to address
40 issues on groundwater. He asked what tasks could be taken away from ATSDR and given to
41 these other agencies. In his opinion, they should utilize some of their talent that has been brought
42 in to help with these issues, such as the senior scientists who have done a great job for them, but
43 there was no need to repetitively evaluate things that have already been addressed. He expressed
44 his belief that ORRHES had enough talent to help ATSDR identify what needs to be done.

1 Regardless, Dr. Davidson said, it would be much easier for them if ORRHES and ATSDR had
2 no policies that they had to adhere to so they could do things in the way they wanted and when
3 they wanted. She explained that they are somewhat hindered because of the certain bounds that
4 they have to operate within.

5
6 Peggy Adkins said she wished she heard all of Mr. Lewis's comments, but that it sounded like he
7 was on a good track.
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Discussion of Oak Ridge Reservation PHAs: Status and Priorities

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13 According to Mr. Hanley, ATSDR has made tremendous progress on the PHAs in the last 6 to 9
14 months, particularly this past summer. During the last few months, ATSDR has responded to
15 public and peer review comments on the TSCA Incinerator PHA. In addition, ATSDR released
16 its public comment version of the PHA on off-site groundwater, which had never had a public
17 health evaluation. The public comment period has been extended to allow more time for
18 comments. ATSDR would be receiving the ORRHES comments on this PHA at the meeting
19 today; ATSDR has also received other public comments. Next week ATSDR will release, for
20 public comment, the draft PHA titled *Evaluation of Current (1990 to 2003) and Future Chemical*
21 *Exposures in the Vicinity of the Oak Ridge Reservation*, which Dr. Markiewicz has been working
22 with the ORRHES on for a couple of years.

23
24 Mr. Hanley asked if the group would like to take a few minutes during the meeting to follow up
25 on Mr. Lewis's recommendation. He expressed an interest in getting the subcommittee's input
26 on quick priorities in case ATSDR has to make adjustments.
27

28 Mr. Hanley noted that ATSDR has completed two PHAs. ATSDR has already prepared the
29 public comment versions of three PHAs—White Oak Creek radionuclide releases, off-site
30 groundwater, and the current and future chemical screening. The agency is currently responding
31 to comments received on White Oak Creek; it will be responding to comments on off-site
32 groundwater and will be releasing the current and future chemical screening soon. Regarding the
33 iodine PHA, there are some outstanding issues pertaining to uncertainty with the previous
34 analysis. ATSDR has an internal review draft of the PHA, which has already gone through data
35 validation. The data validation issues have been addressed, and the agency now has an internal
36 draft. This could be the next PHA released for public comment. For the K-25 uranium and
37 fluoride releases PHA, there are also some outstanding issues from the state's previous analysis.
38 Currently, ATSDR is addressing data validation issues on the K-25 uranium and fluoride PHA,
39 as well as on the PHA on polychlorinated biphenyls (PCBs). According to Mr. Hanley, Dr.
40 Taylor is making very good progress on the evaluation of past exposures to mercury, looking at
41 the dose reconstruction conducted by the State of Tennessee. Mr. Hanley said that he will obtain
42 Dr. Taylor's analysis before he leaves, and incorporate his section into the previous version of
43 the PHA on current exposures that was completed a while ago. Once this document has been
44 merged, it will have to go out for data validation and then through internal review before it can
45 be released for public comment.
46

1 Mr. Hanley asked the ORRHES what PHAs would have the most impact regarding community
2 concerns and outstanding issues that they think need to be addressed. According to Mr. Lewis, he
3 has argued all along that current issues are not of major concern for the lay public. He expressed
4 his belief that various agencies were handling current issues in an aggressive and professional
5 manner, and therefore were not of major concern. In his opinion, the city and Chamber of
6 Commerce might be interested in whether current conditions will have some impact, but they
7 have EPA and the state here to handle these things. He expressed his belief that they needed to
8 evaluate the past—which he said they have been arguing all along, as ATSDR knows. He
9 suggested that they focus on the past and concentrate on key items, contaminants, and PHAs.
10 According to Mr. Lewis, one of the saddest things was that they did not have a complete listing
11 of the community’s health issues and concerns at this stage in the process when they are shutting
12 down. Mr. Lewis indicated that most of the issues concern the past, questioning that ATSDR’s
13 products do not address what the agency came here for. He suggested separating the past from
14 the present, dealing with the past to focus on the key items here, and putting the issues into
15 categories for ranking purposes.

16
17 According to Mr. Lewis, cancer incidence and health issues are very important to this
18 community. He said he was not sure where this ranked. In his opinion, if current exposures could
19 be addressed somewhere else, they should be separated and given to someone else. He suggested
20 that ATSDR then go back and deal with the past issues, which would probably provide the most
21 benefit for the community. For clarification regarding current exposures, Mr. Hanley said, the
22 other agencies’ primary focus and goal is to address Superfund on-site cleanup. Whereas
23 ATSDR looks at things from a public health perspective and evaluates off-site exposures, these
24 agencies look at sites from a cleanup or regulatory perspective. Mr. Hanley said he appreciated
25 Mr. Lewis’s concern and interest about the past, but the present needed to be looked at and
26 considered to some extent: the state’s previous efforts focused on the past, so the present has not
27 been evaluated.

28
29 Mr. Hanley indicated that Mr. Lewis was right—there are some outstanding issues. In less than 6
30 months, he explained, the followup on the needs assessment (which Mr. Lewis has been asking
31 for) was completed. This included a review of all of the newspaper articles and documents and
32 extracting community concerns from them. Where appropriate, Mr. Hanley said, these concerns
33 will be placed into PHAs as they are prepared. According to Mr. Hanley, many of the concerns
34 were similar and were repeated in different documents. He said that ATSDR will address these
35 past concerns. Noting that the subcommittee members are in tune with the people’s issues and
36 concerns, he asked about their preferences regarding the PHAs. He asked if iodine or mercury
37 would be a priority, or whether the priority should be off-site groundwater (since it has not been
38 looked at extensively and they are receiving a number of concerns on the subject).

39
40 Mr. Lewis said that based on his limited knowledge, mercury, iodine, and Y-12 were the three
41 “heavy hitters” that he had heard most of the challenges about. He added that he was not sure the
42 Y-12 PHA had been done that well because there are some outstanding issues. He indicated that
43 there was much more expertise around the table than he had, and suggested getting guidance
44 from some of the technical people on how to prioritize the items that would be of most benefit to
45 the community.

1 Dr. Davidson pointed out that all of these have importance to some community members. Mr.
2 Lewis said he did not deny that. Dr. Davidson noted that they had a community member attend
3 work group meetings who was concerned about K-25, so those releases are on the list of
4 importance. They also had presentations on mercury in their meetings. She noted that PCBs are
5 ubiquitous—they have contaminated all of the country, not just Oak Ridge. Therefore, she said,
6 something will be found about each contaminant that is of high priority to a subgroup in this
7 community. As a toxicologist, she said, she could not prioritize one as more important than
8 another: doing so would mean taking the stance that one issue is more important to one group of
9 people than another issue is to a different group. Thus, they would not only be making a
10 judgment about resources, but also making a value judgment.

11
12 In his opinion, Mr. Lewis said, oftentimes looking at the concerns will drive you in a certain
13 direction, but ATSDR never put a list together to review. According to Mr. Lewis, the survey
14 from the dose reconstruction provided some guidance on what the issues and problems were. He
15 said that this survey was not done randomly, and that looking at it could provide a feel for the
16 issues. Dr. Davidson explained that other things have become issues since that time, such as
17 when they had a work group attendee talk about uranium and fluoride releases from K-25.
18 Regardless of what the dose reconstruction says, she stated, each one of these chemicals is of
19 interest to some subgroup of the community. (Mr. Lewis agreed.) But, she continued, none of the
20 issues will be of interest to all members of the community. She again questioned how they could
21 make a judgment that one is more important because it is more important to a particular group.
22 She expressed her belief that this was a difficult decision to make.

23
24 Mr. Box indicated that mercury was of concern, particularly because such a large amount had
25 been discharged from Y-12 and the Y-12 area. Mr. Box stated that barely a week passes when he
26 does not read a newspaper or journal article discussing another study on a different disease
27 possibly caused by mercury. For instance, there was an article relating Parkinson's disease to
28 mercury, and now innumerable studies are being conducted to ascertain if there is a connection.
29 Though Dr. Davidson might not agree, he added, it appears mercury is becoming a prime culprit
30 in many diseases in the public.

31
32 Mr. Hanley said that concerns have been collected in the Community Concerns Database
33 regarding mercury, and ATSDR has also looked at past concerns for issues that have come up.
34 He indicated that Dr. Taylor has been addressing some of these, while some others are addressed
35 in the current exposure portion of the document. He noted that mercury is often an issue in
36 connection to fish. In the document, he said, ATSDR will clarify how the type of mercury
37 released from Y-12 could have impacted people, adding that mercury is an important
38 contaminant. Mr. Box mentioned that steam plants emit quite a bit of mercury and the Oak Ridge
39 area is bracketed between two steam plants. Mr. Hanley indicated that this issue has been
40 brought up at meetings; Dr. Taylor is looking into it and it will be addressed.

41
42 Dr. Cember said he concurred with Mr. Box. When talking about interest to various segments of
43 the population, he questioned whether they were concerned about a perceived risk or a real risk.
44 He expressed his belief that the PCB risk is greatly exaggerated, noting that human data on
45 places where there have been exposures did not confirm fears. He said that the opposite is true
46 for mercury. In his opinion, he said, the Occupational Safety and Health Administration's

1 (OSHA's) Permissible Exposure Limits (PELs) are not enough to prevent mercurialism among
2 workers. He said he thought this had been demonstrated. Although there might be a great
3 perceived risk from PCBs, he expressed his belief that it is small compared to the actual risk
4 scientists have demonstrated from mercury. Dr. Cember added that mercury not only comes out
5 of coal, which contains reasonably large amounts of mercury, but it is also in newsprint. He
6 indicated that one of the main reasons he supports recycling newsprint is to prevent mercury
7 from being burned and released into the air. (He explained that mercury gets into the paper when
8 it is made: phenylmercuric acetate is used to inhibit the growth of mold on the rolls used to make
9 the paper.) Dr. Cember stated he had read somewhere that at least 90 percent of the nation's
10 supply of mercury went through the labs at ORR. He said he did not know the transmission chain
11 to get to people, so he was not sure how it was getting around or if it was isolated. He said he
12 would rank mercury as number one.

13
14 Ms. Adkins said that probably a month ago she would have said that mercury was the highest
15 priority, but she has since come to realize that they are not even touching the tip of the iceberg
16 here. According to Ms. Adkins, she went to the emergency room in the last month and was
17 alarmed to learn about the health effects of strange elements, such as thorium and gallium, which
18 she has never worried about before. She expressed concern that there are many elements in
19 people's bodies that they do not even discuss in their studies, stating that they either got these
20 from the moon or the nuclear facilities around us. In her opinion, Ms. Adkins said, there are
21 things they never discuss that are harmful and no one even knows to be tested for them. She said
22 she did not know where to begin.

23
24 Mr. Hanley explained that he is planning to incorporate an evaluation of past exposures into an
25 overall summary document. This past evaluation developed a list of contaminants, which
26 included those mentioned by Ms. Adkins. They were evaluated by the state a couple of times,
27 and ATSDR had experts look at them as well as other contaminants. Mr. Hanley indicated that
28 they needed to document that these substances were evaluated, and based on Ms. Adkins'
29 comments (as well as comments received before the meeting) they could explain the significance
30 of these contaminants. Before Ms. Adkins was on ORRHES, Mr. Hanley explained, they went
31 through the screening analysis of TDOH's efforts.

32
33 Dr. Malmquist agreed with what had been said, but noted that perception is also a fact of life in
34 what happens. He explained that he is one of the few members of ORRHES who uses the lake a
35 tremendous amount. In his opinion, PCBs are very important. He said that if they read over the
36 reports, they would see that PCB levels are dropping in all lakes except the Clinch River. In
37 addition, Watts Bar is one of the few lakes with warnings not to eat the fish. According to Dr.
38 Malmquist, if you go back to the state, the PCB levels are one reason for this. He said he hoped
39 that this would be dropped, but nonetheless, the perception is that this water is bad. He stated that
40 when they start ranking things and they have high levels of PCBs that are not going down in the
41 Clinch River, they had to ask why. He expressed concern that the perception is that this is
42 dangerous for this area. He said he did not know how to rank these either. He expressed his
43 belief that mercury is very important and causes all kinds of problems. He noted that he was in
44 Florida last winter, and people were told not to eat fish on the high end of the food chain, such as
45 swordfish, because they have high levels of mercury. He said that he did not know the perception
46 there, but that the perception here is that the lake water is bad, it is contaminated with PCBs, and

1 the Clinch River is the worst. He repeated that he did not know how to rank these, but that
2 something needed to be pointed out.

3
4 Tony Malinauskas explained that they had discussed a summary document, mentioning that he
5 strongly supports this. He asked whether it was off the table regardless of the funding situation.
6 Mr. Hanley indicated he was looking forward to releasing a summary document, but that it
7 would depend on funding. In his opinion, Mr. Hanley said, this document was important, but he
8 could not say at this time whether it would be produced. They would have to wait to hear from
9 senior management and know how much funding there would be to get this document out. Dr.
10 Malinauskas suggested adding the summary document to the PHA status table.

11
12 Dr. Davidson pointed out that they would finish their agenda even if they had to stay until 9 p.m.
13 Mr. Hanley indicated the importance of taking the time to discuss the priority issues Mr. Lewis
14 had brought up. Mr. Hanley said that this might be taking time away from some of the
15 presentations, but that maybe those could be made a little more quickly. Mr. Hanley explained
16 that he appreciated this time because ATSDR would have to make these decisions and bring
17 these issues to the forefront. Therefore, it was good to get their comments on the front end.

18
19 Ms. Adkins said she had a proposal for how to prioritize the use of limited resources. She said
20 that a group called Advanced Wellness has a thorough testing method that it uses to test people
21 for toxins. She said they test for about 20 different toxins, but do not cover the entire periodic
22 table. She suggested devoting resources to studying toxins that this company most frequently
23 finds in its patients. According to Ms. Adkins, Advanced Wellness documents everything it does,
24 and is very thorough and extremely cautious. This is the only company she knows of, she said,
25 that has studied people rather than fish. She expressed her belief that this would be an answer to
26 their concerns.

27
28 Mr. Lewis said he heard Dr. Malmquist and believed he understood what he was saying—the
29 PCBs are up and down the entire river. Mr. Lewis asked who was responsible for the signs, and
30 asked who was primarily responsible for the PCB releases—the state, the Tennessee Valley
31 Authority (TVA), or another entity. In his opinion, he said, their work should be about
32 addressing this issue to meet the needs of the people. To get anything out of this, he stated, they
33 had to pick based on what would benefit the community. He told a story about how the sign was
34 sitting at the river when he and some others went to baptize someone. According to Mr. Lewis,
35 the sign provided no information on where to go for details, such as a Web site. He indicated that
36 they need to look at what is out there and decide what to do; he said that someone has to make a
37 call. Mr. Lewis said Dr. Malmquist had a good point, but indicated that they could discuss PCBs
38 around this table pretty quickly, know where most of them came from, and discuss what they
39 could do to address the matter.

40
41 Dr. Davidson said she assumed they were discussing PHAs that are not almost finished or so far
42 in the pipeline that it would infeasible not to complete them. She expressed her belief that it
43 made no sense to not complete those that were almost done, noting that there were two or three
44 in this category.

1 Mr. Lewis asked whether iodine had been a major issue in the beginning of the program. He
2 stated that they had had enough of a fight on this topic to indicate that iodine was an outstanding
3 issue. In her opinion, Dr. Davidson stated, they could say that there were outstanding issues
4 involving all of these topics, which was the problem. Mr. Lewis recited a saying: "To treat
5 everything or everybody the same is to treat everything or everybody unfairly." He expressed
6 concern that they had to make a decision; if not, then people will get nothing and everyone
7 would be treated unfairly. He expressed his belief that mercury, iodine, and uranium were high
8 priorities. He asked what they could do to prioritize these, noting that key issues have been
9 challenged, including PCBs as Dr. Malmquist has mentioned.

10
11 Dr. Davidson said that ATSDR had heard their discussion. She indicated that ATSDR will have
12 to make its final decisions regarding what can and cannot be done with available resources. She
13 added that she would not want to be the one who made this decision. Mr. Lewis suggested that
14 subcommittee members meet to talk about this issue before they put it to rest to see if they can
15 come to a consensus before they leave. He noted that this could be their last meeting, and said he
16 highly recommended getting together in a small group to discuss this issue and determine
17 whether they could present something. Dr. Davidson asked the subcommittee members if they
18 agreed. Mr. Lewis suggested having a 15- to 20-minute break for discussion; Karen Galloway
19 said that was a good idea. Dr. Davidson stated that they would hopefully have this time available
20 at 2:45 p.m. for such a discussion.

Status of Assessment of Cancer Incidence

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22
23
24
25
26 Mr. Hanley noted that Mr. Lewis had mentioned the ACI for the eight-county area. The portion
27 of the original ORRHES recommendation has been developed, has gone through data validation
28 with the Tennessee Cancer Registry (TCR), and is currently undergoing ATSDR internal review.
29 According to Mr. Hanley, this part of the report could be completed fairly shortly and would be
30 submitted to TDOH's East Tennessee Regional Office. In addition, the report will be provided to
31 the Ad Hoc Work Group for discussion on how to make sure the information is in an
32 understandable form and to get feedback. Then the document will go out for public comment.
33 This report is on standard incidence ratios (SIRs) for all cancers with the eight counties from
34 1991 to 2000.

35
36 At the last meeting, Mr. Hanley said, ORRHES recommended modifying its original geographic
37 area because of problems with the census data. Since then, ATSDR has gone back to the state
38 and was able to obtain census tract data for Knox, Blount (part of geographic area), and Loudon
39 Counties. ATSDR has reviewed the data and discussed them over the phone with TCR staff; an
40 ATSDR statistician was also involved in that communication. Recently, the division director
41 from the Division of Health Studies (DHS), David Williamson, sent a letter to the director of
42 TCR identifying some issues that ATSDR was having with the data regarding census tracts. DHS
43 is looking to get a response to see if this can be done and if it is even advisable to move forward.
44 If this analysis cannot be done, Dee Williamson and her division director will come and discuss
45 this with community members, including the technical issues and difficulties regarding any
46 census tract analysis.

