

Exhibit 152

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UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NORTH CAROLINA

CAMP LEJEUNE WATER)	
LITIGATION,)	
)	
Plaintiff,)	Civil Action No.
)	7:23-cv-897
vs.)	
)	
UNITED STATES OF AMERICA,)	
)	
Defendant.)	

DEPOSITION of DAVID A. SAVITZ, Ph.D., taken at the U.S. Attorneys Office, 100 Middle Street, Portland, Maine, on June 10, 2024, commencing at 9:06 A.M., before Lisa S. Bishop, RPR, RMR, a Notary Public in and for the State of Maine.

Job No. MDLG6700474

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1 THE VIDEOGRAPHER: We are now on the record. My
2 name is Gil Whitney. I'm the videographer with Golkow
3 Litigation Services. Today's date is June 10, 2024, and
4 the time is 9:06 A.M. This deposition is being held at --
5 held in Portland, Maine, in the matter of Camp Lejeune
6 Water Litigation versus United States of America for the
7 Eastern District of North Carolina, Case No. 7:23-cv-897.
8 The deponent is David A. Savitz, Ph.D. Today's appearances
9 will be noted in the stenographic record. The court
10 reporter is Lisa Bishop. The witness may be sworn.

11 DAVID A. SAVITZ, Ph.D., having been duly sworn by the
12 Notary Public, was examined and testified as follows:

13 EXAMINATION BY ATTY. BAIN:

14 Q Good morning, Dr. Savitz. Could you please state
15 your name for the record?

16 A Sure, David A. Savitz.

17 MR. TELAN: Adam, before you begin the
18 substantive part of your deposition, I just want to put on
19 the record that pursuant to the stipulated Rule 30
20 deposition protocol signed by the judges in this case on
21 October 23rd, 2023, paragraph nine, we are objecting to the
22 attendance by members or counsel for the NRC today who have
23 identified themselves, I believe Mr. Johnson and Mr. Perez.

24 MR. PEER: Peer.

25 MR. TELAN: Peer. So our position in this, Adam,

1 is that while the Court has not yet ruled on the motion
2 that's been filed, their attendance here today is in
3 violation of paragraph nine of the court order as we object
4 to their attendance and so we would also object to any
5 participation by them outside of their attendance as well,
6 so I don't know if there's an intent to ask questions, but
7 that would be objectionable as well.

8 MR. BAIN: Okay. Thanks, Pat. So noted for the
9 record.

10 MR. JOHNSON: Since I'm here and recognized by
11 this objection, this is Jay Johnson. I'm counsel for the
12 National Academy of Sciences. I have no intent to ask
13 questions. We are here because we filed a motion in the
14 United States District Court for the District of Columbia
15 that seeks to protect the Academy's confidential internal
16 deliberations and the Committee's deliberations. That
17 motion has not been decided yet, as I think Pat referenced,
18 so we are here to protect the Academy's interests.

19 Q Okay. Now that that is out of the way, we can get
20 started with the deposition. Dr. Savitz, I know you have
21 been deposed before; is that correct?

22 A Yes, I have.

23 Q So I won't belabor the deposition rules, but I
24 will go through a couple of them I think that might be
25 helpful. You do know that you are under oath, right, so

1 that your answers must be truthful?

2 A Yes, I do.

3 Q And if you don't understand a question that I ask,
4 will you please ask me to clarify the question, otherwise,
5 I will assume that you understood it?

6 A Yes, I will do that.

7 Q And let's try not to talk over each other.
8 Sometimes there's a tendency to do that in these
9 depositions, so if you can wait until I finish my question
10 before you start your answer and I will try to do the same
11 with respect to your answers.

12 A Okay.

13 Q What is your occupation?

14 A I am an epidemiologist, professor at Brown
15 University.

16 Q How long have you been a professor at Brown
17 University?

18 A For 14 years.

19 Q So since approximately 2010?

20 A That's correct, yes.

21 Q Have you held any other teaching positions?

22 A Yes, I have.

23 Q Can you briefly describe the other teaching
24 positions you have held?

25 A Yes, my first academic position at a university

1 was when I got my Ph.D., I was at the University of
2 Colorado School of Medicine from 1981 to 1985, then at the
3 University of North Carolina from 1985 to 2005, and then at
4 Mount Sinai School of Medicine in New York from 2005 to
5 2010.