1
2 Mr. Hanley confirmed that Mr. Lewis had said in the past that the state has committed to
3 conducting a crude analysis by census tract in Loudon County; Mr. Lewis said this was correct.
4 According to Mr. Hanley, Dr. David Williamson said if the state can conduct this crude analysis
5 by census tracts in Loudon County, then ATSDR should be able to follow up with the
6 geographic area ORRHES developed and discussed many times over the years using SIR
7 analysis. Mr. Lewis said that ATSDR needed to talk to the state, but that the state had indicated
8 that it could look at the data at a lower level and had talked about census-tract type of
9 information or stratifying data. Mr. Lewis noted that he had not, however, said that the state had
10 indicated it could do this exactly at the census tract level: rather, the state had said it could
11 produce something other than the whole county and bring it down to the area of concern.

12
13 Mr. Hanley explained that the state had conducted a crude rate analysis last time using
14 information at the county level. The state had used this analysis to rank Loudon County against
15 all other counties in the state; the county was at the top for all cancers. Mr. Hanley explained that
16 this analysis was different from ATSDR's, which is looking at each cancer within a large
17 geographic area to see if any are elevated compared to the state. If any cancers are elevated,
18 ATSDR will quantify how much they are elevated (and put confidence intervals around them to
19 indicate its confidence in those quantifications). Mr. Hanley pointed out that this is a different
20 type of analysis, but if the state could evaluate data at the census tract level, then ATSDR will try
21 to work toward doing so as well.

22
23 According to Mr. Lewis, whether or not the analysis was crude, it failed to meet the community
24 members' needs. The community members need something that validates their perceptions, he
25 said: if he lives in this area and sees this all of the time, he wants to know if what he is seeing is
26 true and how it relates to the big picture. He stated that the public understands the crude analysis
27 and how things are elevated. He said that they could put something out that toxicologists might
28 prefer, but asked what they have done if the public cannot understand their results. Mr. Hanley
29 explained that crude rates are often used within agencies to help allocate resources and for public
30 health policy purposes. But there are limitations to crude analyses, which is why ATSDR is
31 using a SIR approach to address the issues that have been raised here. Unlike crude rates, the SIR
32 approach enables you to adjust for age, gender, and race.

33
34 Dr. Davidson added that by definition, a crude analysis does not give you much information
35 either. Mr. Hanley indicated that this was very appropriate for the state's purpose of developing
36 relative rankings. He expressed his belief that this was a first cut, and now the community
37 members are asking the state to do more. According to Mr. Hanley, it appears that the state will
38 follow up on the community's request. He said that the bottom line was that ATSDR will work
39 with the state to determine whether this area can be evaluated. If it cannot be done, regardless of
40 the budget, DHS has made the commitment to coming to town and discussing this. Mr. Hanley
41 noted that ATSDR will be contacting the ORRHES members via e-mail, letters, and other
42 means. Dr. Davidson said, it sounded as though the ACI requested of Dr. Dee Williamson by
43 ORRHES was a more refined assessment than the one done by the state for Loudon County. Mr.
44 Hanley agreed, noting that these were different types of analyses.

1 Ms. Adkins expressed her belief that this plan would be fine if time and money were not limited.
2 However, since they were, she said she felt it would be better to know if people had extremely
3 high levels of cadmium rather than waiting until they become kidney cancer statistics in a decade
4 or two. She reiterated her suggestion of using the remaining time and resources to look at
5 populations with high levels of heavy metals and toxin poisoning. According to Ms. Adkins,
6 there are ways to find people before they become a cancer or mortality statistic—a lot of this
7 information is available through Advanced Wellness. She indicated that more information would
8 be available if more people knew to get tested. Mr. Hanley thanked Ms. Adkins for her
9 suggestion and indicated that they would consider it.

Presentation/Discussion: Update on the Pre-Draft Final TSCA Incinerator PHA

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14
15 John Wilhelmi explained that he is a chemical engineer with ERG, a contractor to ATSDR. His
16 role in this project has primarily been to help ATSDR evaluate the public health implications of
17 the TSCA Incinerator. The goal of his presentation is to give a brief overview of ATSDR's
18 responses to public comments and peer review comments on the TSCA Incinerator PHA. Per Mr.
19 Hanley's request, Mr. Wilhelmi said, he had sent a copy of the responses to all of the ORRHES
20 members. He had also tried to e-mail them to everyone, but some of the e-mail addresses
21 bounced back. He had also sent them via FedEx to everyone on Tuesday. He said that most
22 people should have received a copy of the responses, but apologized to anyone who did not
23 receive them.

24
25 He showed an outline of the topics he would present, mentioning that he would focus most of the
26 presentation on discussing the overview of comments and responses. An overview map was
27 presented to show the location of the TSCA Incinerator, which was signified by a red dot. Mr.
28 Wilhelmi explained that if they drove from the meeting location, down the turnpike, and turned
29 right at Blair Road, they would see the incinerator. A photograph showed the incinerator, and
30 Mr. Wilhelmi identified the main stack. He indicated that usually you see steam coming out of
31 the stack, which mostly contains benign byproducts of combustion. Some trace contaminants
32 come out as well, though. The objective of the PHA is to determine whether local residents have
33 been exposed to unhealthy levels of contaminants released by the incinerator.

34
35 Mr. Wilhelmi presented a project timeline. He explained that he visited the former Public Health
36 Assessment Work Group (PHAWG), now known as the Exposure Evaluation Work Group
37 (EEWG), in March 2004. At this meeting, they discussed data sources that ATSDR had acquired
38 and assessed whether anyone had additional data sources for ATSDR to consider. In addition, he
39 said, this meeting gave him an idea of the community concerns, which he indicated were really
40 important in driving the focus of the PHA. Mr. Wilhelmi returned to the PHAWG in November
41 2004 to provide a preview of the findings. In January 2005, though Mr. Wilhelmi did not attend
42 the meeting in person, he spoke with the EEWG over the phone regarding a very specific topic
43 (review of emissions sources). In May 2005, Mr. Wilhelmi presented and discussed his findings
44 for the public comment release with ORRHES. Since this time, ATSDR has received public and
45 peer review comments; Mr. Wilhelmi was at this meeting to provide an overview of the
46 comments and responses.

1
2 Mr. Lewis stated that the community concerns section of this document was different from
3 others he had seen. It included an extensive amount of concerns, which to the best of his
4 knowledge had not been reviewed in any of their meetings. Mr. Wilhelmi said he could explain
5 where the list of concerns came from. Mr. Lewis indicated that he saw many community health
6 concerns in other documents that were technical, but this document contained many concerns
7 that were health issues. According to Mr. Lewis, this was an area where they had not done
8 anything. He asked where Mr. Wilhelmi obtained these concerns. Because Mr. Wilhelmi had
9 said these concerns were his driver, Mr. Lewis said, he would like to see them addressed. Mr.
10 Wilhelmi explained that section five or six of the PHA contained about 30 to 50 concerns and
11 responses.

12
13 As a scientist, Mr. Wilhelmi said, he has helped prepare many of these documents. He stated that
14 it is easy to get into the scientific mode and come up with something fairly technical, but this
15 might not serve the audience. He explained how he met with them early in the process to develop
16 a list of concerns, and also looked at newspaper articles to see what people were asking about.
17 He added that a list had been distributed at one of the PHAWG meetings, and that list continued
18 to be added to—the list in the PHA is what emerged from these efforts. Mr. Lewis recalled that
19 someone else had collected some of the concerns. Mr. Wilhelmi replied that he ran a query on a
20 database to obtain some of the concerns. In his opinion, Mr. Lewis said, Mr. Wilhelmi had also
21 run across some others and had a good compilation of issues. Mr. Wilhelmi added that he had
22 gone through these to see what the community was interested in, and then backtracked to see the
23 responses. Mr. Lewis repeated that he had never seen a set like these until this PHA, and wanted
24 to know where they came from and how they got into the PHA. He expressed his belief that Mr.
25 Wilhelmi had done a good job of addressing these issues.

26
27 Mr. Wilhelmi explained that the document review process comprised multiple rounds of review.
28 Initially, the document was reviewed carefully within ATSDR for scientific and editorial
29 comments. Next, the document went through data validation review, as is usual for these PHAs.
30 ATSDR also coordinated an independent peer review panel containing four experts in the field.
31 There was also a public comment period for the PHA, during which ORRHES contributed the
32 majority of the comments received. Mr. Wilhelmi said he had developed one summary statement
33 indicating that through all of the rounds of review, no comments suggested a conclusion other
34 than “no apparent public health hazard,” which he noted was a very important point. He said that
35 all of the comments really strengthened the document, noting that when you work on a document
36 so closely, you sometimes lose sight of things that might be important or might not be apparent
37 to people who have not studied the document’s subject in depth.

38
39 Mr. Wilhelmi divided the public and peer review comments into four different categories. He
40 said there were probably about a dozen editorial comments, such as using “of” instead of “or.”
41 All of these comments were incorporated. There were five general comments, which Mr.
42 Wilhelmi said were mostly favorable and reflected the fact that so many people contributed
43 throughout the process. There were 41 specific comments and minor clarifications, 10 comments
44 on methodology, and 11 comments on the conclusions and recommendations.

1 Mr. Wilhelmi provided some more information on the specific comments. Some requested more
2 detailed discussion of inputs, uncertainties, and interpretations of modeling studies that has been
3 incorporated into Appendix B. Some people asked about the public availability of certain
4 referenced documents, and the Web sites were included. One peer reviewer suggested having
5 more discussion on periodic thermal relief vent events or certain conditions that make it
6 necessary to shut off the feed and let out puffs of gas (not treated by air pollution controls). Mr.
7 Wilhelmi pointed out that the reviewer did not question the conclusion associated with this, but
8 just recommended dealing with the topic more thoroughly. One or two comments asked if all of
9 TDEC's data sources had been considered, which they had. Mr. Wilhelmi noted that he saw a
10 few statements in the text that could lead someone to think a few things had been overlooked,
11 and this language was clarified. There were questions regarding comparison values (CVs) that
12 were addressed.

13
14 One commenter did not like the use of "contaminant" and suggested using a softer, less
15 threatening term such as "substance." In his opinion, Mr. Wilhelmi stated, this would be masking
16 what really is out there. Mr. Washington asked if this comment was from one of the agencies.
17 Mr. Wilhelmi explained that it had come from one of four independent expert peer reviewers.
18 The reviewer expressed concern that using the word "contaminant" could lead to fear. However,
19 Mr. Wilhelmi said, using a softer word like "substance" to refer to toxic chemicals such as
20 dioxins is not fair either. Mr. Washington expressed his belief that this would be denying what
21 exists; Mr. Wilhelmi agreed.

22
23 Mr. Wilhelmi noted that the PHA focuses very much on inhalation exposures. While peer
24 reviewers said that this was entirely appropriate, they suggested making it more clear in the PHA
25 that this was the case. These changes were incorporated. There were also a few comments that
26 nearly implied that ATSDR was being too thorough and too protective. In his opinion, Mr.
27 Wilhelmi said, this is fine—it is the approach that ATSDR uses. He elaborated that the PHA
28 provides a detailed analysis of arsenic, cadmium, and chromium, which the reviewer indicated
29 might raise concerns where there were not any issues. He explained that the detailed evaluation
30 was mainly done because of the way that contaminants of concern (COCs) are selected. He
31 expressed his belief that this is stemming from the fact that the CVs are set so low that these
32 might have been COCs no matter where you were in the United States, which is true to a certain
33 extent. The comment was not, however, questioning the overall conclusion, but asking why the
34 PHA was going into so much detail for contaminants not originating from the incinerator. Mr.
35 Wilhelmi stated that he was fine with being too protective or too thorough in the analysis. He
36 would not, however, want someone to say he was cavalier in looking at the data.

37
38 Mr. Lewis applauded Mr. Wilhelmi for his work. In reviewing the PHA and looking at what was
39 done for the Kingston Steam Plant, he said that the concerns involving those three items jump
40 out at him.

41
42 Mr. Washington stated that it might mean something to the rest of the group if "no apparent
43 public health hazard" was explained. (Mr. Wilhelmi noted that the PHA's glossary defines this
44 term.) Mr. Wilhelmi explained that ATSDR has different categories for its conclusions. "No
45 public health hazard" means no one is exposed to any contaminants, and therefore no hazard
46 could exist if there is no exposure. "No apparent public health hazard" is the conclusion category

1 ATSDR uses when there is potential for exposure, but not at a level that would be expected to be
2 associated with adverse health effects. Mr. Wilhelmi explained that they have said all along that
3 the incinerator does release some contaminants. Most of the releases consist of benign
4 byproducts of combustion (steam and carbon dioxide), but there are some untreated chemicals
5 that pass through and are not collected by air pollution control devices. According to Mr.
6 Wilhelmi, the sampling and modeling data all point the same direction—amounts released from
7 the incinerator do not really rise to a level of public health concern.

8
9 Mr. Wilhelmi summarized the comments received on the conclusions and recommendations.
10 There was support for the main conclusion of “no apparent public health hazard.” One comment
11 suggested that ATSDR reconsider its specific recommendation to TDEC to use more
12 sophisticated lab equipment for analyzing some of its samples. This recommendation was
13 revised based on the comment to say that ATSDR encourages TDEC to verify DOE’s metals
14 sampling data through achieving lower detection limits or other means, some of which are listed
15 in the recommendation.

16
17 Mr. Wilhelmi summarized that they have been addressing the TSCA Incinerator for 1½ years.
18 Over 50 references were considered, tens of thousands of sampling results were evaluated, many
19 different studies were reviewed, and all of the subcommittee members’ input was received. He
20 indicated that there were three take-home messages. First, the guiding principle from the
21 beginning of the work here has come from an ATSDR Guidance Document on incinerators:
22 “Thermal treatment technologies [including incinerators] are inherently neither safe or unsafe;
23 whether they are safe depends on how they are designed and operated.” The second take-home
24 message referred to the main findings. Different independent lines of evidence were reviewed,
25 all of which pointed in the same direction. Mr. Wilhelmi presented a figure containing pillars,
26 and explained that this was a metaphor for the conclusion resting on these pillars. It was not a
27 case of one line of evidence—they were on firm ground. The third take-home message was that
28 there were three key points to consider. The incinerator has only been around from 1991 to the
29 present, and therefore it is close to being a state-of-the-art facility. It has a very sophisticated
30 process design and highly efficient air pollution controls. Mr. Wilhelmi said it was important to
31 remember that it was constructed at the time when strict environmental regulations were in place.
32 It has been studied extensively and regulatory agencies have said that the incinerator can operate
33 safely at a certain level of waste throughput. He noticed that throughout history, DOE has
34 operated the incinerator at a much lower throughput than that considered safe, even by
35 regulators. In Mr. Wilhelmi’s opinion, this was another reassuring point.

36
37 Mr. Wilhelmi said that even though they are at the end of the road for the PHA, DOE is still
38 required to do a lot of emissions monitoring and TDEC provides very extensive oversight. He
39 did not want people to leave thinking that ATSDR is responsible for all of this; DOE, EPA, and
40 TDEC have put many mechanisms in place to make sure these actions are safe. In addition, the
41 public health action plan in the document includes some recommendations that he would classify
42 as being fairly minor, including what should be done to continue to ensure that things are safe
43 and what to do about general air quality issues (not associated with the TSCA Incinerator’s
44 emissions). Mr. Wilhelmi said that their input has helped him make this a good health
45 assessment and that he had appreciated their input throughout. He wished everyone luck in what
46 happens here in the future. Dr. Davidson thanked Mr. Wilhelmi for doing a good job.

1
2 Mr. Box told a story about when he was doing work with the environmental division at X-10. As
3 they were going to the site and passing by pine trees that were turning brown, a representative
4 from the environmental division said, “There’s another result of the TSCA Incinerator.” Mr. Box
5 said that they were downstream of the incinerator, and asked if Mr. Wilhelmi had any comment
6 on whether there was destruction by the TSCA Incinerator or the pine beetle. Mr. Wilhelmi said
7 that this was addressed in the PHA: a study to evaluate this issue concluded that it was a result of
8 the pine beetle. He explained that the conclusion had to deal with how the harm to trees would be
9 expected to occur in a far more widespread area if it was truly the incinerator causing the harm.
10 Mr. Box said that he noticed extensive damage on the TSCA side of the road, but healthy trees
11 on the other side—directly across the road. He said he had mentioned this to the representative
12 who said it just had not gotten there yet. Mr. Wilhelmi replied that this could be possible, noting
13 that he had written one to two paragraphs explaining this in the section Mr. Lewis referred to
14 earlier.

15
16 Ms. Adkins said that they might laugh when they hear about the beetles, but expressed her belief
17 that disease is going to affect people with compromised immune systems. Regarding trees and
18 plants, according to Ms. Adkins, insects will go to weaker vegetation. Thus if a tree is already
19 damaged, it would be more prone to damage from pine beetles and other problems. She
20 expressed concern that they should not rule out danger from contamination in trees because pine
21 beetles attacked it. In her opinion, she said, they could blame this on the pine beetles, but there
22 was a reason why the beetles went to those trees instead of the ones across the street. Mr.
23 Wilhelmi said that she had a good point. He explained that he is not an ecologist and would not
24 go into much detail, but noted that he had reviewed a report prepared by an ecologist who had
25 studied this issue. He deferred to the experts in the field, he said, when responding to this
26 concern. Dr. Davidson added that pine beetles had also affected trees located nowhere near the
27 TSCA Incinerator. Mr. Wilhelmi said this was correct.

28
29 Ms. Galloway asked about a statement in the foreword to the PHA: “Any health threats that have
30 been determined for high-risk groups (such as children, the elderly, chronically ill people, and
31 people engaging in high-risk practices) are summarized in the conclusions section of this report.”
32 Ms. Galloway explained that she had looked in the conclusions section, but only saw children,
33 elderly, and people with respiratory illness or conditions; she questioned the part about “people
34 engaging in high-risk practices.” Mr. Wilhelmi explained that this is a standard foreword used in
35 all of the PHAs. Personally, he considers the category in question to include someone who could
36 be trespassing on a site and doing something that could bring him or her into closer contact with
37 a hazard than might be expected. He stated that he was not sure, however, what else the category
38 would include. Ms. Isaacs explained that it is sometimes more applicable to food-related issues,
39 such as when ATSDR is evaluating a subsistence fisherman who is eating something really
40 contaminated and the contaminants might be focused in the fat; in such a circumstance ATSDR
41 might recommend to clean the fish in a certain way. Another example would be a Native
42 American population that has certain practices that may make them more susceptible to
43 exposure. She too indicated that this was a generic foreword that does not sound really applicable
44 to this PHA. Ms. Galloway suggested removing this part since she did not see anything related to
45 it in the conclusions. Mr. Wilhelmi said this was a good point.

1 Mr. Lewis recalled reading one concern regarding Blair Road that said that most people are not
2 out in their yard all of the time. According to Mr. Lewis, no requirements prohibit people from
3 being in their yards, so one could conclude that it was high-risk behavior to play in your yard all
4 of the time. He said this statement bothered him—it was trying to identify worst-case conditions
5 around Blair Road. In his opinion, Mr. Wilhelmi said, high-risk behaviors are things a person
6 willingly chooses to do but should not be doing, such as trespassing. He explained that he has
7 worked at sites where people try to play with unexploded ordnance; to him that is an example of
8 an unadvised high-risk behavior.

9
10 Dr. Cember referred to the statement mentioning chronically ill persons. He said that a very large
11 portion of the population is suffering from diabetes and has suppressed immune systems. In
12 addition, he stated, a reasonably large portion of people have had organ transplants and take
13 immunosuppressant drugs. It seemed, he said, that they should have enough data on these people
14 to list them separately. Mr. Wilhelmi replied that this was a good point, but noted that the
15 screening process used for chemicals does have layers of conservatism and protectiveness that
16 hopefully account for some of the unique susceptibilities that people might have. Dr. Davidson
17 pointed out that they needed to have evidence that what you are doing would affect that specific
18 group in order to include it—for example, for air contaminants you might pull out asthmatics as
19 a particular group. Mr. Wilhelmi noted that this had been done in this PHA. Dr. Davidson said
20 that if you do not have this connection to show that population can be affected, then it is better to
21 be general. According to Ms. Adkins, some toxins affect glucose levels. Again, she
22 recommended looking at the contaminants that are inside people instead of looking at symptoms.

23
24 Mr. Lewis referred to the response on page 68 of the PHA regarding question B-2: “To what
25 extent do air emissions from other sources other than the TSCA Incinerator, particularly the
26 nearby power plants, contribute to local air pollution?” He complimented Mr. Wilhelmi on doing
27 a good job. Mr. Lewis said he defines this as “low-hanging fruit” because this is a sophisticated
28 process at a state-of-the-art facility. He had asked that the report put special emphasis on this, he
29 said; it was also recommended that they include comments about TDEC, EPA, and DOE to
30 indicate that they did a thorough job (similar to the comments ATSDR received on its report),
31 but he did not see this in the report. He expressed his belief that compliments should have been
32 given to these agencies that designed it and monitored it, and more emphasis should be put on
33 the controls in place. He expressed that he is still frustrated when he reads this because if they
34 went back to the minutes, he had wanted special emphasis on giving credit to the appropriate
35 parties and off ATSDR. Though he expressed his belief that Mr. Wilhelmi did an excellent job,
36 the report needed to put the emphasis on what is in place now.

37
38 Mr. Lewis referred to B.2, which showed the total number of pounds of air emissions from TVA.
39 In his opinion, it was these questions that gave him confidence about what the issues were in the
40 community. He expressed his belief that the way these concerns were addressed is how you
41 “sales and market” to concerned citizens. If he looked at this, he asked, what would he be more
42 concerned about? Regarding the recommendations, Mr. Wilhelmi agreed that they were “low-
43 hanging fruit”—minor things in the grand scheme. He explained that the recommendations were
44 made more in the spirit of assuring that the PHA did not overlook anything. According to Mr.
45 Wilhelmi, the fact that they had only minor recommendations was a testament to the work DOE,
46 TDEC, and EPA have done on the incinerator.

1
2 Mr. Lewis referred to a table that had come up many times during PHAWG meetings regarding
3 how the incinerator compares to other sources in the area. According to Mr. Lewis, TVA's
4 Kingston Steam Plant came up repeatedly. Mr. Wilhelmi said that he is always a little nervous in
5 responding because they are comparing apples to oranges to a certain extent, but nonetheless he
6 wanted to respond to the question that had been asked. He explained that this table compared
7 emissions that facilities reported to EPA's Toxics Release Inventory (TRI), assuming that
8 facilities reported the correct amount of toxic chemicals that were released for those they are
9 required to report. He said that "all of ETTP [East Tennessee Technology Park]" includes the
10 TSCA Incinerator, which was reported as 83 pounds.

11
12 According to Mr. Wilhelmi, when those releases are compared to releases from fossil fuel plants
13 in the area, the plants' releases are dramatically higher—upwards of 5 million pounds per year.
14 Mr. Wilhelmi explained that he is nervous about making these comparisons and mentioning them
15 in the text because most of the power plant releases are hydrochloric acid, which is relatively
16 benign in the grand scheme of things, while there could be 83 pounds of releases of very toxic
17 chemicals that could be of concern from the incinerator. He pointed out that these are
18 dramatically different sources, and various caveats are presented below the table in the
19 document. Another difference is that the power plant emissions are coming out of 500-foot-tall
20 stacks, which do not have lower emissions, but spread them over a larger area so they are a little
21 less concentrated when they hit the ground. The incinerator, on the other hand, has a much
22 smaller stack. Mr. Wilhelmi said that the genesis of this evaluation was a result of many
23 questions on this topic at PHAWG meetings. Mr. Lewis expressed his appreciation for Mr.
24 Wilhelmi doing this.

25
26 Mr. Lewis asked Mr. Wilhelmi to put up another table (Table 4), expressing his belief that
27 people were concerned about this. He asked what was happening back when the plants had low
28 stacks and were burning things in that area, noting that people have questions about this. He
29 indicated that this might not be directly linked to this site, but said that there is a direct
30 connection between what goes on down there and what went on during those years. In his
31 opinion, having these types of quantities laid out in this manner helps the public understand and
32 may be where ATSDR should focus its issues. He expressed his belief that the entire PHA was
33 "low-hanging fruit." He said if Mr. Wilhelmi had shown this table in the beginning of this
34 process, he would have suggested focusing on something else. He expressed concern that they
35 had spent a lot of time and agreed there were some questions, but he said it was beneficial to him
36 to know that you still did not see a problem when combining this with monitoring data. To him,
37 he said, this was the way to close something out. However, he stated, as soon as they go to the
38 past they do not have all of this monitoring data. He questioned the fact that they had to use
39 models for the past, but still came back using the same words: "no apparent." He expressed
40 concern that the conclusion does not have the same weight because health outcome data and
41 other things were not reviewed and combined.

42
43 In his opinion, Mr. Lewis said, Mr. Wilhelmi did an excellent job. He expressed his belief that
44 the weight of this conclusion is superior to that of the same health call made for the past. He
45 expressed concern that this is a problem that someone needs to look into so that the community's
46 questions can be answered. Mr. Lewis said he assumed that a lot of stuff had been dumped out

1 around here and in certain communities near the plants when the stacks were low and the coals
2 was being dumped out. He suggested going back and looking at the data. He expressed concern
3 that they were saying things were perfect, but this was not true. Mr. Lewis stated that the current
4 information looked good, but that the emphasis should be on the past. Ms. Adkins agreed. Dr.
5 Davidson expressed her belief that they were putting effort into addressing past issues as well as
6 the present. In her opinion, she said, you cannot compare the ability to look at past exposures
7 with the ability to investigate current exposures because you can only work with whatever data
8 you have for the past—you cannot go back and get more. However, the current analysis will
9 always be better because you have better data to work with.

10
11 Mr. Box noted that practically everyone heated with coal from low stacks in the 1910s, 1920s,
12 and 1930s; he questioned whether anyone has investigated correlations with some of the diseases
13 in that era. Mr. Wilhelmi explained that he had not personally studied this because the focus of
14 this PHA is on the incinerator that came into play in 1991. He explained that there are a lot of
15 historical data on “horrendous” air pollution episodes in London and other places (not Oak
16 Ridge) that have been associated with times when people were burning a lot of coal residentially.
17 There is a lot of this information in the literature, but it does not pertain to this PHA except in
18 that it shows these other sources do exist. As Mr. Lewis had said, all these sources are
19 everywhere, but having measurements of what is in the air reflects the contribution from
20 everything.

21
22 Mr. Lewis indicated that the PHA talked about what is carcinogenic and non-carcinogenic. He
23 said that they have all of this data to support why this is a non-issue—but people wonder about
24 20 to 30 years ago, when they had low stacks and things were being dumped out. He expressed
25 an interest in having this type of thing addressed in detail to assist the public in its understanding
26 of what they have been doing.

27
28 Dr. Cember explained that in 1900, when they had low stacks and dispersion of all of these
29 things, the infant mortality rate in New York City was 50 percent: one out of every two babies
30 died before the age of 1. The life expectancy was about 47 years, compared to about 77 years
31 today. He noted that there are many factors in this change, but air pollution controls are certainly
32 one of the factors. According to Dr. Cember, after air pollution controls went into effect in
33 Allegheny County in western Pennsylvania, there were measurable decreases in heart disease
34 and other health problems. (Mr. Washington noted that modern medicine also did a lot for this.)

35
36 Mr. Washington referred to some of the “bad actors” in the table Mr. Lewis had referred to. He
37 said that while Mr. Lewis might be right by saying he was pleased with the result, he stated that
38 he was not so pleased because he is very familiar with this subject. He noted that the incinerator
39 began operating in 1991, but DOE had tried to get a permit for much longer than that. He
40 indicated that something that kind of disturbed him was that—as Mr. Lewis had mentioned—
41 you could kind of derive your own result depending on the stack height. You get many more of
42 these things dropping around you when the stacks are low, he said. When the stacks are higher,
43 however, you do not know what it is doing to the adjacent communities. He said this was why
44 they had increased the height, adding that he was grateful that there is now a limit on stack
45 height to prevent this sort of thing. In his opinion, Mr. Washington said, they should tell people
46 here what was put into the incinerator. According to Mr. Washington, one thing the Oak Ridge

1 Site-Specific Advisory Board did was make sure (at that time) that they accepted no waste from
2 any other sites beside the Oak Ridge community because some of the waste was rather nasty. He
3 expressed concern that you notice some really “nasty actors” when you look at the dispersion
4 modeling for some of these contaminants, such as xylene and methylene. He indicated that the
5 ORRHES members might get a much better appreciation if Mr. Wilhelmi described what the
6 input materials were for the incinerator and where they came from.

7
8 Mr. Wilhelmi explained that certain sections of the PHA discuss this. He explained that this is a
9 hazardous waste incinerator that also treats radioactive waste. It is designed specifically for this
10 type of waste; it has appropriate air pollution controls, residence times, and other things to ensure
11 that it achieves necessary destruction of waste that can be destroyed or collects materials that
12 cannot be destroyed. Mr. Washington said he wanted Mr. Wilhelmi to say that nothing happens
13 to the radioactive waste—it does not burn or disappear. Mr. Wilhelmi said that the radioactive
14 waste is captured in the air pollution controls, noting that it is critical to know the types of waste
15 before designing the incinerator. He said that Mr. Washington was correct; there was a 4- to 5-
16 year period in which the incinerator did not operate. Primarily, the reason was that it had to be
17 demonstrated to regulators that waste could be treated without unacceptable levels of emissions
18 and with ample margins of safety. According to Mr. Wilhelmi, this was the reason it took so long
19 to get on board because these things had to be demonstrated with a level of confidence. There
20 was no doubt, however, that this was a hazardous waste incinerator, and it is monitored as such.

21
22 Mr. Lewis said he was not sure where the PHA was in the cycle, but asked when it was going out
23 or if ATSDR was waiting for comments. Mr. Hanley replied that it would be going final. Mr.
24 Lewis asked about the fact sheet that summarizes the PHA. He indicated that comments made
25 during a work group meeting had recommended noting that this is a state-of-the-art facility and
26 emphasizing what was seen as a good job by the other agencies. He stated that he was very
27 concerned about this because he did not like outstanding issues that imply that the agencies
28 might stop doing something that the law requires. In his opinion, he said, they need to indicate
29 that they were doing a good job in a summary statement or on the fact sheet. He stated that he
30 had not seen the final fact sheet yet, but said if they read those minutes they would know that the
31 group had argued enough about this. Mr. Wilhelmi explained that he still needed to provide Mr.
32 Hanley with the updated fact sheet. Mr. Lewis expressed his belief that it needs to be reviewed to
33 make sure the comments are reflected before it goes out. Mr. Wilhelmi indicated that he has a
34 copy of those minutes.

35
36 In response to Mr. Hanley asking if ATSDR ever compliments other agencies, Ms. Isaacs
37 explained that it would be appropriate to state when an evaluation shows that other agencies are
38 doing their job well, that things are being monitored in an appropriate manner, and that if these
39 things continue then ATSDR is confident in this. She said they could look at wording to use. Mr.
40 Lewis suggested referring to the comments they received from technical people about the great
41 job they had done. He clarified that they did not have to say something exactly like that, but they
42 should say something to reflect that ATSDR has no problem with what they are doing. Ms.
43 Isaacs replied that she has nuanced comments on other agencies when they have done a very
44 good job. She said they can express confidence that ATSDR does not foresee a problem if these
45 practices are maintained.

1 Ms. Adkins expressed her belief that this was a wonderful report from 1991 to the present. She
2 said she had the utmost confidence that everything is great and everyone is doing an excellent
3 job. However, she indicated that she did not want to leave anyone with the false impression that
4 everything is fine and has been fine. She expressed concern that all of the information prior to
5 1991 was probably from the Atomic Energy Commission (AEC) and DOE, which told people
6 where they could and could not test. According to Ms. Adkins, there are mysteriously
7 disappearing records that cannot be retrieved for unknown reasons. She said there are so many
8 holes in the past, but the few living people who have these toxins in their bodies are the only
9 source of information and therefore need to be looked at. She suggested somehow including a
10 comment that information from the past is highly impaired. She said maybe they will get people
11 to get tested to see if they have chemicals in their bodies rather than just thinking the government
12 says everything is alright. Mr. Wilhelmi said he wanted to be very clear about the incinerator: it
13 began routine operations in 1991, and was not routinely operating before then. He explained that
14 there are other sources in the area, which he assumed would be covered in other PHAs. He noted
15 that he has heard the point many times that what is in the body is of great concern and he
16 expressed his belief that other health assessments would look at this.

17
18 According to Dr. Cember, transuranic registries are a major and good source of these data. He
19 said these data are being held at Washington State University in the Hanford region, where they
20 do autopsies and analyses for all of these chemicals. He has received reports in great detail of all
21 the various chemicals found in the bodies of Hanford workers, residents, and so on. Therefore,
22 he stated, a lot of those data are available. Ms. Adkins expressed concern that it was a shame to
23 wait until someone is in autopsy or a cancer statistic; in her opinion, it would be good to know
24 ahead of time what your chances are instead of becoming a statistic or dying from cancer.

25
26 In reading the health outcome data portion of this report, Mr. Lewis said, he had seen that
27 ATSDR had done some work in this area to look at incinerators. He indicated that he was not
28 privy to this information and did not see a copy of the document being referenced. He asked
29 what kind of information was associated with this, what was going on, and what was found. In
30 his opinion, he said, having this information discussed and laid out in advance could have helped
31 Ms. Adkins and other ORRHES members with these questions. He did not recall any discussions
32 about this in their meetings, but now that they had a section and reference point for something
33 that had been done. He asked Mr. Wilhelmi to elaborate on this. Mr. Wilhelmi explained that
34 ATSDR has a guidance document on incinerators. As part of this effort, ATSDR looked through
35 literature on all past work at incinerator facilities to review health studies that had been done;
36 none were done in Oak Ridge. The PHA acknowledges upfront that its information is not
37 specific to this facility, but reflects what the literature says about some of the past studies.
38 Something from the National Research Council was also reviewed, he noted. Dr. Malinauskas
39 said that the reference is provided in the document. Mr. Wilhelmi indicated that it was a
40 guidance document for thermal treatment technologies.

41
42 Dr. Davidson asked if the four-page and ten-page summary fact sheets would be released in final
43 form along with the final release of this PHA. Mr. Hanley indicated that there was only a four-
44 page fact sheet. Dr. Davidson recalled discussing this fact sheet in a work group meeting, and
45 asked if ATSDR would let them know when it was ready to release it. Mr. Hanley said that they
46 would inform them before its release.

Work Group Reports

Dr. Davidson explained that Drs. Malinauskas and Malmquist had to leave early so they were moving up the Exposure Evaluation Work Group report.

Exposure Evaluation Work Group

Dr. Malinauskas said the work group met on September 12, primarily to discuss the comments collected and collated on the *Evaluation of Potential Exposures to Contaminated Off-Site Groundwater from the Oak Ridge Reservation* PHA. He expressed his belief that all ORRHES members have received these recommendations, and therefore he would not go through them as was done during the work group meeting. He asked if there were any comments associated with these recommendations. If there were not, he said, he wanted to formally transmit them to the chair and make a recommendation: ORRHES recommends that ATSDR address and respond to the ORRHES comments on the PHA for *Evaluation of Potential Exposures to Contaminated Off-Site Groundwater from the Oak Ridge Reservation*. Dr. Malmquist seconded the motion.

Dr. Davidson asked if anyone wished to discuss the recommendation. Mr. Gartseff said he did not have anything to raise in such a discussion, but that he had been unable to participate in the work group's discussion of these comments and recommendations; he had comments to add that may or may not have been discussed during the work group meeting, and he said he wanted to submit them to make sure they were part of what is considered by ATSDR. He also suggested a slight tweak to the recommendation to submit ORRHES recommendations as well as others that might come in from the public by the deadline (the day of the meeting). Dr. Davidson explained that other public comments are all addressed, so they did not have to deal with those. However, she asked if Mr. Gartseff had specific comments to submit on the document. Mr. Gartseff said he did. She asked him to tell them about his comments so they would know what they were adding, but said he did not need to provide a lot of detail.

Mr. Gartseff indicated that he had three pages of what he hopes are corrective criticisms. In general, he said he felt the hydrogeologic discussion is sketchy and the lay people are not likely to go to the source documents, much less understand them. In his opinion, he said, ATSDR would greatly enhance the document if it put forward several pieces of data so conclusions can be substantiated within the body of the PHA and be better understood. He suggested providing things such as vertical profiles or cross-sections of the site so people can see how stratigraphy and aquifers interact with each other at the different locations. The monitoring data come across to him as very selective; he said perspective needed to be given as to where the data came from, why those pieces were chosen for discussion, and so forth. He noted that he is familiar with some of these data and knows they are problematic in the sense of consistency, data quality, and other aspects, but suggested addressing this issue.

In Mr. Gartseff's opinion, there were issues that needed to be brought forth in the document; otherwise, it comes across to him as a very "summary-level" document. He indicated there was more to be said than "We think groundwater is going this way or not." According to Mr. Gartseff, the biggest issue is that of all the different concerns heard from the public, Ms. Adkins

1 (though he did not want to single her out), and others near her, this appears to be the closest to
2 environmental exposure that might have occurred. He said the document does not have to
3 specifically address that, but monitoring data are very close to the reservation and the possibility
4 of a data gap of further migration (in Ms. Adkins' case, to the west) needs to be explored a bit
5 more. He noted that the report does cite several references describing uncertainties about
6 groundwater flow and direction due to fractured bedrock.