6 Q Were you a professor in epidemiology in all those
7 positions?

8 A It wasn't the department of epidemiology, but I
9 worked as an epidemiologist in each of those positions.

10 Q Have you held any elected positions in
11 professional societies in the field of epidemiology?

12 A Yes, I have.

13 Q Can you briefly describe what those have been?

14 A Yes, I was president of the Society for
15 Epidemiologic Research and president of the Society for
16 Pediatric and Perinatal Epidemiologic Research. And the
17 other elected office was at the International
18 Epidemiological Association, I was the North American
19 regional counselor.

20 Q Have you been a member of any editorial boards for
21 journals in the field of epidemiology?

22 A Yes, I have.

23 Q Can you briefly describe what those have been?

24 A Yes, I served as an editor at the journal called
25 Epidemiology and at the American Journal of Epidemiology

1 and Environmental Health Perspectives.

2 Q Can you briefly describe what the field of
3 epidemiology is?

4 A The standard textbook definition is the study of
5 the distribution and determinants of disease. It is with
6 the intent of identifying methods for prevention of disease
7 and improving public health.

8 Q Is it also a study of the causes of disease?

9 A There is clear interest in that in order to
10 effectively prevent disease, you have to know something
11 about what causes it so that you are able to modify those
12 causes.

13 Q Are you familiar with the National Academy of
14 Sciences?

15 A I am, yes.

16 Q What is your understanding of the mission of the
17 National Academy of Sciences?

18 A It's to address societal concerns for which
19 scientific information is helpful. There are different
20 branches of it. I'm most familiar with the National
21 Academy of Medicine, which I'm a member of, but the broader
22 mission is to advise the government or other authorities on
23 matters that bear on science and public health.

24 Q Have you served on committees of the National
25 Academy of Sciences?

1 A Yes, I have.

2 Q What is your understanding of how the National
3 Academy of Sciences funds its research?

4 A They receive sponsorship from some organization
5 that asks for their help in addressing particular
6 questions. The specific sponsors vary quite a bit, but the
7 general process is the -- they are brought in to provide
8 scientific information to inform some decision.

9 Q Do you know whether the National Academy of
10 Sciences is an agency of the federal government?

11 A My understanding is that it is not.

12 Q What is your understanding of the relationship
13 between the National Research Council and the National
14 Academy of Sciences?

15 A To be honest, it's always been a little bit murky
16 to me, the territory, but I believe the National Research
17 Council is the entity that oversees the committees and the
18 reports separate from the membership entities like the
19 National Academy of Medicine.

20 Q When did you first serve on the National Academy
21 of Sciences committee?

22 A I am not precisely sure. It would have been
23 probably somewhere in 2003, 2005, somewhere in that range,
24 I believe.

25 Q Can you tell us approximately how many National

1 Academy of Sciences committees you have served on?

2 A It's at least a dozen, maybe more like 15 at this
3 point.

4 Q Can you provide the names of some of the
5 committees you served on?

6 A Again, I would be hesitant to say that I'm getting
7 the exact title right. I could speak to some of the
8 content of the committees, most recently, one on infant
9 feeding practices, one on the health effects related to
10 open burn pits and the registry for veterans who had
11 enrolled in -- based on their exposure to open burn pits,
12 obviously the Camp Lejeune, addressing the concerns there,
13 going back, the anti-malarial drugs and sequelae among
14 military veterans, E-cigarettes. Again, I can probably
15 come up with others, but it covers, as you can tell, a fair
16 range of different topics.

17 Q What roles have you played on those committees?

18 A On a number of them, I've been chair, and on
19 others, a member, but not the chair.

20 Q Okay. Are you familiar with the National Academy
21 of Sciences Code of Conduct?

22 A In general terms, yes.

23 MR. BAIN: I would like to have this marked as
24 the first exhibit.

25 (Exhibit No. 1, National Academy of Sciences Code of

1 Conduct, marked for identification.)

2 Q Dr. Savitz, I'm showing you what has been marked
3 as Exhibit 1, the National Academy of Sciences Code of
4 Conduct. Would you mind reading into the paragraph the
5 first paragraph of that code?

6 A Sure. The National Academy of Sciences, NAS, was
7 created by President Abraham Lincoln during the Civil War
8 as an independent nonprofit self-perpetuating honorary
9 society of the nation's leading scientists to provide
10 unbiased advice to the nation on any matter for which
11 evidence can inform sound public policy. The credibility
12 of the advice from the NAS rests on its reputation which
13 depends on the reputation of its members. Membership in
14 the NAS is a privilege predicated on its members adhering
15 to certain standards of conduct and NAS members are
16 expected to abide by this code of conduct.