7
8 Mr. Gartseff then said he had given the gist of his comments and asked who should receive them.
9 Dr. Davidson asked to hear a motion to include Mr. Gartseff's comments with the ORRHES
10 comments, and then deal with the main motion after receiving ORRHES approval. Dr.
11 Malinauskas stated that he had a problem with this because none of them had an opportunity to
12 review those comments. To make things easier, he suggested that Mr. Gartseff submit his
13 comments as a member of the public. Mr. Gartseff said he had no problem doing this. Dr.
14 Davidson indicated that they could handle his comments in this way.

15
16 Dr. Malinauskas said compared to the amount of comments on the TSCA Incinerator PHA, the
17 number of comments on the groundwater PHA is very small. Thus, if someone were happy with
18 the amount received on the incinerator document, they would be ecstatic with the groundwater
19 PHA—although, he said, Mr. Gartseff might call this into question.

20
21 There was no further discussion on the recommendation that ATSDR address these comments.
22 The motion passed with 11 in favor.

23
24 Dr. Malinauskas mentioned that he would like to receive the comments on the *Evaluation of*
25 *Current (1990 to 2003) and Future Chemical Exposures in the Vicinity of the Oak Ridge*
26 *Reservation* PHA by October 24. He said he would compile the comments, but was not sure
27 where they would go from there. He stated he could iterate by e-mail or via a work group
28 meeting (if they had one). Since Dr. Taylor will not be there and the office will be closed, Dr.
29 Davidson recommended that each individual submit his or her comments to Dr. Malinauskas,
30 who she asked to assimilate the comments. If they cannot have another work group meeting, she
31 said, Dr. Malinauskas should be prepared to bring the comments to the next ORRHES meeting
32 (hopefully they will have one) for discussion. Dr. Davidson asked if an e-mail could be sent out
33 to remind everyone of the October 24 date. Dr. Malinauskas said he could once his computer was
34 working. Dr. Davidson indicated that possibly Dr. Taylor or Ms. Horton could send out an e-mail
35 so everyone would have this date in written form.

36
37 Mr. Lewis asked about a point made by Susan Kaplan at the last ORRHES meeting regarding
38 core sampling at different levels in the area where there may be bands of mercury. He asked
39 whether there had been a recommendation on the table or anything said after her presentation on
40 how this issue would be dealt with. He asked if ATSDR was going to pick the issue up, and he
41 requested that it be on the record. Mr. Hanley said that it will be addressed; Dr. Taylor is
42 working on the issue.

Discussion of Priorities

1
2
3
4
5 Since he raised the issue of priorities, Mr. Lewis said, he had discussed it briefly with everyone
6 he could find during the break. He indicated that he might not be the best person to present this
7 information, adding that someone might have to help him. According to Mr. Lewis, there is a
8 concern about health outcome issues and health outcome data in the registries within the state.
9 He said they have been told that these registries are not the best; however, there might be some
10 things in the registries, such as cancer incidence and possibly birth defects. He explained that
11 they did not know what was in these registries, but the suggestion was to determine whether
12 there was anything in a formal register (such as birth defects) that has undergone quality control
13 (QC) and see if any of the contaminants could be looked at for a possible correlation. He said
14 they needed to try to connect ATSDR's findings as associated with exposure evaluations and the
15 contaminants there. He stated that they have been told that the state had started a birth defects
16 register (which was dropped); he asked whether this register might have picked up mercury as
17 maybe associated with birth defects and things of that nature.

18
19 According to Mr. Lewis, for existing things in registries, the suggestion was to prioritize those
20 that possibly linked to the QC data in the cancer register and try to focus on them so you could
21 have something to draw your conclusions from. He said this was the sense he got from the
22 discussion with other ORRHES members. Brenda Vowell said that there is no birth defects
23 register; there is only a cancer register that has been only about 80 percent cleaned.

24
25 Mr. Lewis indicated that this was something that they could work with and prioritize. He said
26 that Dr. Cember had mentioned mercury, and suggested taking this into consideration as part of
27 the effort to reach a general consensus. He expressed his belief that DOE had been concerned
28 enough about birth defects to start a register at one time, but the ball had been dropped. If DOE
29 felt it was important enough to put some money there, he said, then it was worthy to consider this
30 as part of their efforts. Mr. Lewis asked Mr. Hanley if this was something he would consider in
31 prioritizing the elements that they have to work with.

32
33 Dr. Davidson said that mercury was associated with birth problems and iodine 131 was
34 associated with cancer, but she said these were not included in registers.

35
36 Dr. Cember said he had been impressed that there was much more manganese than mercury
37 when Mr. Lewis showed the emissions from the various places. He expressed his belief that
38 manganese causes basically the same symptoms as mercury. For example, it can cause volitional
39 tremors in welders, tremors, memory loss, and possibly an increased chance of developing
40 Alzheimer's disease. According to Dr. Cember, three to four times more manganese was being
41 discharged than mercury. Therefore, he said, they would have to look at other substances that
42 would cause more or less similar symptoms.

43
44 Mr. Lewis indicated that he did not know what else to say. To him, he said, this is an outstanding
45 issue. According to Mr. Lewis, people have seen and read about health data, such as the report
46 provided to him by John Merkle from *The Oak Ridger* about cancer that was so broad. In his

1 opinion, he said, these types of things needed to be addressed for the public, and it would be
2 helpful to the public wherever they could make those types of correlations. Referring to articles
3 like this that have been presented in the paper, he expressed his belief that it was time to evaluate
4 available and updated data to determine whether any correlation exists between diseases and
5 these contaminants. If so, those contaminants need to be prioritized.

6
7 Dr. Davidson said she would need to do a more detailed analysis, but the only chemical she saw
8 that is really associated with cancer is iodine 131. She added that thyroid cancer is the only
9 cancer, but expressed her belief that it is not in the registry. Ms. Vowell and Mr. Hanley both
10 indicated that thyroid cancer is in the state's registry.

11
12 According to Dr. Davidson, mercury is associated with specific types of problems in women and
13 their offspring who have been exposed. Mr. Hanley explained that kidney effects and toxicity
14 might also result. In addition, he said, exposure to the organic form of mercury in fish is
15 associated with neurological problems. Dr. Davidson added that organic mercury is a really "bad
16 actor" for exposure of women during pregnancy. Mr. Hanley indicated that there is no registry
17 for kidney problems and those types of things. Dr. Davidson said that she usually thinks of
18 malformations when considering birth defects. She could not recall that mercury causes
19 malformations, but said it caused more functional deficits.

20
21 Dr. Davidson referred to uranium as far as exposure to radiation is concerned. Mr. Hanley said
22 that it would cause kidney effects; Dr. Davidson agreed. Dr. Cember asked if they were referring
23 to the element uranium or any of the specific radioisotopes. Dr. Cember said that, relatively
24 speaking, natural uranium is so non-radioactive that its chemical toxicity far outweighs its
25 radiological toxicity. Dr. Davidson expressed her belief that they were looking at both. Mr.
26 Hanley said this was correct. According to Dr. Cember, you would only start to theoretically
27 expect radiological effects when uranium is enriched and if it is enriched to more than 5 percent.

28
29 Ms. Adkins said that they are only guessing at this point. However, she stated, they had a chance
30 to get specific. According to Ms. Adkins, she has never worried about thorium or gallium and
31 has no friends who ever worried about these before, but she said you get concerned about them
32 when you find they are present at extremely high levels and working on your system. In her
33 opinion, she said, there are things they have not even talked about that they should possibly be
34 more concerned about. She expressed her belief that they could only know what their priorities
35 should be if they determined the most frequent toxin in people around them. She stated that they
36 now had a chance to do this. She stated that they had talked about the bureaucracy and how hard
37 it would be to involve this new information, but she did not see how in good conscience they
38 could not use documentation that might point them in the right direction. She added that, as she
39 understood it, cadmium causes kidney cancer. She expressed her belief that this is something
40 they did not talk about often, but a lot of people who have been tested have extremely high levels
41 of cadmium.

42
43 Dr. Cember pointed out that cadmium is present in cigarette smoke. According to Dr. Cember,
44 data from the Karolinska Institute in Finland found that the average smoker reaches about 50
45 percent of the acutely toxic level of cadmium in the kidneys—halfway up to places where the

1 kidney will start to bleed and be noticeably damaged. Therefore, he said, they need to be
2 concerned about smokers when they talk about cadmium.

3
4 If there was any way to work it out, Mr. Lewis requested that ATSDR use any leftover money
5 for trips to bring Dr. Cember to help them, even if they have to leave some people in Atlanta. Dr.
6 Cember thanked Mr. Lewis.

7
8 Dr. Davidson asked if there was a recommendation from the small group or just a discussion.
9 Mr. Lewis suggested prioritizing any data that have undergone a quality assurance/quality
10 control (QA/QC) review and from which they might be able to get a correlation. In addition, he
11 said, there may be some other data that could be picked up. He recommended listening to Ms.
12 Adkins and working with her to see if something could be used to help prioritize the list. Dr.
13 Davidson said she was not sure how to summarize this recommendation for the subcommittee.
14 Mr. Lewis said that they would request that ATSDR prioritize the COCs as associated with
15 formal disease registries that exist in the state. In addition, ORRHES asks that ATSDR interact
16 with Ms. Adkins and others who might provide links to other data that could be used to prioritize
17 the list. Ms. Adkins seconded the motion.

18
19 Dr. Davidson said she would not try to repeat the motion, but that the gist was for ATSDR to
20 prioritize the remaining chemicals based on disease registries. Dr. Cember noted that they heard
21 there were no disease registries other than for cancer, so this was a moot point. Dr. Davidson said
22 there is one COC—iodine—associated with cancer.

23
24 Ms. Adkins asked if they could use resources such as the March of Dimes, National Parent
25 Teacher Association (PTA), and other foundations that might have rankings. Mr. Hanley
26 explained that these types of data are not normally used because they do not undergo a QA/QC
27 as a cancer registry does and have not captured all of the cases. In addition, they are usually
28 missing data because they contain self-reported information or data obtained by reaching out to
29 certain public members. He noted that these data are hard to apply to this type of work. They are
30 good for helping organizations try to prioritize their allocation of resources into different areas
31 and different issues, but they are not appropriate for this type of analysis, which is associated
32 with chemical exposure.

33
34 Mr. Lewis noted that they are limited to the Tennessee Registry, which is viable, but questioned
35 whether there might be some correlation between other state registries, such as those for Hanford
36 and other sites. He suggested dealing with what they have here, but considering data available at
37 these other sites as next in line. Dr. Davidson expressed her belief that Mr. Lewis was basically
38 asking ATSDR to look at the literature to see what effects are related to these particular
39 chemicals. She indicated that they did not need databases to do this because the information on
40 effects associated with these particular chemicals is out in general toxicological and medical
41 literature. Mr. Lewis said he did not know all of the cancers. Based on her experience in studying
42 chemicals and associations of toxic effects with chemicals, Dr. Davidson said that you could not
43 take a disease registry from another state and superimpose it on this community. She indicated
44 that cancer registries do not relate chemicals to specific types of exposure; they only tell the
45 incidences of cancer in the particular areas they cover. If they wanted to associate chemicals with

1 particular types of exposure, then they would have to go to the epidemiological literature for
2 humans and available laboratory animal data.

3
4 Mr. Hanley suggested saying whether no registry exists, and indicating why something could not
5 be associated with a national registry if it could not be. Mr. Lewis stated that this would help, but
6 did not know what else to say. Mr. Hanley said that this subject could be clarified.

7
8 Dr. Davidson asked if they were ready to vote on the recommendation. Basically, she said, they
9 were prioritizing these chemicals based on disease registries. She pointed out, however, that they
10 only had one registry in Tennessee and iodine is the one chemical on the list associated with a
11 type of cancer in the registry. Ms. Adkins said that the recommendation also called for linking
12 this with data collected by Advanced Wellness on metal poisoning around this area.

13
14 Mr. Lewis indicated that he did not know exactly how to say it, but said he believed ATSDR
15 understood the spirit of what they were trying to do to identify wherever there are some
16 correlations, while also picking up Ms. Adkins' suggestion.

17
18 As Dr. Malmquist had pointed out before, Dr. Cember said, the perception is the reality.
19 According to Dr. Cember, some people have a perception of an enormously harmful effect from
20 some of these contaminants. For example, he said, people think that skiing is pretty safe, but it is
21 really an unsafe activity. Thus, the perception is the reality. In his opinion, he said, if they were
22 concerned with what the community was worried about, they would not rank these concerns only
23 by the physical effects in bodies because concerns might also have adverse mental effects. He
24 expressed his belief that this would be handled differently if addressed from a public health point
25 of view. In his opinion, he said, the concerns for PCBs are overrated based on what he has read.
26 Nevertheless, if PCBs are a high-ranking concern in this community, then they have to be dealt
27 with.

28
29 Based strictly on toxicology, her knowledge, and what she has heard from the group, Dr.
30 Davidson said, she would rank the documents in the following order: iodine, mercury, uranium,
31 and PCBs. She pointed out that this is not the only way of ranking as sometimes contaminants
32 are ranked by production volume. If they were going to put these in order of what has been
33 evaluated, Mr. Hanley asked about including fluoride, groundwater, and K-25 uranium, which
34 have not been addressed and evaluated. Dr. Davidson replied that she had not included these
35 because she would have thought they were so far in the pipeline.

36
37 Mr. Lewis asked if there was anything wrong with the list Dr. Davidson suggested, questioning if
38 anyone challenged it or agreed with it. Dr. Davidson pointed out that her list was also contingent
39 on the premise that the PHAs in the pipeline should be completed. In her opinion, there was no
40 reason to stop working on those other PHAs; her list prioritized the remaining four.

41
42 Dr. Malinauskas said he would put iodine lower on the list, expressing his belief that it is no
43 longer a public health concern. Dr. Davidson explained that it is a concern because people
44 exposed as children would be getting thyroid cancer now and in the future if iodine were an
45 issue. According to Dr. Malinauskas, there is nothing that you could do about that except to
46 provide care to those who have thyroid cancer, which is an easily curable type of cancer.

1 However, he said, something could be done about all of the others if they were of public health
2 concern.

3
4 Ms. Adkins said she would like to see how many people grew up in this community and went to
5 elementary school in Oak Ridge, Roane County, or the Morgan County area. She stated that she
6 did not know if others had the same experiences as her. According to Ms. Adkins, she was taught
7 early on that science is glorious and you should not disbelieve or doubt scientists who come to
8 the classroom and say everything is safe and you have nothing to worry about. She stated that
9 she believed this, and so did a lot of her classmates—many of whom are dead now. She
10 expressed concern that people do not know to be afraid of thorium, gallium, and other bizarre
11 elements because they are taught as children not to doubt or to be afraid. She indicated that they
12 are all arguing about what is more important according to opinion, but they did not have to use
13 opinions anymore because there are people who have gathered data on chemicals that are
14 actually in people's bodies. In her opinion, she said, they were doing a great disservice if they
15 close their books and say that everything is fine and these are the only things that need to be
16 worried about. She said they needed to use the available information to determine what has
17 poisoned people before they have to become statistics and some other committee forms in
18 another 20 years to look at the health effects from the ORR. She stated that they would be dead
19 statistics and that maybe they could be dug up for autopsies. In her opinion, she said, they were
20 failing if they did not use the available information while they have it.

21
22 Mr. Lewis said he wanted to withdraw his recommendation because Dr. Davidson's statement
23 has captured what he said and what Ms. Adkins is asking for. He asked Dr. Davidson to restate
24 her suggestion as a motion within this context. **Dr. Davidson moved that ATSDR prioritize**
25 **the remaining chemicals in order of iodine, mercury, uranium from K-25, and PCBs, and**
26 **also look at the data from Ms. Adkins to see if this information can be incorporated. Mr.**
27 **Lewis seconded the motion.** Ms. Adkins asked what was meant by the term "incorporated." Dr.
28 Davidson explained that this was requesting that ATSDR look at and evaluate the information to
29 see what data can be used. Also, she said, ATSDR would have to evaluate the data to determine
30 what could be done as far as rolling the data into a PHA. The motion passed with 11 for.

31
32 Dr. Cember asked what action ATSDR will take once it has this priority list. Dr. Davidson and
33 Ms. Adkins asked which information he was referring to. Dr. Cember said he was talking about
34 all of the information, indicating that the motion was valid but he questioned what ATSDR
35 would do with it. Depending on funding, Dr. Davidson said, she expected that ATSDR would
36 finish the PHAs in the pipeline and then prepare the remaining PHAs in the specified order of
37 priority.

38
39 Ms. Adkins suggested publishing a list of the toxins found in people's bodies through metal
40 screening to alert people that these things exist and require further study. Mr. Hanley said that
41 they have to look at the data she is referring to and determine how they could be applied. He
42 explained that there are many issues they must consider before something can be published, such
43 as what analysis was done, what kind of sampling was conducted, and whether sampling was
44 conducted before or after chelation.

1 Dr. Cember referred to International Commission on Radiological Protection (ICRP) publication
2 23, in which Tipton at the University of Tennessee analyzed cadavers that had many of the
3 elements listed there. He stated that it could be a good idea to see if what they find now is
4 different from what was found 30 or 40 years ago. Ms. Adkins asked where she could find that
5 information; Dr. Cember said it is published in ICRP 23.
6

7
8 **Presentation/Discussion: Public Outreach Plan for the**
9 **Assessment of Cancer Incidence**
10

11
12 Before they heard the public outreach plan for the ACI, Dr. Malmquist asked Ms. Isaacs if
13 ATSDR has enough money to implement the plan and go forward with it. He indicated that if
14 they had to choose between this and the PHAs, he recommended that they do the PHAs and not
15 be involved with getting the information out on the ACI. Ms. Isaacs explained that with the
16 uncertainties in the budget, the implementation of the plan might impact PHAs. She stated that if
17 the budget was sufficient, they would want to bring this issue to rest. However, she could not say
18 at this time whether this would not impact the PHAs.
19

20 Dr. Davidson expressed her belief that it was initially said that ATSDR would conduct the ACI
21 for the eight-county area. Ms. Isaacs replied that DHS has made that commitment; however, it
22 might become a matter of priorities if a more in-depth analysis is required. Dr. Davidson
23 indicated that the only other issue would be ORRHES involvement in the implementation of the
24 plan, because ATSDR already said DHS is committed to completing this. Though ATSDR might
25 not have the resources for ORRHES to be involved, she said, this did not mean that the plan
26 could not be implemented. Ms. Isaacs explained that they certainly have a commitment from
27 DHS to conduct some of the statistical analysis, barring any problems. The issue, however, is
28 whether money will be available to do some of the communications around this. Ms. Isaacs
29 continued that the plan includes many suggestions to reach out to the public, which involves
30 travel. She indicated that this was different from what DHS has already committed to doing as
31 far as the analysis; the communication of this work is somewhat uncertain. Dr. Davidson
32 suggested that they hear the plan: they might be able to identify things that could be prioritized.
33

34 Loretta Bush said she knew this committee has been looking forward to seeing the public
35 outreach plan for the ACI for some time now. In October 2004, she presented the concept based
36 on communications with various work groups to see what should be incorporated into this plan.
37 Last week, Mr. Hanley met with the Ad Hoc Work Group and the Community Concerns and
38 Communications Work Group (CCCWG) to present this draft plan. She indicated that this is a
39 draft document, and therefore it is subject to change based on additional comments received
40 from ORRHES members and TDOH officials.
41

42 She explained that her discussion would be about the communications aspect related to the ACI.
43 She referred to the overview of the plan, noting that citizens living in communities near the ORR
44 had expressed concerns about a perceived increase of cancer in the area. The purpose of
45 conducting the ACI is to give citizens within the eight counties information regarding the cancer
46 rates within each of the eight counties compared to the State of Tennessee rates. The assessment

1 will also be used to determine if any unusual patterns of higher incidence of cancers are
2 occurring within those eight counties relative to the state rates as well.

3
4 Ms. Bush explained that the plan was broken into six different phases based on comments
5 received in October 2004 and last week. She said she thought separate objectives and phases
6 were needed to incorporate the majority of the comments that had been received. She noted that
7 she wants their feedback and input, adding that the plan would hopefully be implemented as soon
8 as more was learned about the findings of the assessment.

9
10 Ms. Bush explained that the objective of Phase 1 is to obtain feedback from ORRHES, work
11 groups, and TDOH officials. She indicated that meeting with TDOH officials would be next, but
12 she had wanted to share the plan with them first and get their input. Certain people were
13 identified for ATSDR to share the plan with at TDOH, including Dr. Paul Erwin and Ms.
14 Vowell. In addition, Ms. Bush said that today Ms. Vowell had provided her with names of
15 additional people to consult with. In the next month, ATSDR will be meeting and speaking with
16 these officials to present this plan.

17
18 Phase 2, continued Ms. Bush, is when ATSDR will inform the public about this plan. She noted
19 that they had assisted ATSDR in the October 2004 meeting with identifying interested
20 organizations and environmental groups. Fourteen groups were identified, and government
21 entities within the eight counties were also suggested. The government entities include a
22 congressional delegation, state legislators, city councils, county commissioners, and boards of
23 health. In addition, ATSDR has an extensive list of churches, containing well over 500 in the
24 eight-county area. Ms. Bush noted that Ms. Adkins had mentioned that TDOH has a coalition of
25 churches, and Ms. Bush has made arrangements to meet with the coalition, which would bring
26 and share this information with area churches. She asked that ORRHES help ATSDR streamline
27 the churches within these respective areas where they would suggest conducting outreach,
28 adding that she definitely needed their input. According to Ms. Bush, some work members
29 indicated that ATSDR needed to be communicating this information out the field before the
30 report is released to the community at large.

31
32 Ms. Bush noted that during Phase 3, ATSDR wants to inform the public regarding dates, times,
33 and locations of various different meetings that the agency would like to hold. The plan is to mail
34 flyers announcing these upcoming meetings and also post information on ATSDR's and
35 ORRHES's Web sites. In addition, e-mail flyers will be sent to people on the LOC and ORRHES
36 distribution lists.

37
38 Ms. Bush explained that Phase 4 is part of the media outreach portion of the plan. ATSDR wants
39 to conduct media interviews with local media outlets. At the October 2004 meeting, ATSDR
40 received a list of media outlets within the area, and has since added the Dr. Bob [Overholt]
41 television show to the list as well as some of the local cable networks that cover city council
42 meetings. Dr. Malinauskas asked about the Hallerin Hill show, which he stated was a very
43 popular radio talk show. Ms. Bush said that this would be added. In addition, Ms. Bush
44 explained that she had contacted officials at the Dr. Bob show. She indicated that this is a
45 delayed program (not aired live), which is now actually taping for January or February. She said
46 she did not know if they could really make a time frame until they have a release date for the

1 report. ATSDR could still go on and present the information, but it would not appear the same
2 day that the information was actually presented there—it would be delayed 3 or 4 months down
3 the road.

4
5 During Phase 5, Ms. Bush said, ATSDR will send the press release to the media via the
6 Newswire announcing the (hopefully) upcoming ORRHES meeting and community education
7 sessions. She said that during discussions some people indicated they should hold a public
8 meeting to present the findings, while others felt community education sessions should take
9 place.

10
11 Ms. Bush said that the agency would bring in ATSDR individuals, but also invite other
12 representatives as shown in Phase 6, such as the American Cancer Society, American Lung
13 Association, Tennessee Cancer Registry, and the National Cancer Institute. These agencies will
14 be invited to the meetings to provide community members with additional resources, such as fact
15 sheets and flyers, and also assist with addressing specific questions that relate to particular types
16 of cancer. In addition, ATSDR plans to conduct media briefings in all of the eight counties and
17 will meet with government entities listed in Phase 1 to discuss the findings. Press kits that
18 discuss the plan will be sent to previously identified media outlets. The objectives of Phase 6 are
19 to provide information on who ATSDR is, why the agency is conducting the ACI, what the ACI
20 will and will not tell you, what study area was included, the ACI's limitations, and the findings
21 and conclusions of the report.

22
23 In addition, Ms. Bush stated, there were several people who provided comments on the plan at
24 the meeting last week. She thanked Mr. Gartseff for providing extensive comments, not only on
25 the flyer but also on the fact sheet. She recognized that additional work was needed on the flyer.
26 However, she noted it was in draft form, and said she would appreciate any additional questions,
27 concerns, or comments that could be provided.

28
29 Ms. Bush referred to the draft flyer, noting that the objectives in Phase 6 of the communications
30 plan were the same as the questions listed in the fact sheet. Though, the flyer also contained
31 responses to these questions. Ms. Bush quickly summarized the questions presented:

- 32
33 • What will it tell you?
34
35 • Why was it conducted?
36
37 • What was the study area?
38
39 • How were the data analyzed?
40
41 • What will the report tell you and not tell you?
42
43 • Can the ACI tell me the cause of cancer?
44

45 Ms. Bush asked the group to tell her if there were additional questions that could be added.
46

1 Mr. Lewis said that he had reviewed this and looked at it, but asked what it would take to get it
2 done. He expressed his belief that some consideration needed to be given to how it would be
3 presented, who the presenter would be, whether the presenter would be believable, and if the
4 presenter would be acceptable to the public. In his opinion, he said, it only takes one well-written
5 press release to get the attention of most people in this area. According to Mr. Lewis, they would
6 not have to worry about getting people to come as a general rule if the press release said there
7 would be an open town meeting and it were put out right. Mr. Lewis indicated that it is a
8 question of whether or not ATSDR is ready to answer the questions from the audience. He said
9 that they have discussed having an oncologist and some people are very comfortable with doing
10 that.

11
12 According to Mr. Lewis, Dr. Sinks indicated that CDC does this all of the time and has expertise
13 in handling these types of issues in communities. Mr. Lewis stated that Dr. Sinks explained that
14 they have a track record for dealing with these things, know what they are dealing with, and
15 know how to handle these situations. Mr. Lewis expressed concern that they only had one shot,
16 and suggested speaking to the experienced people Dr. Sinks was referring to and having them
17 review the plan and program. He suggested coming back with a sound approach that has been
18 proven because they did not have the time, money, or inclination to go through another failure.
19 In his opinion, this was the most important thing they could do. Mr. Lewis recommended having
20 Dr. Erwin, an oncologist, and people like Dr. Cember sitting on a panel instead of having a dry
21 speaker. He said they needed someone who could handle and field issues so people can leave
22 with some confidence. He indicated he did not doubt them, but based on what he has heard and
23 seen, he recommended incorporating someone with expertise in this area into the program.

24
25 During the community education sessions, Ms. Bush confirmed, Mr. Lewis was suggesting
26 having individuals on a panel to deal with questions coming from the audience instead of only
27 having ATSDR present the information as it relates to the findings of the report. Mr. Lewis said
28 this was correct. He suggested finding someone at CDC who has experience in dealing with
29 these types of things and knows how to field questions, and bring them to present the
30 information. He expressed his belief that they did not need to be how they have been in the past
31 when they have lost it. Ms. Bush expressed her personal feelings that DHS should present the
32 findings of the report. She said she had no objection to having different experts there to field
33 questions, but indicated she was not sure about having different people presenting information
34 that relates to DHS's report. Mr. Lewis indicated that they had one shot. He said he had seen
35 people who did not do the work present to make sure the information was conveyed to the
36 audience. In his opinion, they need someone who can capture the information, present it, and
37 fend off questions so the public can leave with what it needs. Mr. Lewis said he had shared this
38 with Dr. Falk and would call him back if this does not work. Mr. Lewis recommended that they
39 work this out internally, but asked them to bring a good professional program.

40
41 According to Dr. Davidson, the person who did the report knows the most about it. Thus, no one
42 in ATSDR or CDC would know the report as well as Dr. Dee Williamson. She indicated that
43 someone else could talk about it, but the audience would be able to tell the difference. Dr.
44 Davidson noted that she has been to many meetings where a person is presenting someone else's
45 work; in such situations, she said she felt the information is not as well or thoroughly presented,
46 or as well organized—the preparer knows more about it than anyone else. Mr. Lewis replied that

1 he had seen some nervous speakers who might be the most knowledgeable, but they lose the
2 entire audience because a heckler or someone else knows how to rattle them. In his opinion, a
3 balance is needed; they will lose if they did not have a person who is seasoned.

4
5 Dr. Davidson repeated her statement that only the person who prepared the report can present
6 that information and answer questions about the report: other people could be present to field
7 questions, but they would be setting themselves up for problems by bringing in someone who
8 had not been involved in creating the report. In her opinion, it does not matter how good the
9 speaker is if he or she does not know the information; knowing the information is most
10 important. Mr. Lewis said he had seen experts give dry runs of presentations and then be
11 replaced with people with general backgrounds because of their presentation skills. Mr. Lewis
12 suggested having the person there with someone else behind him or her in case someone gets
13 cornered. According to Mr. Lewis, the idea is to meet the needs of the audience no matter what it
14 takes. He said that Dr. Davidson might be right where she comes from, but he has seen it and
15 knows it can happen. In his opinion, this is crucial to this community. He said he had seen a good
16 example of this when watching Drs. Cember and Brent field questions and handle things. He
17 expressed his belief that they make people leave with an aura of confidence, even though they
18 had not prepared the report they were discussing. He indicated that this does not change what the
19 person has done, but he was asking that his point be taken into consideration.

20
21 Dr. Malmquist said he agreed with both viewpoints. In his opinion, he said, Dr. Dee Williamson
22 had to explain how she did the study, what the results are, and how she obtained the results.
23 However, he said, she is not an oncologist or a physician, and so they need one present to answer
24 the public's questions at the public meeting. He said that a question could come up about
25 whether something particular caused a high incidence; she would not be able to answer that, but
26 an oncologist would be able to explain why we cannot say what caused cancer. He indicated that
27 this was not Dr. Dee Williamson's job, but she could explain what the results were and how she
28 got there. He recommended having someone there to field questions that are going to come up.
29 Dr. Davidson agreed that other people should be there, but again expressed her belief that the
30 person presenting the report should be the person who prepared it. Dr. Malmquist agreed, saying
31 that Dr. Dee Williamson is very knowledgeable and can answer all of the questions about how
32 she came to those results, what the statistics were, and other questions. He suggested that they
33 have someone like Dr. Erwin on the panel saying he looked at the results and agrees with them.
34 Then this would not only be ATSDR presenting its results, but also an indication that TDOH
35 looked at the findings, agrees with them, and cannot find fault with them.

36
37 Dr. Davidson suggested having the people who conducted the Loudon County study present so
38 they can discuss the differences in interpretations and results between the two. She cautioned that
39 when they are looking at oncologists, clinicians are not necessarily always the best to discuss
40 cause and effect because their primary focus is treatment. Though what they do is important, she
41 said, they needed someone who is knowledgeable about causes of cancer.

42
43 Mr. Lewis recalled hearing a radio presentation by Paul Chorp in which Dr. Chorp said how far
44 something would go if it hit Topside Road. According to Mr. Lewis, sometimes familiarity with
45 a community and what is going on there can make a difference in how you get something across.
46 In his opinion, Mr. Lewis said, Dr. Malmquist's comments were right on the money. He

1 indicated that how you pick up and handle a question, even if it is irrelevant and unrelated,
2 makes a difference as to whether you get a buy-in or not. He said that they needed to make sure
3 this was in place.

4
5 Dr. Davidson asked what items on the plan would cost the most and the least in case this came
6 down to money. She questioned how they could look at this from that point of view. She
7 indicated that DHS had made a commitment to completing the ACI, and they might also be able
8 to implement some of these things even if not all of them because of limited funds. Ms. Isaacs
9 said she liked the suggestion about using someone with a background in causation because this
10 would not use up ATSDR resources if the agency can get CDC to make this commitment. She
11 said she had made a note of this and hoped they could identify someone who has a background
12 on causation of cancer within his or her normal work at CDC. If so, she said, this would be a win
13 for them; she indicated that they would definitely look into this. Ms. Isaacs identified staff-
14 related expenses as the most costly, including traveling to make presentations. She noted that it
15 would be great if they could find ways to make presentations without traveling, such as making a
16 DVD as a resource to distribute without the person actually appearing at the meeting. She said
17 this was something they could certainly consider if the final information on funding is negative.
18 She indicated that suggestions along these lines and advice on prioritizing the PHAs are very
19 beneficial. It would also be very valuable for the agency to still meet as many of these outreach
20 objectives in a more economical way.

21
22 Dr. Davidson asked whether one well-done, televised public presentation could be used instead
23 of other personal presentations. Ms. Isaacs indicated that this would help, particularly with the
24 uncertainty of funding. According to Ms. Isaacs, the part of the plan that lists the presentations
25 ATSDR will make causes the most concern. Dr. Davidson said they could look at this from the
26 standpoint that they could probably do at least one presentation. Ms. Isaacs replied that they
27 would do their best.

28
29 Mr. Lewis said he had asked the state how it drew 100 people to a meeting; the state replied that
30 it had put the draft report on the Web site, the press had gotten a hold of it, and the way it was
31 written up had gotten everyone's attention. In his opinion, Mr. Lewis said, they sometimes
32 customize things to the point where you pick something up and cannot figure out what it is
33 talking about. He said they might be technically right, but they have to say things so that people
34 can understand them. In his opinion, he said, if they draw people in, even if they come in with
35 the wrong perceptions, you can clarify and go from there. He indicated that they needed to do
36 whatever it takes to reach the people. He expressed concern that the press releases have been
37 really weak and shaky and have not met the needs of the people. Thus, he said, ATSDR ought to
38 do this one to the best of its ability.

39
40 Referring to Phase 1, Ms. Vowell said that TDOH has videoconferencing so they could get
41 everyone together while saving on travel. Ms. Isaacs said this was a good idea, noting that
42 ATSDR also has this capability. Ms. Vowell replied that TDOH does a lot of CDC
43 videoconferencing.

44
45 Dr. Davidson asked if the CCCWG had a recommendation on this. Mr. Gartseff replied that the
46 work group had a recommendation, but it was not about this specifically. He said this

1 recommendation had first been proposed on August 29, which was the meeting before Mr.
2 Hanley came to present the draft communication plan. At the time, according to Mr. Gartseff,
3 Mr. Lewis seemed to feel strongly that they needed to have a better picture of the product before
4 discussing and approving a communications plan about that product. Mr. Gartseff said he saw
5 the recommendation printed here, which appeared to come verbatim from the draft minutes,
6 though he had wordsmithed it for today's meeting. The gist, he said, was that the work group
7 wanted to recommend to ORRHES that ATSDR bring Dr. Dee Williamson to discuss the
8 product before they could intelligently discuss the communications plan. The motion passed two
9 to one. In view of today's discussions, however, this may or may not be germane at this point.
10 Dr. Davidson asked if Mr. Gartseff wanted to put this recommendation on the table or withdraw
11 it since they have already discussed the plan. Mr. Gartseff stated he would hand this over to Mr.
12 Lewis since it was his recommendation.

13
14 Mr. Lewis stated that he was not sure what to say since they might not be having another
15 meeting. He expressed his belief that they needed something in writing from Dr. Dee
16 Williamson. According to Mr. Lewis, they have been arguing about the definition of plumes and
17 census tracts, but never received anything officially to assure them of what this product would
18 look like. In his opinion, he said, something like this could be helpful since they might not meet
19 again; he was not sure if it mattered, though. Dr. Davidson pointed out that Dr. Dee Williamson
20 might be ready to present this document if they meet again. Even if they get funding, she said,
21 they did not know when the next meeting would be because it would depend on scheduling.

22
23 Mr. Gartseff explained that when they first discussed this motion at the CCCWG meeting, he
24 could see Mr. Lewis's point and interest. At the same time, however, he could see how this
25 recommendation would simply delay the process. Though this is speculative, he would rather get
26 the product than have more discussion and wait longer for it. He said he would prefer to
27 withdraw the recommendation, provided that Mr. Lewis was comfortable with that suggestion.
28 Dr. Davidson mentioned that David Johnson had also been at that meeting.

29
30 Mr. Lewis indicated that his only fear about withdrawing this recommendation was that they do
31 not know what the community wants. According to Mr. Lewis, the presentation in Loudon
32 County did not meet the needs of that community and the people challenged the state to go look
33 at a lower level. He expressed his belief that they have been debating this and ATSDR said it
34 was capable of doing this. In his opinion, he said, something should be e-mailed or sent to let
35 them know what they will be getting so they do not get to a meeting expecting something
36 different. He suggested providing them with this information, not in a formal presentation, but by
37 some means so they know what to expect and why things were not done (if they were not). He
38 repeated that it would be helpful to know what they will be facing when they show up.

39
40 Dr. Davidson said they could probably ask ATSDR to send an e-mail to all ORRHES members
41 letting them know what parts of the ACI will be done, which could serve as a formal response to
42 different aspects of the recommendation. According to Mr. Hanley, if Dr. Dee Williamson and
43 the rest of the DHS staff decide this cannot be done, they will come to explain exactly why they
44 cannot do the census tracts. Dr. Davidson pointed out that they might not be meeting again, and
45 that if they were meeting they did not know when. Mr. Hanley said that they were nonetheless

1 willing to come up—it would not necessarily be at an ORRHES meeting, but DHS will come
2 and discuss this with anyone who is interested.

3
4 Mr. Lewis noted that if they invited people from Loudon County, they needed to make sure they
5 did not conflict with what was being done for that area. He expressed his belief that if they
6 conflicted, ATSDR would look silly because even if what they are doing in Loudon County is
7 crude, it might meet the needs. Mr. Lewis cautioned ATSDR to make sure what it is doing comes
8 close to what they have been asking for. He said they needed to look at this and see how it might
9 be beneficial even if it is crude.