17 Q As a member on many of the NAS committees, what is
18 your understanding of the role of NAS to provide unbiased
19 advice as referenced in this code of conduct?

20 A I think that as I interpret it, it is to be as
21 neutral and objective as possible in interpreting the
22 relevant evidence. Again, it depends very much on the
23 specific question, but it certainly of course includes not
24 being biased based on either financial interests or even
25 personal ideology and accepting the charge to develop the

1 information that is needed to respond to the charge.

2 Q Have you written in a recent book on Epidemiology
3 and the Law that an epidemiologist should not be an
4 advocate?

5 A As a scientist, that is my view, in other words,
6 epidemiologists can play multiple roles, but in generating
7 epidemiologic research and interpreting it, if they are
8 speaking as an epidemiologist, not as a concerned citizen,
9 but as a epidemiologist, I believe that is the case.

10 Q In your experience, does the NAS try to guard
11 against having experts with an ideology, for example,
12 rooted in some type of particular political perspective?

13 MR. TELAN: Object to the form of the question.

14 A They -- again, from my experience on committees,
15 they -- there's a clear effort to address financial
16 interests. I think there is also at least an awareness and
17 recognition that strongly held ideology could prevent some
18 individuals from being effective in their role as a neutral
19 arbiter.

20 Q Have you written in your recent book on Law and
21 Epidemiology that in general, those who tend to implicate
22 every agent as harmful to health typically come from the
23 political left and those who never conclude that an agent
24 could cause health harm come from the political right?

25 MR. TELAN: Form objection.

1 A I mean it's impressionistic. I have to say I have
2 not done -- it's not science based, I probably should be
3 careful about that, because I'm inferring something maybe
4 about the broader political ideology which may or may not
5 be true. I think what I do believe is there's a pattern
6 among certain individuals based on their past record of
7 interpretation.

8 Q So you have written that though?

9 A Yes, I have written that.

10 Q And have you written that in scientific and
11 professional circles, an expert is likely to be more
12 credible as a neutral interpreter of scientific evidence?

13 MR. TELAN: Form objection.

14 A I'm sorry, in the context of that, more
15 credible -- I was not sure what contingency, what would
16 make them more credible? I may need to see.

17 Q Yeah, it's in your book on page 138 of
18 Epidemiology and the Law when you are talking about
19 different potential biases that might come into play with
20 respect to epidemiology, that an expert in epidemiology is
21 likely to be more credible as a neutral interpreter of
22 scientific evidence.

23 MR. TELAN: I'm sorry, Adam, can we -- if you are
24 going to reference quotes from -- from a text, would you
25 mind showing Dr. Savitz so he could look at that himself?

1 MR. BAIN: Sure, I will read the full sentence
2 here.

3 MR. TELAN: If you wouldn't mind, if you could
4 just show it to him.

5 Q Okay. I'm showing you, Dr. Savitz, your book,
6 Epidemiology and the Law.

7 A Thank you.

8 Q Referencing page 138 in particular. And I think
9 it's the first paragraph there toward the bottom, do you
10 see the sentence that starts while forceful advocacy?

11 A I'm sorry, the first full paragraph?

12 Q No, the paragraph above that.

13 A Okay. Yes.

14 Q It says while forceful advocacy may seem helpful,
15 in scientific and professional circles, an expert is likely
16 to be more credible as a neutral interpreter of scientific
17 evidence and leave it to the attorney to employ their
18 assessment in an advocacy role.

19 A Yes, I see that.

20 Q What did you mean by that?

21 A I mean that I believe -- it's my philosophy
22 obviously that it's important for the expert to really
23 limit their expertise to where they have the foundation to
24 do so. In other words, we are trained to generate and
25 evaluate research in an informed way. We may be advocates

1 in our regular lives, but -- and I have written elsewhere
2 it's important to separate those roles even in a setting
3 like a legal setting where there are advocates and there is
4 an issue under contention, I believe it's -- we best serve
5 that process by staying within our lane and providing the
6 expertise that we have to offer that is relevant.

7 Q Okay. Thank you. That's helpful.

8 MR. BAIN: Can I have this marked as Exhibit 2?

9 (Exhibit No. 2, Report, Contaminated Water Supplies at
10 Camp Lejeune: Assessing Potential Health Effects (2009),
11 marked for identification.)

12 Q Dr. Savitz, I'm showing you what's been marked as
13 Exhibit 2. Do you recognize this exhibit?

14 A Yes, I do.

15 Q What is it?

16 A It is the report on Contaminated Water Supplies at
17 Camp Lejeune: Assessing Potential Health Effects, 2009, a
18 report of a committee that I had chaired.

19 Q Let me direct your attention to Roman numeral VI,
20 if we can find that.

21 A Okay.

22 Q Do you see at the top of that page, there is a
23 title the Board -- excuse me -- the Board on Environmental
24 Studies and Toxicology?

25 A Yes.

1 Q And can you tell me if you know how the Board on
2 Environmental Studies and Toxicology is related to this
3 particular report?

4 A It's not -- I don't have a detailed understanding.
5 Boards are different than committees and my general
6 understanding is the boards oversee a portfolio of activity
7 that we fit under -- the committees fit under. There is
8 not a very direct line though or at least my understanding
9 is maybe a little hazy that they have sort of the roles of
10 the board relative to that of the committees.

11 Q So did the Board on Environmental Studies and
12 Toxicology play any role in the research writing or review
13 of this report?

14 A Not in a way that I was aware of. I don't know
15 what obviously was going on within the academy, but from
16 the committee's point of view, there was no interaction or
17 input that I'm aware of from the Board on Environmental
18 Studies and Toxicology.

19 Q If you look at the prior page, page Roman Numeral
20 V, do you see the list of the members and staff of the
21 committee on contaminated drinking water at Camp Lejeune?

22 A Yes, I do.

23 Q Do you know how the members of the committee were
24 selected?

25 A No, I mean in my role as chair, by the time I am

1 engaged, the committee has either largely or completely
2 been constituted, so my only degree of understanding is to
3 know that within the academy, the staff are the ones who
4 identify and recruit participants.

5 Q Do you know how you were chosen to chair the
6 committee?

7 A I don't know directly. There often is some
8 recommendation based on prior work as a committee chair or
9 it certainly never described the process that led them to
10 invite me to serve in that role. There is not a detailed
11 description given, just we think you could be effective,
12 would you be willing to serve.

13 Q Had you been the chair of a National Academy of
14 Sciences committee before this particular assignment?

15 A Yes, I believe so. This is now where the
16 chronology is a little bit unclear, but I'm pretty sure. I
17 need to look at my CV to know for sure, but I believe I had
18 served as a chair of prior committees.

19 Q What were your responsibilities as the chair of
20 the committee?

21 A The main role is to help manage the process in a
22 way that is effective basically in making sure we are
23 focusing on the charge, that there's -- managing the
24 discussion in a way to ensure the best possible product.
25 It's really managerial. It's not -- obviously each

1 individual brings their own expertise and my job is to help
2 marshal that to develop the most helpful report possible.

3 Q Okay. Keep that report in front of you. We will
4 be going back to it several times during this deposition,
5 but I want to have this next item marked as Exhibit 3.

6 (Exhibit No. 3, Getting to Know the Committee Process,
7 marked for identification.)

8 Dr. Savitz, I'm showing you what's been marked as
9 Exhibit 3. Do you recognize this exhibit?

10 A I am not familiar with it. I may have received a
11 copy at some point, but it's not a document I'm familiar
12 with.

13 Q Okay. I will just represent this was among the
14 materials that the National Academy of Sciences produced in
15 this case related to the Camp Lejeune report. Do you see
16 the section on the first page of the document entitled
17 About This Unique Institution?

18 A Yes, I do.

19 Q And do you see this section and particularly the
20 first paragraph of this section discusses the establishment
21 of the National Academy of Sciences and its mission?

22 A I do see that, yes.

23 Q And later on in this paragraph, it refers to the
24 National Academy of Sciences, the National Academy of
25 Engineering, the Institute of Medicine and the National

1 Research Council which are collectively known as the
2 National Academies. Do you see that?

3 A Yes, I do.

4 Q And the report on Camp Lejeune contaminated water
5 was done by the National Resource Council; is that right?

6 A National Research Council.

7 Q Research Council. Thank you. Is that correct?

8 A Yes, it is.

9 Q This paragraph says that the National Academies
10 brings together experts in all areas of scientific and
11 technical endeavor. Do you see that?

12 A I'm sorry, where is that?

13 Q In the middle of the paragraph, it says known
14 collectively as the National Academies, they perform an
15 unparalleled public service by bringing together experts in
16 all areas of scientific and technological endeavor.

17 A I do see that, yes.

18 Q And do you see the next sentence says these
19 experts serve as volunteers to address critical national
20 issues and give unbiased advice to the federal government
21 and the public?