10
11 Mr. Hanley said he believed Mr. Lewis was saying that what was received in Loudon County
12 was not to the level the people wanted, and that they were requesting additional details.
13 According to Mr. Lewis, they had indicated that going down to a lower level would help them
14 better deal with the issues. Mr. Lewis suspected that they will have the same question here about
15 “What happened in my backyard?”

16
17 Dr. Davidson clarified that they would not be discussing the report per se, but discussing parts of
18 the report and why they were not doing certain things (if they were not). Mr. Hanley said this
19 was correct: if they cannot get down to the census travel level, then DHS will explain this.

20
21 Dr. Davidson pointed out that there was no motion on the table, as Mr. Gartseff had withdrawn
22 the CCCWG recommendation. Mr. Gartseff said he had expressed a preference to withdraw it.
23 Dr. Davidson noted that there were no objections heard; Mr. Gartseff withdrew the motion.

24
25 Dr. Davidson referred to the communications plan, indicating her perception that the first priority
26 is to implement the plan with at least one meeting. A DVD will be made of this meeting and
27 distributed throughout the eight-county area. Mr. Lewis expressed his belief that the priority
28 should be to get as much public participation in that meeting as possible.

29
30 Mr. Hanley explained that the point of this plan is to reach more people. They are trying to do
31 this by finding out which organizations are interested in these topics in advance, then going to
32 them at their regularly scheduled meetings. According to Mr. Hanley, they would deal with
33 people in smaller groups and could get answers to their questions in an environment they are
34 comfortable with. He indicated this was a way to reach out to more people, but they might not
35 have the funds to do this because it could be over 2 weeks of meetings. Thus, they might have to
36 go to one meeting with a DVD. Mr. Hanley said they could bring in someone to help facilitate
37 and present the material, while also having other people such as Dr. Erwin (as Dr. Malmquist
38 mentioned) and the support of other agencies (such as TCR, TDOH, and others). Mr. Lewis
39 indicated that this was basically what they had said.

40
41 Dr. Cember expressed his belief that it was a good idea to have a local physician’s group because
42 this all deals with health, but he did not see any listed here. Ms. Bush noted that the Boards of
43 Health was listed. Dr. Cember said he was thinking of the American Medical Association
44 (AMA) or an equivalent organization, because ordinary people do not come in contact with the
45 Boards of Health; they come in contact with doctors.

Additional Comments

Mr. Lewis asked if there was any way for Dr. Taylor to come back and make a presentation on mercury. Ms. Isaacs said she did not know. Mr. Lewis requested that she look into this because there is a lot of confidence in him. According to Dr. Davidson's comments, he said, Dr. Taylor would be the best person to present since he did the report. Dr. Davidson replied that her graduate professor always said that no one knows more about what you have done than you do.

Presentation/Discussion: Evaluation of Current (1990 to 2003) and Future Chemical Exposures in the Vicinity of the Oak Ridge Reservation

Dr. Markiewicz said that all ORRHES members should have received a copy of this document in the mail. The current time period for this PHA was defined as 1990 to 2003. A figure detailing ATSDR's chemical screening process was presented. Dr. Markiewicz noted that there were three similar figures in the document, but this was a generic diagram showing how the agency screens chemicals down to the public health implications portion of the document. Early in the process, ATSDR walked through each of these steps when evaluating soil, sediment, surface water, and biota. The figures were used to illustrate the generic screening process as well as what was done in this specific case, showing the chemicals that went through the screening process and those that screened in and out.

In the first phase of the chemical screening process, ATSDR screens against media-specific CVs known as environmental media evaluation guides (EMEGs). There are different types of EMEGs for soil, surface water, groundwater, and air. He indicated that commenters have asked about ATSDR's use of the term "conservative." In the first phase, he pointed out, ATSDR compares the maximum detected concentration to screening values. He identified this as one step of a conservative or health protective measure because any maximum detection that falls below the screening value could be screened out. Therefore, because you are looking at the maximum detected concentration, it could be said with reasonable certainty that this is not going to be at a health effect level.

According to Dr. Markiewicz, this covered a wide area and there were a high number of samples for much of the media. Exposure pathways are considered next in the screening process to identify those that are valid. Then, exposure doses are calculated and certain refinements are carried out. Then, exposure dose concentrations are estimated, and anything that comes through this process is included in the public health implications portion of the document. In this section, ATSDR looks at the existing data, the particular media, and the exposure scenario to determine the likelihood that adverse health effects could occur.

Dr. Markiewicz presented a map of the area of interest from the PHA titled *ORRHES Area of Interest*. He also noted that a map in the PHA shows all of the sample areas and identifies the different media where samples were collected throughout.

1
2 TDOH stopped its evaluation in 1990, so ATSDR went from 1990 to 2003 for its evaluation. Dr.
3 Markiewicz said it is important to note that this PHA only deals with chemical exposures and
4 certain chemicals. It does not include exposure to mercury, PCBs, uranium, iodine 131, the
5 TSCA Incinerator, off-site groundwater, and White Oak Creek radionuclide releases; these are
6 all covered in separate PHAs.

7
8 For each medium, ATSDR had the following approximate number of records:

- 9
10 • Soil: 10,000
11
12 • Sediment: 56,000
13
14 • Surface water: 93,000
15
16 • Biota:
17
18 o 16,000 (fish)
19 o 2,200 (game)
20 o 236 (vegetables)

21
22 ATSDR typically evaluates all media, but groundwater is included in a separate PHA. Dr.
23 Markiewicz explained that the PHA includes a discussion of the limitations of some of the
24 specific data, whether for a specific type of biota or a specific compound (such as dioxins).

25
26 He said he wanted to point out that the Director of Science had questioned the second-tier
27 screening value approach used in this document. When calculating exposure doses, one often
28 considers the average (arithmetic or geometric mean). In this PHA, however, ATSDR took one
29 standard deviation above the mean instead of using average concentrations. Thus, the calculated
30 exposure doses for this part of the screening include numbers that are higher than the average,
31 which is a health-protective measure. By using this approach, he said, they would capture
32 anything that may not have screened in or out when using the average.

33
34 Regarding how screening values are derived, Dr. Markiewicz reminded the group of a
35 thermometer graph he had previously shown. He explained that the graph detailed where health
36 effects have occurred based on animal and human data and showed where the screening values
37 are. The graph had typical exposure doses that were calculated for different sites used to provide
38 examples of the margin of safety, demonstrating that screening levels have built-in safety factors.
39 He explained that the screening values used are not health effect values, but values used to bring
40 whatever chemicals do not pass into further evaluation. However, he said, because of the large
41 margin of safety, a chemical above a value will not necessarily cause health effects. Typically,
42 the margin of safety is between 100 and 1,000, but it could be 300, 10,000, or something else.
43 According to Dr. Markiewicz, how much of a safety factor depends on how much confidence
44 there is in the data set.

1 Dr. Markiewicz provided summary statistics for soil, sediment, surface water, biota, and air,
2 which are provided below.

3
4 *Soil:* The maximum concentrations of 22 chemicals exceeded CVs (soil EMEGs). Four of these
5 chemicals—arsenic, benzidine, iron, and lead—had exposure doses above screening guidelines
6 (i.e., the minimal risk level, or MRL). These four chemicals were carried through to the public
7 health implications section.

8
9 *Sediment:* The maximum concentrations of 33 chemicals exceeded CVs in sediment. None of
10 these chemicals, however, had exposure doses that exceeded screening guidelines (MRLs).

11
12 *Surface water:* The maximum concentrations of 75 chemicals exceeded CVs. However, using
13 one standard deviation above the mean, zero chemicals had exposure doses that were above
14 screening guidelines.

15
16 *Biota (fish):* According to the average of the maximum by species, there were 12 chemicals
17 above CVs. Primarily, these fish species included sunfish, catfish, and bass. ATSDR took the
18 average of the maximum and grouped the data by species to see if any were above screening
19 values. ATSDR used this approach instead of only looking at one maximum because some
20 people only eat certain species and fish have different behaviors in the environment. Six
21 chemicals had exposure doses above screening guidelines for both East Fork Poplar Creek and
22 the Clinch River. Eight chemicals had exposure doses above screening guidelines for Watts Bar
23 and also for “on-site fish.” These on-site fish were included because some people may be able to
24 get in and fish in the areas considered on site, and also because fish can move to different areas.

25
26 Mr. Washington asked if ATSDR had specified species relative to the area. Dr. Markiewicz said
27 it had. Mr. Washington asked if bottom feeders and PCBs had been considered. Dr. Markiewicz
28 explained that the PCB PHA contains a diagram and a picture on that subject. He said that he
29 was writing two PHAs at the same time, noting that the PCB PHA talks about the different
30 species. He indicated, however, that it would be a good idea to pull that into this document as
31 well: it is germane for the PCB PHA because fish are a critical pathway for PCBs, but it would
32 also help to have that information in this PHA since it also deals with fish.

33
34 *Biota (game):* Off-site game were below CVs. However, according to the average of the
35 maximum, eight chemicals were above CVs for on-site game. There were seven chemicals with
36 exposure doses above the screening guidelines. There are certain game species on site, including
37 turkey, deer, and waterfowl.

38
39 *Biota (vegetables):* According to the average of the maximum, three chemicals were above CVs
40 and three exposure doses were above screening guidelines.

41
42 *Air:* Three chemicals had maximum concentrations above CVs. These include arsenic, cadmium,
43 and chromium. A total of six chemicals were looked at, as ATSDR had more limitations on the
44 air data.

1 Dr. Markiewicz explained the public health implications regarding children's health
2 considerations. When ATSDR goes through the screening process, the public health implications
3 section is broken into two areas: a section on children's health considerations (to take the more
4 susceptible population into account) and then more of a health evaluation. Under children's
5 health considerations, ATSDR looks at a pica scenario. Soil-pica behavior is when a child
6 exhibits an abnormal appetite for nonfood items, such as soil. Arsenic, iron, and lead were three
7 chemicals that did not pass the screening criteria, so ATSDR had to look at them in greater
8 detail. ATSDR used the maximum concentration with conservative assumptions for pica,
9 considering 52 exposures with one exposure per week for 3 years. According to Dr. Markiewicz,
10 most pica children are within a certain age range and typically are not outside 52 weeks a year—
11 particularly in this part of the country, given the inclement weather. However, ATSDR finds
12 these default assumptions to be health-protective because they consider the maximum default
13 assumptions and keep a child at 10 kilograms over 3 years. When doing calculations and looking
14 at pica doses, they are evaluating a milligram of a chemical per kilogram body weight per day. If
15 the body weight remains the same, this will overestimate this type of exposure.

16
17 For arsenic, pica behavior at the maximum detected level could cause effects. No effects were
18 expected based on pica behavior for iron, but pica behavior at the maximum lead detection could
19 elevate the blood lead level (BLL) above 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$). In addition,
20 ATSDR made sure that the highest level was in an area where pica behavior could occur. For
21 instance, many of the detections were at the Atomic City Parts Superfund Site where soil has
22 been removed and it is an industrial area; therefore, pica behavior would not be likely here.

23
24 Arsenic was detected at 77.3 parts per million (ppm) in a yard on a residential property. This
25 concentration was used in the calculation for pica behavior. Based on this and assuming 100
26 percent absorption (i.e., that 100 percent of what a child ingested will get into the child's body),
27 acute health effects from arsenic could be seen if pica behavior occurred at the maximum
28 detected level. These acute effects typically include gastrointestinal distress, such as vomiting,
29 diarrhea, and possibly facial edema. The effects are painful, but do go away—there are no long-
30 term effects. Once again, he said, a child would have to be exposed to the maximum level and
31 have 100 percent absorption.

32
33 Mr. Washington asked if the level in question had been found in a yard in Oak Ridge. Dr.
34 Markiewicz said it had. He explained that there were many past uses of arsenic, and
35 bioavailability could be higher depending on what the use was. For instance, pesticides,
36 herbicides, and defoliants have a higher bioavailability than something from a smelter-type
37 activity. ATSDR assumed 100 percent bioavailability, but the range of arsenic is between 10 and
38 80 percent depending on the actual source of arsenic.

39
40 Mr. Washington pointed out that arsenic is also present in rat poison. Dr. Markiewicz said this
41 was correct.

42
43 Dr. Markiewicz said he had found a contradiction in the PHA regarding iron that will need to be
44 changed: the document refers to iron as the "second most abundant element" and also the "fourth
45 most abundant element." Despite this, he said, there is still iron deficiency anemia in our society.
46 The body can handle iron—it has a certain regulatory mechanism that excretes more if you get

1 too much and absorbs more if you do not have enough. Given this and other parameters, ATSDR
2 expects no adverse health effects from exposure (through pica or otherwise) to iron in soil.

3
4 Lead was detected in residential soil at a maximum level of 625 ppm. In children with pica
5 behavior, this could produce an elevated BLL above 10 µg/dL, which is the current standard by
6 which ATSDR determines if someone has an elevated blood level that could lead to adverse
7 health effects. This is assuming 100 percent bioavailability and other parameters.

8
9 Dr. Cember asked how much soil a child would have to ingest; 5,000 milligrams (or 5 grams) for
10 52 times a year over 3 years, answered Dr. Markiewicz.

11
12 Mr. Washington expressed his belief that the lead in that backyard sample had probably come
13 from paint. Dr. Markiewicz explained that they did not know if there was a paint chip there—
14 they did not know the source of the lead. He said that someone could have used leaded gasoline
15 and spilled the gas while cleaning engine parts. Mr. Hanley indicated that this was not
16 widespread. Dr. Markiewicz stated that this was correct: based on all of the lead data, there was a
17 high hit of lead in only one residential area.

18
19 Dr. Markiewicz explained that one recommendation made in the PHA is in support of BLL
20 screening for any child aged 6 months to 6 years. He indicated that some physicians will not do
21 this—you have to persuade them. Lead is a unique chemical. ATSDR looks at it using a
22 multiple-source scenario to consider contributions from water, air, and food; adding
23 contributions from soil lead or paint chips can really elevate a child's BLL. Thus, he said, this
24 was speculative, but acute health effects could be caused if pica behavior occurred at the
25 maximum detection.

26
27 Ms. Adkins said that children might only eat dirt three times a year, but a lot of people around
28 here eat a lot of garden-grown root vegetables daily. She stated that this was a consideration for
29 her, but expressed her belief that they were going to say that this is a consideration for the past
30 and not the present. According to Ms. Adkins, a former practice of farmers and people who grew
31 flowers and vegetables was to take dumped sludge from the ORR and carry it to fertilize their
32 flowerbeds and gardens. She expressed concern that there are probably people all over this
33 community who have nice flowerbeds and gardens, but do not understand why. She expressed
34 her belief that this would mess up the average because there are places (she did not know where)
35 that will be really high across the whole periodic table. She said this really concerns her because
36 people are growing vegetables in these spots right now, and so it is really hard to say that things
37 are as good as they wish they were.

38
39 According to Ms. Adkins, the county and state extension office was one of the most trusted
40 government agencies. She indicated that they conduct soil testing and asked whether they would
41 do this type of testing to cover these problems. She asked if there was any way, since they are an
42 existing agency that already tests soil, to connect with them and encourage them to add some
43 things to what they test for so people can see if some of these things from the past are in their
44 gardens. She added that she used to work for the extension office, but did not know the extent of
45 the chemicals they tests for. Dr. Markiewicz replied that they typically do not look at heavy

1 metals but test for more basic soil science things, such as nitrogen, potassium, organic matter,
2 and phosphorous. It costs more money any time more analytes are added.

3
4 Dr. Markiewicz explained that recommendations are made in the vegetable section about ways
5 people can reduce their exposure if they are concerned. For instance, people can create raised-
6 bed gardens for which they bring in clean soil or add amendments to existing soil, such as using
7 a lot of organic matter that is clean—not sewage sludge because this also has heavy metals.
8 Based on studies, lead on root vegetables is typically on the outside. Some people do not wash
9 their vegetables as well as they could and do not use brushes to scrub them. According to the
10 studies Dr. Markiewicz has seen, a good cleaning process can eliminate the vast majority of lead,
11 since it mostly attaches to the outside of the root. Thus, there are ways to reduce exposures.

12
13 Ms. Adkins expressed her belief that wording has to be very important here. In her opinion, she
14 said, people will not be conscious about this if they do not think there is really a problem. She
15 expressed concern that this was a very real thing because people might have raised-bed gardens
16 that have dirt that is rich because it contains sludge brought over from the ORR. Dr. Markiewicz
17 agreed with Ms. Adkins, noting that there are certain vegetables that take up particular metals
18 better than others. In the document, there is a caveat saying to bring in clean soil. However, he
19 said, you could get soil from someone’s backyard or from somewhere you think has good soil,
20 but not know what is in it. Even if you buy soil at Home Depot, he stated, it does not mean that
21 you know what is in the soil either. He added that companies often amend soil with certain
22 things, and thus there could be some heavy metals in it. He explained that there are standards for
23 certain states; he was not sure of the standards in Tennessee. He noted that people use all sorts of
24 things in their gardens, such as sewage sludge and Dillo Dirt, that contain metals.

25
26 Ms. Adkins asked if there was any way to request or beg for instance the University of
27 Tennessee soil test laboratory to expand the list of contaminants it will test for. She suggested
28 that they let the public know that there are dangerous things out there and recommend having
29 tests conducted for these things because of bad practices in the past. Dr. Markiewicz said he did
30 not know how widespread that was, but only three were found based on the data ATSDR
31 reviewed. However, he stated, they did not go into everyone’s yard and sample in everyone’s
32 garden. He explained that he had worked for the state before he worked for the federal
33 government, and state budgets are tighter. According to Dr. Markiewicz, you will not see the
34 state routinely adding analytes such as cadmium, arsenic, and lead. However, he said, the state
35 could always be asked. In his opinion, the state would probably tell someone who is concerned to
36 take the soil sample to and pay a laboratory to run the analysis. He said that such testing is fairly
37 inexpensive, but a lot of people do not do it. One action you can take is to add organic matter,
38 such as a compost pile, that tightly binds metals and other chemicals in soil. Because organic
39 matter has one of the highest binding capacities for those metals, they will not get into the plants,
40 vegetables, or fruits.

41
42 Mr. Hanley asked Ms. Adkins which facility she was referring to. She replied that she had the
43 information at home, but she could get the information regarding where farmers and workers
44 came and got truckloads of this stuff, and also shared it with their neighbors. Dr. Markiewicz
45 asked if she was referring to sewage sludge. She said she was, expressing her belief that it was
46 nasty and highly dangerous. Dr. Markiewicz stated that this was interesting, indicating his

1 knowledge that a lot of this happened in the past. He referred to a site in Pennsylvania where a
2 battery recycler gave casings away as till material and now there are 300,000 ppm of lead in
3 people's backyards. Dr. Markiewicz noted that this can happen, stating that back then people
4 thought this was good because it was fill.