22 A Yes, I do see that.

23 Q And is that consistent with your understanding?

24 MR. TELAN: Form objection.

25 A Yes, it is.

1 Q Do you receive compensation for your services with
2 a National Academy of Science committee?

3 A No, I do not.

4 Q Did you consider your role as a member of the
5 National Research Council Camp Lejeune Committee to give
6 unbiased advice to the federal government and the public?

7 A Yes.

8 Q And what did you understand the term unbiased
9 advice to mean?

10 A To me, it's within the charge, there are certain
11 lines of research that we draw on that are described in the
12 report and the sort of collective obligation of the
13 committee is to relate the knowledge base to the question
14 we have been asked in a way that is not tainted by personal
15 biases or preferences or beliefs, but to provide the
16 requested assessment as objectively as possible.

17 Q If you turn to the third page of the document, do
18 you see a section on Bias and Conflict of Interest?

19 A Yes, I do.

20 Q Can you read the second paragraph of that section
21 into the record?

22 MR. TELAN: I will just object to the form
23 because it speaks for itself. You can answer or read it.

24 A The credibility of a report can be called into
25 question if the committee that produced it is perceived to

1 be biased. Potential sources of bias and conflict of
2 interest are significant issues that are taken into
3 consideration in the selection of committee members and are
4 re-examined periodically throughout the study process.

5 Q Did you consider guarding against perceived bias
6 to be an important part of the committee's work on the Camp
7 Lejeune contaminated water report?

8 A We recognized early on -- this is as the committee
9 work began -- I was less familiar before I got involved as
10 chair -- that this was a very contentious issue, that we
11 learned very quickly there are very strong views on this
12 issue, and it if anything heightened the awareness that we
13 needed to do this by the book, that we would be scrutinized
14 and challenged, whatever we had to say. That's often the
15 case though, that's not always maybe as pronounced as it
16 was in this case, that we will be scrutinized, and if there
17 is bias, it will be discrediting to the process.

18 Q Do you believe that your committee successfully
19 guarded against bias with respect to the Camp Lejeune
20 report?

21 MR. TELAN: Form objection.

22 A Yes, I do, as the -- based on the report itself
23 and the process and the membership of the committee, I
24 believe we were effective in addressing the charge without
25 bias.

1 Q Can you look down at the next section entitled
2 Committee Deliberations? Do you see that?

3 A Yes, I do.

4 Q Can you read the second paragraph of that section
5 into the record?

6 MR. TELAN: Object to the form.

7 A Committees are expected to be evenhanded and to
8 examine all evidence dispassionately. Although all
9 interested parties should be heard and their views given
10 serious and respectful consideration, one of the
11 committee's primary roles is to separate fact from opinion,
12 analysis from advocacy. Scientific standards are essential
13 in evaluating all arguments and alternatives.

14 Q As the committee chairman, did you consider it a
15 primary role of the Camp Lejeune water committee to
16 separate fact from opinion and analysis from advocacy?

17 MR. TELAN: Form objection.

18 A I would say that that is true of all committee
19 members. I don't know that on that, the chair has a unique
20 position, but I certainly would try to adhere to that and
21 believe others did so as well.

22 Q Do you believe that the Camp Lejeune committee
23 successfully fulfilled that role?

24 MR. TELAN: Form objection.

25 A I think we -- based on the information available

1 at the time and on the charge, I believe we did fulfill
2 that role of providing an unbiased evaluation. My only
3 caveat is I recognize that when it comes to this kind of
4 interpretation, another committee that was equally
5 qualified academically may well not have come to exactly
6 the judgment we came to, but to the degree there were --
7 there was anything sort of idiosyncratic or unusual or
8 distinctive about our assessment, it was not to the best of
9 my knowledge based on individual biases in any way.

10 Q Okay. Let me refer you back to Exhibit No. 2
11 which is the report, and if you can look back at page V,
12 page Roman Numeral V. I think you are there already.

13 A Okay.

14 Q And the list of members of the committee are laid
15 out there. Were you familiar with any of the individuals
16 on the committee before this work started?

17 A Yes, I was.

18 Q Were you familiar with all the members of the
19 committee?

20 A No, I wasn't.

21 Q Okay. I would like to ask you if you could very
22 briefly go through the members of the committee and as best
23 you recall what role they played with respect to the
24 committee.

25 A I can try, but honestly, it's been quite a long

1 time. As I said, I know some better than others.

2 Q And I will say before you start there --

3 A Yes.

4 Q -- if you want to refer to page 237 of the report,
5 I believe there's a little bit more of a description of who
6 the individuals were, if that assists you at all.

7 A Give me a moment, if you would.

8 MR. TELAN: Adam, our pagination doesn't have
9 page 237.

10 MR. BAIN: If you look at the one in the --
11 here's an extra copy, Pat.

12 A In Appendix A, it provides the biographic
13 information. Dr. Baier-Anderson is a -- provided primarily
14 information related to toxicology, some broader
15 understanding of environmental health and environmental
16 policy, but mainly as a toxicologist. Dr. Bruckner is a
17 toxicologist. Dr. Clement is an engineer in water quality,
18 groundwater modeling expert. Dr. Kimmel is again a
19 toxicologist and risk assessor. Drs. Laden, Lanphear, Ma
20 and Olshan are epidemiologists, as I am. Dr. Nuckols is an
21 exposure assessment expert overlapping with the water
22 modeling, but has a broader knowledge base in environmental
23 exposure assessment. Dr. Sheppard is a statistician and
24 risk assessor, I would say is her expertise. Dr. Symanski
25 is an epidemiologist and an exposure assessment expert.

1 Dr. Yager is broadly an environmental health scientist and
2 more towards the toxicology end of the expertise.

3 Q As the chair of the committee, did you feel as if
4 you had a well qualified group of scientists to perform the
5 tasks that the National Academy of Sciences was asking the
6 committee to perform with respect to the Camp Lejeune
7 contaminated drinking water report?

8 A Yes, I do. We obviously covered epidemiology,
9 toxicology, water modeling, biostatistics, and those were
10 and are the relevant disciplines for addressing the
11 question we were asked.

12 Q Okay. I would like to ask you to turn back to
13 Roman Numeral V of the report where we were before.

14 A Yes.

15 Q And do you see that the staff for the report is
16 listed there?

17 A Yes, I do.

18 Q And what is your understanding of the role that
19 the staff plays?

20 A The staff -- well, they manage and assist in the
21 development of the report, particularly relating to the
22 project director, in this case, Dr. Martel. They help
23 develop background information. I can't recall for sure,
24 but it's quite common that they would identify the relevant
25 literature, provide the committee with background materials

1 needed, certainly some of the logistics like scheduling
2 meetings, helping us refine the report, but always
3 recognizing the report is the committee's product and they
4 facilitate the committee getting its work done in a wide
5 variety of ways.

6 Q Do you know how the staff of the committee was
7 selected?

8 A I have no idea, no.

9 Q Do you recall what the different -- what roles the
10 different members of the staff played?

11 A Honestly, at this point, I of course remember very
12 clearly the role that Dr. Martel played. Otherwise, I
13 would just have to rely on the descriptions that are
14 provided there of those who were editors and those who
15 helped facilitate travel and so on.

16 Q Do you see on this page where listed as a sponsor
17 is the U.S. Department of the Navy?

18 A Yes, I do.

19 Q And what was the role of the U.S. Department of
20 the Navy as far as you understood it with respect to this
21 report?

22 A From my perspective as the chair, I was aware that
23 they had worked with the academies to generate the
24 statement of task and the only role that they played for
25 the committee was to help clarify what was -- what the

1 question was in a way that we could be most effective in
2 answering, in other words, helping us refine our
3 understanding of the charge as we started on our work.

4 Q Do you know why the U.S. Navy was a sponsor of
5 this particular report?

6 A I mean in broad terms, of course they were
7 interested in addressing the concerns that had developed
8 around the water contamination at Camp Lejeune and were
9 seeking guidance in both evaluating the evidence, but also
10 I think they were clear in sort of the statement of task of
11 scientific issues that -- input that would help them in
12 addressing the concerns.

13 Q Do you know whether this particular report was
14 mandated by Congress?

15 A Again, I -- I -- as I said, it's been a long time,
16 but I -- I'm not sure in this case. It's not uncommon for
17 there to be a recommendation and I honestly just don't
18 remember on this one whether the Navy was responding to a
19 Congressional mandate or just had decided to do so on their
20 own.

21 Q Is some of the work that's done by the National
22 Academy of Sciences mandated by Congress in your
23 experience?

24 A Well, my understanding is it can be mandated by a
25 branch of the government, in other words, Congress gives

1 the marching orders to the other entity and then that other
2 entity might engage us. I suppose it's possible for them
3 to engage the academies directly, but when I have seen it,
4 it's been more -- they require some other government agency
5 to engage the academies in addressing an issue.

6 Q But for this particular report, you don't recall
7 exactly what the circumstances were with respect to
8 Congress and the Navy?

9 A I am not sure. If I had to guess, I would say
10 that I think it was, there was involvement that way, but
11 it's not something that I recall in any detail.