5
6 Mr. Box asked if this was sludge from the plants or from the Oak Ridge sewage treatment plants.
7 According to Ms. Adkins, it was radioactive sludge from the ORR processes, which was cleaned
8 out of the equipment at the plants; it was then carried by pickup trucks to communities all over
9 this area. Mr. Box expressed his knowledge that many people took sludge from the city. Ms.
10 Adkins said it came not from the city but from the ORR processes.

11
12 Dr. Markiewicz indicated that the health evaluation portion of the public health implications
13 section provides a summary table (Table 5) of chemicals of concern. The table lists the chemicals
14 and goes into detail. The section discusses non-pica-behavior children (those playing outside)
15 and adults. Whereas pica assumes acute types of exposure, this evaluation considers more
16 chronic or subchronic exposures—exposures occurring more than once a week or once every
17 couple of days. The last column of the table says whether there are public health implications; if
18 there are, these chemicals are carried through because they need more discussion.

19
20 Cadmium in vegetables was carried through, though ATSDR had limited vegetable data. From a
21 public health perspective, Dr. Markiewicz said, they do not feel this is a problem: only 40
22 percent of the samples had detectable levels of cadmium. If a person consumed vegetables on a
23 routine basis (1.2 pounds per year) at the reported levels, that person might suffer kidney effects
24 after years of exposure. Dr. Markiewicz said that he does not have a large garden, but has already
25 consumed more than this amount out of his own garden. If someone ate more, then cadmium at
26 these levels over many years of exposure over a lifetime could result in kidney effects. He
27 indicated that this brought up their conversation about what soil is out there, what the vegetables
28 are grown in, and what people are eating. He noted that there was not a robust data set, but this
29 was the one pulled through that needed this discussion and conclusion.

30
31 Dioxins in an unidentified fish species were also carried through. Dr. Markiewicz said when they
32 looked at the data, it was easy to say if people ate bass, catfish, and sunfish. However, he stated,
33 if they did not know what the species was, then they kept it in instead of throwing it out because
34 it might be something a person would eat. Dioxins were identified as indeterminate because they
35 did not have enough data; however, if people follow the fish advisories currently in place, which
36 will limit and mitigate exposures, health effects are not expected.

37
38 Dr. Markiewicz explained that mercury and PCBs were the two chemicals really driving fish-
39 type exposures for this pathway. He added that these were fish from a pond near K-25 that has
40 limited access. He said he did not expect that people were going to be eating fish at subsistence-
41 type levels out of this pond because they probably fish in other areas. For all other chemicals, Dr.
42 Markiewicz stated, no public health effects are expected. He noted that the document provides
43 detailed descriptions of how these conclusions were developed.

44
45 For the conclusions and recommendations, current and future exposure to dioxins pose an
46 indeterminate public health hazard; however, following current fish advisories will mitigate and

1 reduce that exposure. In addition, current and future exposure to remaining site-related chemicals
2 pose no apparent public health hazard. Nonetheless, Dr. Markiewicz said, people should refer to
3 the text for cadmium in vegetables and arsenic and lead for children exhibiting pica behavior.

4
5 Dr. Davidson pointed out that the comment period is from September 18 to November 18, and
6 Dr. Malinauskas requested the comments on the document by October 24. Dr. Markiewicz asked
7 for any comments to be e-mailed to him or Mr. Hanley, and they would respond back. He
8 indicated that the document contained a lot of information, and asked the ORRHES members to
9 point out anything that does not make sense or needs further clarification because now is when
10 changes can be made.

Update: Collecting Information About Communities Surrounding the ORR

11
12
13
14
15
16 Ms. Horton provided a brief update on collecting information about communities surrounding
17 the ORR. (She explained she had been unable to present an update at the June meeting.) She
18 referred to the table that had been handed out, which discussed reviewing articles, the literature
19 review, and entering concerns into the Community Concern Database.

20
21 Ms. Horton referred to the first task on the table, noting that it had already been completed.
22 Under this task, 190 newspaper articles were reviewed and identified concerns were put directly
23 into the database. There were 138 community concerns entered; these came from 65 of the 190
24 articles. The other 125 articles either discussed sites not related to the ORR, raised only worker
25 concerns, or identified no concerns. Concerns from surveys and reports were also entered.

26
27 Referring to the second task, Ms. Horton said that she and Maria Teran-MacIver had attended
28 several meetings, some with Ms. Vowell. These included a Tennessee Public Health Association
29 meeting, a meeting of the Cancer Coalition (Nashville), and a meeting with Ms. Vowell and
30 some of her counterparts at TDOH. Ms. Horton expressed her belief that they had been able to
31 make some great contacts and obtain some resourceful information leading up the ACI.

32
33 The third task entailed interviewing key representatives. The list of people contacted included:

- 34
35 • Breast and Cervical Cancer Program for Tennessee
- 36
37 • UT, Department of Health and Safety Sciences
- 38
39 • Baptist Regional Cancer Center
- 40
41 • UT Extension and Community Based Health Initiatives
- 42
43 • Vanderbilt-Ingram Cancer Center
- 44
45 • Tennessee Department of Health
- 46

- 1 • National Cancer Institute, Cancer Information Center
- 2
- 3 • Knoxville Better Health Initiative
- 4

5 Ms. Horton explained that they have already made these contacts, gathered brochures, and
6 collected literature. If the budget allows and if it is appropriate when the report is released, they
7 might have some meetings in the future where these agencies and individuals can come with
8 their information.

9

10 The fourth task, which was not on the table, was related to education training. In April, ATSDR
11 had Dr. Robert Brent make two presentations, one in Oak Ridge and the other in Kingston. Notes
12 were taken during the meetings, and community concerns collected from those sessions were
13 entered in the Community Concerns Database. In addition, DVDs were made of those sessions.
14 Mr. Hanley clarified that two DVDs have been made, but they are having difficulty with one of
15 them because of lighting. They are still working on this issue.

16

17 Dr. Cember confirmed that they had not seen these DVDs yet. Mr. Hanley said this was correct,
18 noting that they needed to get multiple copies made.

19

20 Mr. Lewis asked if they would ever be able to see and read the concerns. Ms. Horton expressed
21 her belief that they could be printed out. Mr. Hanley said he believed this could be done. Ms.
22 Horton noted that it could be a future agenda item. In his opinion, Mr. Lewis said, at a minimum
23 they should be able to read these, look at them, and get a feel for what was said. In addition, he
24 expressed his belief that whoever is working here needed to have the issues and concerns that
25 have been raised before. He suggested that the list be printed out so someone has an idea of what
26 has been said so they never have to do this again. Mr. Hanley explained that the appropriate
27 concerns will be taken, placed into the appropriate PHAs, and addressed. Mr. Lewis expressed
28 concern that they did not even know if all of the PHAs would be finished. Thus, he said,
29 someone should have a repository of the issues raised. Dr. Charp asked if Mr. Lewis was
30 referring to a data dump of the file similar to what Melissa Fish had. Mr. Lewis indicated that he
31 wanted to have this somewhere so that if ATSDR does not complete these reports, they will be
32 able to go back and know the issues that are out there and not have to deal with this again.

33

34 Mr. Hanley explained that if ATSDR can get funding, then most of the PHAs could be finished.
35 He added that the portion of the document containing just the concerns and responses is pulled
36 out separately on the Web site. Mr. Lewis said that this was what he had liked about the TSCA
37 Incinerator PHA.

38

39 Dr. Davidson asked if the Community Concerns Database would be available on the Web site so
40 the public could search it. Mr. Hanley said it would not be.

**Overview of the National Academy of Sciences Biological Effects of Ionizing
Radiation VII Committee's Report**

Dr. Charp explained that in 1998, several agencies (EPA, DOE, the U.S. Department of Defense, HHS, and the National Institute of Standards and Technology) asked the National Academy of Sciences (NAS) to look at radiation risk that had been developed earlier and present the findings as the Biological Effects of Ionizing Radiation (BEIR) V report. Jon Richards indicated that the Nuclear Regulatory Commission (NRC) was also one of the agencies. Dr. Charp said that was correct. He explained that NAS had been asked to review all of the new radiation low-dose studies that have been released since the BEIR V report and come up with a modification or some new information, which was what they would discuss today.

Dr. Charp explained that the BEIR VII's Phase 2 was released over this past summary; Phase 1 was conducted to determine whether it was feasible to do this report. He indicated that nearly every sheet had the header "Prepublication Copy Uncorrected Proofs" when it was released this summer. He explained that this means the information is subject to change, and therefore what he was going to tell them is subject to change. Dr. Cember pointed out that the report should not be quoted or cited. Dr. Charp said he was not quoting and not necessarily citing either; he said a lot of what he would say came from the report.

According to Dr. Charp, when the report was released, the newspapers picked up the executive summary (which is available and may be quoted and cited) and blew it out of proportion by saying that the radiation risk is a lot lower than previously thought and there are a lot more diseases associated with it. After the newspapers came out, ATSDR received phone calls, e-mails, and letters asking if the news was going to change how ATSDR does business and its health calls regarding hazardous waste sites.

Dr. Charp explained that Dr. Cibulas had asked him to review BEIR VII and present it at this meeting. The primary task, as quoted by the report, was "to develop the best possible risk estimate for exposure to low-dose, low-LET (linear energy transfer) radiation in human subjects." The next question was to decipher "low-dose" and "low-LET" and evaluate how they could determine what human subjects would be relevant to these studies.

Dr. Charp indicated that the report focused on low-dose radiation, which it defined as any radiation below 1/10 Gray (Gy) (1 rad or 1,000 millirad). For low-dose LET, he said, this would be below 1,000 millirem (mrem), plus or minus a few percentages. Dr. Cember noted a correction that 1/10 Gy is 10 rad. Dr. Charp stated this was his mistake, noting that they were talking about 10 rad, 10,000 millirad, and 10,000 mrem.

Dr. Charp explained that low-LET radiation does not impart a lot of secondary radiation. He noted that this ionization inside a cell is by definition called sparsely ionizing radiation. He said it is strongly associated with beta particles, x-ray, or gamma rays, so NAS did not look at any reports that talked about neutron radiation or alpha particle radiation. According to Dr. Charp, the other question is how NAS determined what data were relevant; they will go through some of

1 the studies to see what NAS determined to be relevant. Essentially, Dr. Charp said, NAS decided
2 a study was not relevant if it did not meet the standards for number of subjects, power of the
3 study, and so on.

4
5 Dr. Charp stated that the study was supposed to come out in 2001, but came out in 2005.
6 According to Dr. Charp, the study was delayed for a couple of reasons. First, some new low-dose
7 studies were coming out, such as the cohort study reported at the end of last year by Cartis and
8 others that looked at nuclear workers in 15 countries. NAS primarily wanted to see this main
9 study, but also some of the other low-dose studies. Second, NAS was also looking at radiation
10 that the group determined to be chronic, meaning it developed over a short period of time (a
11 couple of months) to a lifetime of exposure.

12
13 Dr. Charp presented and explained a graph showing the schematic curves of incidence versus
14 absorbed dose. Curve A was the linear quadratic curve, which had four points. Dr. Charp said
15 this curve was first defined in about 1946. He indicated that you end up with this odd curve
16 because you have a regular term and then a term that is squared. He added that no one has been
17 able to prove this curve exists, but it is fairly close to what many people think the data actually
18 look like.

19
20 Dr. Charp noted that Curve B is a linear, no-threshold slope. It is also fitted to those four data
21 points, but the curve is forced to go through no points when the x and y coordinates cross. In his
22 opinion, Dr. Charp said, you could probably eyeball it and say maybe that line is not exactly
23 right. The problem then, he said, is to figure out how to define the function that compares the
24 linear quadratic Curve A with Curve B. Something called the Dose and Dose Rate Effectiveness
25 Factor (Curves C and D) was developed based on atomic bomb survivors. According to Dr.
26 Charp, the problem is then to figure out where you start to look at low-dose effects on the curve
27 of absorbed dose and induced incidence. Dr. Charp explained that the curves are fairly close
28 together as you get up to the high end of the curves. However, he said at the lower end, no one
29 knows the right answer regarding whether radiation is protective of health or if it is worse for
30 health. According to Dr. Charp, there is a statement about this in the report. He indicated that one
31 of the issues is that no one has been able to prove the true curve or linear quadratic, and no one
32 has been able to prove or disprove the linear no-threshold curve either.

33
34 Dr. Charp discussed post-BEIR V studies. He said that the BEIR V defined the results down to
35 about 0.2 Gy (20 rad or 20,000 mrem). BEIR VII, however, planned to improve this and get to
36 about 0.1 Gy or less using a five-step process. Dr. Charp said he would not go through this in
37 detail, but he would provide information on the five steps.

38
39 The first step was to determine if the risk is absolute or relative. The second step was to
40 determine if there was a causal relationship between exposure and dose. If no relationship were
41 found, NAS would throw out the study. If there was a relationship, NAS would try to look at any
42 confounding factors (such as smoking and radon exposure). NAS determined a study to be good
43 if all of the causal relationships withstood these tests. The third step involved looking at
44 confidence intervals regarding the uncertainty of the study. NAS evaluated how strong the data
45 were, for example by seeing whether the number of people in a study was large enough for a
46 small confidence interval. Once they had a confidence interval and felt comfortable that the

1 study was good, NAS tried to look at multiple studies (step four). NAS looked at multiple
2 relationships to see how closely all of these studies matched up. For example, if one study finds a
3 relationship with leukemia and another one does not, how do you know which study is right?
4 Thus, NAS tried to find studies that provided similar results. The fifth step involved assessing
5 the relationship between all of the studies and trying to determine what the risk numbers would
6 be.

7
8 Dr. Charp said he would go over the five major studies that NAS reviewed. The 2002 atomic
9 bomb survivor cohort study, called DSO2, is the most recent dose assessment that came out of
10 the atomic bomb survivors. It modified and improved the doses a little bit. According to Dr.
11 Charp, this cohort continues to be a major source of information on human effects from exposure
12 to radiation. This group has been followed for more than 50 years now, since about 1946 or
13 1957. It is a large cohort, probably consisting of close to 100,000 or more people today. The
14 cohort includes all sexes and ages, and people exposed at various ages (in utero, at young age,
15 infants, elderly, and others). NAS is pretty confident, Dr. Charp said, that it has good mortality
16 and cancer incidence data because medical professionals have studied these people in depth.

17
18 Dr. Charp explained an atomic bomb summary graph. For leukemia, he said, the data support
19 curvilinear—not a linear no-threshold—as shown by the little curve between 0.1 and 0.2 sieverts.
20 He expressed his belief that this was a linear curve for all other solid tumors. He pointed out the
21 dotted line beneath the solid line, noting that it curves up. Nonetheless, he said, it is linear.
22 According to Dr. Charp, in the low-dose range, NAS showed that there is very little difference
23 between curves that are linear at that low dose range based on how you draw the line.

24
25 Dr. Charp stated that NAS reviewed specific sites in medical studies, including the lung, breast,
26 thyroid, and stomach, as well as leukemia. He noted that these were studies in which people
27 received radiation during various medical practices, such as therapy, diagnostic tests, iodine,
28 stress tests, and bone tests. NAS concluded that it did not have enough sample size and the
29 quality of dosimetry was not very good. According to Dr. Charp, if your doctor gave you some
30 radioactive material and you asked what dose you would receive, the doctor would say
31 something that is not a radiation dose, such as 5 milliliters. He expressed his belief that doctors
32 will rarely know the radiation dose that is being given. Thus, unless there are really good
33 records, the radiation dose received will not necessarily be known. Even though a physician
34 could give a standard concentration of radioactive material, the dose absorbed differs between
35 individuals because body types differ.

36
37 Mr. Washington asked about the tissue types. Dr. Charp indicated that this was another issue.
38 According to Dr. Charp, most of these medical studies were in the medium- and high-dose range;
39 very few were in the low-dose range. Thus, by definition, NAS sort of discarded the medical
40 studies. Dr. Charp mentioned a co-worker who was part of a nuclear medicine study and
41 received as much as 100 mrem a month, which is well above the low-dose range. Therefore,
42 these studies were not included in the medical reviews.

43
44 NAS also looked at occupational radiation studies. These include studies that were carried out at
45 Y-12; studies conducted in 15 countries across the globe that use nuclear materials; studies of
46 atomic weapons employers in various countries, including England, Russia, France, and

1 Germany; and other studies as well. According to Dr. Charp, there is very good dosimetry
2 relative to some of the other studies because everyone wore film badges. There are over 1
3 million individuals in these studies, including radiologists, radiological technicians, nuclear
4 medicine workers, specialists (dentists and hygienists), defense workers, researchers, and a
5 number of other exposed groups.

6
7 Dr. Charp presented Table 8-7, which compared nuclear workers with atomic bomb survivors. If
8 you looked at all cancers except leukemia, Dr. Charp said, you would see that atomic bomb
9 survivors have an excess relative risk of 0.24, or about 24 percent above the regular risk. For
10 leukemia (except chronic lymphocytic leukemia), atomic bomb survivors have a 2.2 excess
11 relative risk. According to Dr. Charp, the three-country study, which came out prior to the 15-
12 country study, found a similar relationship for leukemia, but did not find a relationship with all
13 cancers. Dr. Charp explained that the excess relative risk is a lot lower in workers than in atomic
14 bomb survivors when you look at the overall studies. Dr. Charp indicated that the main
15 differences between the two are associated with the “healthy worker syndrome” or the dose rate
16 (instantaneous versus over long periods of time; it is unknown).

17
18 In his opinion, Dr. Charp said, the healthy worker effect cannot be excluded from many of these
19 studies. He explained the effect: a worker in a facility may have regularly scheduled medical
20 exams, might get paid extra for doing some of this work, could be badged, might have better
21 health insurance, could know the doses, and could be affected by other similar factors. Therefore,
22 these people will actually have more visits to the doctor and more diagnoses than someone who
23 only goes to the doctor on a fairly irregular basis.

24
25 Dr. Charp asked if Dr. Cember had anything to add, since he discusses this in his textbooks. Dr.
26 Cember said he had read a paper about 20 years ago in the *American Journal of Public Health*
27 that looked at what factors went into good and poor health. Age, sex, education, manner of
28 living, and type of work were all considered. After these things were taken into account,
29 education was the single factor that counted the most. According to Dr. Cember, measures
30 included longevity, age-specific death rate, days absent from work, days spent in the hospital,
31 and other things. When they looked at the groups, all measures showed the same finding—those
32 with graduate school degrees had better health. The next groups (in order from better to poorer
33 health) were people who graduated from college, high school, and elementary school. According
34 to Dr. Cember, people who did not finish elementary school had the worst health. He indicated
35 that education was the primary factor in how healthy these people were, after socio-economic
36 levels and other factors were taken into account. His personal impression, he said, is that nuclear
37 workers are better educated than the average person. He stated he suspected the -0.39 to 0.30 and
38 -0.28 to 0.52 on Table 8-7 were nuclear workers. In his opinion, he said, now nuclear workers
39 show no effect because they are better educated than the average person. He said this was a
40 possible explanation, as was that a little bit of radiation is good for you and helps you live longer.
41 (He said he did not follow the latter, but it is a possibility.)