12 Q Did anyone from the U.S. Navy participate in the
13 research or writing for this report?

14 A No, they did not. The only way they would have
15 gotten involved is if we had questions that they could
16 answer, that they were the source for information. The way
17 that process would work is that we would ask the academy
18 staff to make certain queries and then bring us back
19 information insofar as we thought it would help us in
20 fulfilling our charge.

21 Q Do you know whether anyone from the U.S. Navy
22 participated in reviewing the report before it was issued?

23 A I do not -- I'm not aware of that having happened.
24 I mean there's a well-defined process for reviewing draft
25 reports independently and the committee responding to those

1 comments and an oversight that ultimately approves it and
2 I'm not aware of the sponsor having any role at that -- in
3 that -- in that review and release process.

4 Q If you look a couple pages back, this is actually
5 the first page after the title page where the National
6 Academies Press is at the very top of it. Do you see that?

7 A Yes.

8 Q And do you see where there's a statement in the
9 second paragraph there that the project was supported by
10 Contract W81K04-07-C-0005 between the National Academy of
11 Sciences and the U.S. Department of the Navy. Any
12 opinions, findings, conclusions or recommendations
13 expressed in this publication are those of the authors and
14 do not necessarily reflect the view of the organizations or
15 agencies that provided support for this project. Do you
16 see that?

17 A Yes, I do.

18 Q And was that your understanding for this
19 particular report to be the case?

20 A Again, it's -- my understanding is it's general
21 policy that there's that degree of independence in the
22 committee offering its views without oversight at that
23 point by the sponsors.

24 Q Was there any person representing the interests of
25 the United States Government on your committee?

1 A No.

2 Q Was there any person representing the interest of
3 the chemical industry on your committee?

4 A Again, they would be all of them there to provide
5 expertise and not to represent any particular interest
6 group.

7 Q Do you believe that the committee's work on this
8 particular report represented an objective scientific
9 inquiry?

10 A I think that we made a good faith effort to be
11 fully informed and objective in responding to the charge.

12 MR. BAIN: I will have this marked as the next
13 exhibit.

14 (Exhibit No. 4, Summary Data, marked for
15 identification.)

16 Q Dr. Savitz, I'm showing you what's been marked as
17 Exhibit 4. Do you recognize this exhibit?

18 A I recognize the content of it. I don't know that
19 I have seen this form of it.

20 Q And when you say you recognize the content, can
21 you elaborate on that?

22 A I am certainly familiar with the statement of
23 task. It's something that the committee takes very
24 seriously, that is our charge that we need to respond to
25 completely, but not going beyond the charge either.

1 Q And this document is dated September 6, 2006; is
2 that right?

3 A That's correct, yes.

4 Q And I believe this was before your selection as
5 committee chair, is that consistent with your recollection?

6 A I don't remember the exact timing, but my
7 understanding of the process is that the statement of task
8 would always be finalized before committee members would be
9 engaged.

10 Q Is a statement of task something that you reviewed
11 as the committee chair?

12 A Yes, I mean, as I said, it's not just a guideline,
13 it is the task, and so it's something that we all reviewed.
14 In fact, we often begin every meeting of the committee by
15 reviewing it again to make sure that we are focused on the
16 issues that have been put before us.

17 Q Okay. So I would like to ask you to read the
18 statement of task into the record, please.

19 MR. TELAN: I will just object to the form.

20 A A committee of the National Research Council will
21 review the scientific evidence on associations between
22 adverse health effects and historical data on prenatal,
23 childhood and adult exposures to contaminated drinking
24 water at Camp Lejeune, North Carolina. The committee will
25 assess the strength of evidence in establishing a link or

1 association between exposure to trichloroethylene,
2 tetrachloroethylene and other drinking water contaminants
3 and each adverse health effect suspected to be associated
4 with such exposure. For each health effect reviewed, the
5 committee will determine to the extent practicable with the
6 available scientific data: One, whether a statistical
7 association between such contaminant exposures and the
8 health effect exists; two, whether there exist plausible
9 biological mechanisms or other evidence of a causal
10 relationship between contaminant exposures and the effect;
11 three, the strength of evidence for causal inference for
12 each of the health effects; and four, other scientific --
13 other scientific considerations that may help the
14 Department of the Navy prioritize future activities.
15 Excuse me. In the evaluation of previous and current
16 health studies of residents of Camp Lejeune, the committee
17 will review the appropriateness of the study question,
18 design, analysis, results and conclusions.