42
43 Mr. Washington said this still did not give any definitive information regarding what happens
44 when people are exposed to low doses. Dr. Charp said this will be discussed at the end.

1 Dr. Davidson said she took issue with associating things, such as education, with health. In her
2 opinion, she said, it is not education. It could be lifestyle—that people who are more highly
3 educated do not engage in as many risky behaviors (such as smoking) and might have a healthier
4 diet. She expressed her belief that those things can be related, but it was not education per se that
5 would keep you from getting sick. In looking at the rates of cancer and healthy workers, she said
6 she failed to see how this is involved in the mechanism by which radiation would induce cancer.
7 She expressed her opinion that this would be the same regardless of your education level. Mr.
8 Washington said that this was his point as well.

9
10 Dr. Cember asked if these were incidence or death rates. Dr. Charp said he did not recall, but that
11 they were excess relative risks. Dr. Cember explained that the conclusion of this article was that
12 people who are better educated know what to look for so they go to the doctor earlier and can
13 understand medical instructions, and so on. The conclusion was not that a person is inherently
14 more resistant to illness if he or she is better educated, but that a better-educated person will
15 know how to deal better with health problems than a person who is not educated. Mr. Box said
16 they would also more financially able. Mr. Washington indicated that some people might have
17 avoidance. Dr. Davidson expressed her belief that it was not education, but medical intervention.
18 Mr. Washington stated that he had had a heart transplant primarily as a result of education: he
19 knew it was available and he had the insurance to get it.

20
21 Dr. Charp said he had read some of the Army's history of the Manhattan Project, which indicated
22 that one requirement of early custodial staff hired at the ORR was to be illiterate so they would
23 not know what they were throwing away. According to Mr. Washington, this was not true. He
24 said that there were people doing janitorial work who were college graduates. Dr. Charp said he
25 stood corrected.

26
27 Ms. Adkins said if they needed statistics on cancer and workers and so forth, she had interviewed
28 the foreman of 1,400 engineering construction workers at ORR. According to Ms. Adkins, they
29 were young and healthy men from around the area. She stated that the foreman told her that 800
30 of the 1,400 had died of cancer between the ages of 45 and 65; he stopped his count after 800. In
31 her opinion, there is information out there that they could be looking into beside the information
32 that the AEC and DOE have provided. She expressed her belief that they did not have to look at
33 other countries to see how their nuclear workers are doing because there are things they could
34 find if they really looked.

35
36 Dr. Charp said that some of those things have already been looked at. For instance, he said, Steve
37 Wing looked at workers at (he believed) Y-12, and the National Institute for Occupational Safety
38 and Health had looked at ORR workers. There have been other studies done on ORR workers
39 too, so the data are out there.

40
41 According to Mr. Washington, it was only recently that people who worked at ORR died of
42 cancer because local doctors would not put this on their death certificates as a cause of death.

43
44 Referring to occupational studies, Dr. Charp explained that BEIR VII said that the risks were
45 variable, ranging from no risk to a risk an order of magnitude or more higher than those seen in
46 atomic bomb survivors. Because there are no individual doses in most of the cohorts, NAS

1 concluded that the occupational studies have minimal information that is useful for quantification
2 of low-dose health effects.

3
4 In evaluating environmental studies, NAS looked at four groups of people living in areas that
5 have very high natural radioactive background. Two were conducted in China, one in Great
6 Britain, and one in India. Different cancer outcomes were found based on incidence, mortality,
7 and prevalence of cancer in these populations. No higher disease rates were found in the
8 geographic areas within the high background levels of radiation exposure than in the areas with
9 lower background levels. No association was found between radiation and increased adverse
10 health effects.

11
12 Dr. Charp presented a table showing preferred estimates of lifetime risk attributable to exposure
13 for all solid cancers and leukemia for males and females. The first two lines were cancer
14 incidence, the bottom two lines were cancer mortality, and numbers in parentheses were the
15 confidence intervals. For solid cancers in females, Dr. Charp said they had seen around 610
16 deaths from exposure to 10 rad out of an estimated 17,500 deaths without exposure to 10 rad, or
17 about 3 percent.

18
19 Dr. Cember asked if these had been calculated based on the no-threshold. Dr. Charp said this was
20 correct. Mr. Hanley stated that there were 610 excess deaths. Dr. Charp explained that for
21 leukemia in males, there were 70 excess deaths out of 710 deaths, or 10 percent. Jeff Hill asked
22 the level of exposure; Dr. Charp said it was exposure to 10 rad. Mr. Hill asked if this was annual
23 or one time exposure to 10 rad. Dr. Charp replied that it was over lifetime. Mr. Hill confirmed
24 that this was 10 rad over lifetime. Dr. Charp said that was correct.

25
26 Dr. Charp referred to a table detailing the BEIR V continuous lifetime exposure to 1 millisievert
27 per year for cancer mortality. For the top two lines, the risk is per 100,000 in males and females
28 for leukemia and non-leukemia cancer. The rate for non-leukemia is about 2.3 percent in males
29 and about 3.2 percent for females. For leukemia, it is about 9 percent for both males and females.
30 Dr. Charp pointed out that there was not much difference between males and females except with
31 non-leukemia, which he said could be due to the prevalence of breast cancer in women compared
32 to prostate cancer in men. He noted that the report did not clearly state what the difference was.
33 Mr. Hanley asked if this was based on the 1990 data; Dr. Charp said that was correct.

34
35 Dr. Charp presented a table that showed rate comparisons of BEIR V and BEIR VII. According
36 to Dr. Charp, there was about a 21 percent lower rate in males for all cancers, meaning that the
37 BEIR V rate was about 21 percent higher than the BEIR VII rate. In his opinion, Dr. Charp said,
38 BEIR V was way off for all cancers for females, as BEIR VII was 154 percent lower.

39
40 Dr. Charp expressed his belief that one of the problems with the BEIR VII was that there were a
41 lot of uncertainties. One uncertainty has to do with the sampling variability in risk model
42 parameter estimates from the atomic bomb studies. For some of the studies, depending on where
43 the dosimetry was taken, the report extrapolated it out to a low dose, but it may have actually
44 been looking at doses in excess of 100 rad or so. There is also uncertainty about comparing risk
45 from an average Japanese population of the 1940s to the metabolism of a U.S. population. In
46 addition, there is uncertainty in looking at the variability of dose and dose-rate effective factor

1 (DDREF). According to Dr. Charp, this could range from about 1.1 to 2.3 based on the first
2 graph with the A, B, C, and D curves, but the committee used 1.5. Thus, he said, there is 50
3 percent or more variability in doses just based on DDREF.

4
5 Dr. Charp said there are also qualitative uncertainties. The largest qualitative uncertainty is for
6 cancers of the stomach and liver; its main contributor is transport, meaning how transport codes
7 from one population to another. For example, diets of the 1940s Japanese population were very
8 different from those of the “standard” U.S. population. Also, cancers of the bladder and ovary
9 have large uncertainties, with the main contribution being from sample estimation (sampling
10 variability). Female breast cancer and the combined category of solid cancer (excluding thyroid
11 and non-melanoma skin cancer) have the least uncertainty. In both cases, he said, the main
12 contribution is from the DDREF.

13
14 According to Dr. Charp, ATSDR finds the impacts of BEIR VII on the agency to be minimal.
15 ATSDR public health decisions will still be based on dose and dose factors used, which already
16 incorporate linear no-threshold: it is part of the Comprehensive Environmental Response,
17 Compensation, and Liability Act legislation to look at observable and tolerable health effects.
18 The risk numbers from BEIR VII are not significantly different from those in BEIR V. Though
19 there are some variations, when the populations and uncertainties are considered and given the
20 sufficient play, the numbers are essentially the same. The agency will, however, add an appendix
21 to all PHAs. This will provide the old risk numbers of BEIR V, the BEIR VII risk numbers, and
22 possibly EPA risk numbers, and also supply the method that can be used to convert dose to risk.
23 It will provide the doses calculated, show equations to use to take the dose to risk, and provide
24 examples of how to do this. Thus, ATSDR anticipates that providing this appendix will address
25 concerns of ORRHES and the community by showing how to do a risk assessment.

26
27 Dr. Charp referred to another handout from *Health Physics News*, which contained an interview
28 with three people who were involved with the BEIR VII study. In total, about 17 people were
29 involved, including oncologists, physicists, epidemiologists, statisticians, biologists, and others.
30 Dr. Charp said that handout contained two tables from the report and an example of how you
31 could go from risk numbers and calculate the number of excess cancers that might occur. He
32 explained that the new appendix of the PHA will have tables such as this with organ and risk per
33 exposure, and say how to multiply this out.

34
35 Mr. Washington expressed concern that they still had not been told what happens with low levels
36 of radiation at the other end of that curve. According to Dr. Charp, the BEIR VII report said
37 there are insufficient data to say linear no-threshold is wrong or right, and there are insufficient
38 data to say low doses of radiation are protective of human health. There were, however,
39 significant data to say that low-dose radiation is not more harmful than the linear no-threshold
40 will predict. Mr. Washington asked what this has really told them because it is not any different.
41 Dr. Charp said the report said the same thing in 1990 as the BEIR VII—they did not know.

42
43 According to Dr. Cember, not being able to prove this one way or another was inherent in this
44 situation because the additional number of cancers predicted at these low doses are within the
45 statistical year-to-year variability in the number of cancer cases. Therefore, he said, you cannot

1 distinguish additional cancers from naturally occurring cancers (those that would occur without
2 the radiation dose), and it can never be proven or disproved which category a cancer belongs to.

3
4 Dr. Charp explained that in a population of 100,000 people, one-third of the population will get
5 cancer normally. Thus, if you say the risk of cancer from radiation exposure is about 5 percent,
6 this will be out of the approximate 30,000 people who will get cancer. Dr. Charp expressed his
7 belief that the rates of cancer are not steady—they bounce around—so these excess cancers
8 would be in the “noise.” According to Dr. Charp, cancer from radiation is right now
9 indistinguishable from cancer caused by chemicals or natural effects. However, he said, the
10 National Council on Radiation Protection and Measurements held a meeting 3 years ago that
11 discussed gene markers for sensitivity to ionizing radiation. He said that they are beginning to
12 find some of these, but there are not enough data yet to show they are true findings. However, he
13 stated, the theory is that certain genes are more susceptible to radiation than others. For instance,
14 he said, for one particular area of exposure there could be about 200 or 700 genes that might be
15 involved in some type of radiation repair.

16
17 Mr. Washington asked Dr. Charp for his opinion about people in Japan who are still alive and
18 had high doses of radiation. Dr. Charp replied that about half of the people who had high doses
19 are still alive. He asked them to think about the people from the Manhattan Project who have
20 multiple curies of plutonium still in their bodies and are still alive. Mr. Richards said it was a
21 matter of probability—if you smoke, there is not a 100 percent chance you will get cancer.

22
23 Dr. Cember stated that 25 out of the 26 Lost Alamos workers who inhaled enormous amounts of
24 plutonium, more than the maximum acceptable body burden, are still alive. The other one died
25 about 2 years ago from bone cancer, he said.

26
27 Mr. Box asked if the study covered both external and internal radiation. Dr. Charp said that it
28 did. Mr. Box asked why the study did not consider alpha. Dr. Charp explained that the study
29 looked at low-dose, low-LET, and alpha is a high-energy linear transfer. Thus, on a relative
30 basis, alpha is about 10 times higher: about 1 rad alpha is equivalent to about 1/10 rad beta.

31
32 Mr. Merkle asked Dr. Charp about some wording questions. He referred to the occupational
33 summary and read “Risk estimates from these studies are variable, ranging from no risk to risks
34 an order of magnitude or more than those seen in atomic bomb survivors.” Mr. Merkle
35 questioned whether this should say “or more *less* than,” stating that the table makes the medians
36 look less. Dr. Charp said it would be less, but for all cancers. Mr. Merkle said he knew this. Dr.
37 Charp said you could throw those out. Mr. Merkle indicated, however, that the confidence
38 intervals do not vary over a factor of 10, but medians do. Dr. Charp agreed that this should be
39 “less than.”

40
41 Mr. Merkle asked about the word “preferred” in the table “Preferred Estimates of Lifetime Risk
42 Attributable to Exposure.” Dr. Cember indicated this depended on which model you use to make
43 the estimate. Mr. Merkle asked if they were talking about a best estimate; Dr. Charp said this was
44 correct.

1 According to Dr. Cember, in the BEIR V, there was a statistically significant difference between
2 irradiated and non-irradiated for the total number of cancers and for breast cancer in female and
3 leukemia, but there was no statistical significance from the frequency in the general population
4 for other individual cancers (such as colon cancer). Thus, he said, there was only an increased
5 number when they were concentrated together. He asked how this compared to the BEIR VII.
6 Dr. Charp expressed his belief that it may have involved some of the same tactics. For instance,
7 in the BEIR V, NAS decided to throw out things like gastrointestinal cancers. Dr. Cember said
8 this was correct, noting that they were not statistically significant, though the trend was toward
9 more cancers in irradiated than non-irradiated (though it was not statistically significantly more).
10 According to his review, Dr. Charp said, the same method of handling was done in BEIR VII.
11 Dr. Cember expressed his belief that the total number of excess cancers, for all kinds of cancers
12 together, was about 500 more among Japanese survivors. Dr. Charp recalled that this was
13 correct, noting that the cancers were mostly leukemias. Dr. Cember reiterated that they were all
14 together; Dr. Charp indicated that this was not a lot. In his opinion, Dr. Cember said, this is what
15 leads to the great degree of uncertainty.

16
17 According to Dr. Charp, a prevalence of non-cancerous health effects is showing up in the
18 Japanese atomic bomb survivor studies. Most of these are related to the cardiovascular system
19 and are associated with radiation exposure. Dr. Charp asked why, if this is true, they give people
20 nuclear medicine tests for cardiovascular studies.

21
22 Dr. Davidson asked if any of these studies looked at cancer incidence or mortality in younger
23 people. The theory, she pointed out, is that you will die of cancer if you live longer and eliminate
24 all competing causes of death; therefore you are more likely to get cancer as you get older just
25 because of aging. She suggested looking at a younger subset that is not expected to get cancer
26 instead of picking a whole group and including these individuals with those in the much higher
27 age range. Dr. Charp said Dr. Davidson was correct. He indicated that some recommendations
28 were made at the end of the report to include looking at exposures to people younger than the
29 average workers, such as people under 18. For the longest time, Dr. Charp said, lifetime radiation
30 exposure limits were calculated by subtracting 18 from your age and then multiplying by 5. He
31 explained that there was really not much exposure to people under 18 for a very long time so it
32 was assumed they should not have had any exposure.

Additional Business

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37
38 Dr. Davidson reminded the ORRHES members to send their comments to Dr. Malinauskas on
39 the *Evaluation of Current (1990 to 2003) and Future Chemical Exposures in the Vicinity of the*
40 *Oak Ridge Reservation* by October 24. She said that if they had no work group meeting, Dr.
41 Malinauskas would collate the comments and prepare to send them to ATSDR if they had
42 another ORRHES meeting. If there was no work group meeting, they would bring the
43 recommendation to ORRHES directly. Dr. Cember asked what would determine if they had
44 other meetings. Dr. Davidson said it would depend on money. Dr. Cember asked whether the
45 money had been appropriated already for this year. Dr. Davidson explained it was for the fiscal
46 year beginning on October 1.

1 Dr. Davidson noted that September 30 is the last day that the field office will be open.

2
3 Ms. Adkins said she had called Advanced Wellness in Nashville at 1-800-433-0854. According
4 to Ms. Adkins, they were willing to work with ATSDR, and she told them that Mr. Hanley
5 would be calling them. They could not provide individual information, but they could tell the
6 frequency of contaminants found in residents and workers in this community.

7
8 Ms. Adkins said she had made a statement earlier that she did not back then, but wanted to do so
9 at this time. She read some portions of her notes to the group. According to Ms. Adkins, the
10 water intakes were far above the allowed limits at K-25, and the water was tested every 3 or 4
11 days at carefully selected times. She quoted a statement reportedly made by an official to an
12 official of the plant, "We've been ordered not to test our own intake water. It's highly sensitive.
13 It contains extremely high concentrations of cesium 137 and strontium 90. The orders come
14 directly from DOE headquarters."

15
16 According to Ms. Adkins, materials from Y-12 (plutonium, uranium, assay materials, nickel, and
17 every other metal) were dumped into one end of Poplar Creek and the Clinch River and four
18 ponds at the west end of Y-12. She expressed her belief that these were dumping sites for nitric
19 acids and all kinds of hazardous wastes. According to Ms. Adkins, Tennessee officially ordered
20 the plant to be shut down in the 1980s, and the area was later cleaned up in 1985. She claimed
21 that it showed excrement from the guts of people at K-25, and it was loaded with cesium 137,
22 strontium 90, and other hazardous materials. She expressed her belief that samples of intake
23 water showed that these wastes were from X-10 and went into the Watts Bar and the Clinch
24 River, and toxic wastes were dumped into White Oak Creek from X-10.

25
26 According to Ms. Adkins, bacteria surrounded the toxic particles in the Y-12 and X-10 sludge
27 that was placed in the K-25 sewage plant reaction chamber. The sludge contained nickel,
28 cadmium, and arsenic, and radioactive K-25 sewage workers dumped this toxic sludge at the
29 pond onto sand beds to drain the sludge. She expressed her belief that workers loaded the trucks
30 with this radioactive fertilizer for area gardens. She noted that she wanted to be clear where this
31 material came from and what it had contained because some people had asked her.

32
33 Dr. Charp indicated that the S-3 ponds are not a parking lot. Ms. Adkins said it was the S-1, S-2,
34 S-3, and S-4 ponds she had mentioned. Dr. Cember asked if S-3 ponds were paved over; Dr.
35 Charp said they were. Ms. Adkins expressed concern that the gardens are still growing
36 dandelions, sweet potatoes, and radishes. In fact, she said, her potatoes were the largest potatoes
37 at the Tennessee Valley Agricultural Industrial Fair for 7 years straight.

38
39 Dr. Davidson thanked everyone for coming to the meeting, particularly those who had stayed to
40 the end.

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Meeting Adjourned

Dr. Davidson said they will wait to hear from ATSDR regarding ORRHES's continuing role in the public health assessment process. She adjourned the meeting at 6:45 p.m.