19 Q Thank you. I think as you stated before, you
20 consider this to be the task of your committee, correct?

21 A That's correct, yes.

22 Q If you turn to the next to last page of the
23 document, actually, the page with the Bates number
24 CLJ199435. Do you see that page?

25 A 435?

1 Q Yes.

2 A Okay.

3 Q And do you see that there is a section there
4 entitled Consideration of Balance which states committee
5 members with relevant knowledge and expertise will be
6 sought from academia, consulting firms, public interest
7 organizations and private enterprise with consideration for
8 appropriate balance?

9 A Yes, I do.

10 Q Do you have an understanding what is meant by
11 consideration for appropriate balance?

12 A I think there's -- in my, again, informal
13 discussions with the staff at the NRC, they are aware of
14 individuals having leanings one way or another. I think my
15 sense is that they try to avoid those who lean too far, and
16 to the degree they can, they try to create a mix where if
17 there is someone that leans one way on a particular set of
18 issues, there will be somebody else who kind of leans a
19 little bit the other way, so that when we come to the
20 consensus at the end, it will be balanced even if not every
21 individual left to their own devices would be perfectly
22 balanced.

23 Q In your view at the time, did the committee on
24 Camp Lejeune water have appropriate balance?

25 A I think it did, yes.

1 Q Do you see on the next page of this document that
2 there's a projected budget?

3 A Yes, I do.

4 Q Were you involved at all in overseeing the budget
5 as the committee chair?

6 A No.

7 MR. BAIN: Can I get this marked as the next
8 exhibit?

9 (Exhibit No. 5, Acceptance Form, marked for
10 identification.)

11 Q Dr. Savitz, I'm showing you what's been marked as
12 Exhibit 5. Do you recognize this exhibit?

13 A Yes, I do.

14 Q Can you describe what this exhibit is?

15 A This is my formal documentation accepting the role
16 as chair of the committee.

17 Q And is that your signature on the document?

18 A Yes, it is.

19 Q And it reflects that you signed this acceptance
20 form on July 27, 2007; is that right?

21 A That's correct, yes.

22 Q And through this acceptance, did you accept the
23 committee's formal statement of task?

24 A Yes.

25 Q And is that the task that we just read from

1 Exhibit 4?

2 A I believe so, yes.

3 Q And did you agree to follow the National Research
4 Council's policies and procedures for committee studies as
5 described in the enclosed pamphlet?

6 A Yes, I did.

7 Q I showed you Exhibit 3 and you weren't recalling
8 that you had seen that before. Looking back at Exhibit 3,
9 is that the pamphlet that's described here or do you think
10 the pamphlet is something else?

11 A Again, I -- I know that there were -- again, there
12 is always printed materials that describe the process that
13 I skim over. Having done a bunch of these, I admit I don't
14 read it cover to cover each time, but I'm not sure your
15 question about whether I was given this or whether -- I
16 assume I was. I don't remember specifically, you know, for
17 this committee having -- what I received. It's been, as I
18 said, a long time.

19 Q Okay. So we have been going about an hour now.
20 Would you like to take a break or would you like to keep
21 going?

22 A I'm okay for a bit.

23 Q Okay. Do you recall receiving a briefing from the
24 U.S. Marine Corps in 2007 at the outset of your work?

25 A Again, by briefing, you mean a presentation, yes,

1 at the first committee meeting, it's quite traditional to
2 hear from representatives of the sponsor both to summarize
3 their -- the reason that they have asked for this and to be
4 available to clarify questions we may have.

5 Q Is there anything in particular that you recall
6 from the presentation that the Marine Corps gave to your
7 committee in 2007?

8 A You know, I don't recall the -- obviously the
9 specific content, but I certainly -- what I do remember is
10 being impressed by the tone of what I would interpret as a
11 sincere desire to have -- to generate the information to
12 help them bring this long simmering issue to some
13 resolution.

14 MR. BAIN: If I could have this marked as the
15 next exhibit.

16 (Exhibit No. 6, Health Study of Volatile Organic
17 Compound-Impacted Drinking Water at Camp Lejeune, marked
18 for identification.)

19 Q Dr. Savitz, I'm showing you Exhibit 6 which is a
20 power point that was in the materials produced by the
21 National Academy of Sciences and is entitled Health Study
22 of Volatile Organic Compound-Impacted Drinking Water at
23 Camp Lejeune, Briefing for National Academy of Sciences
24 Panel, September 24, 2007. Do you see that?

25 A Yes, I do.

1 Q And as far as you can recall, is this power point
2 what we have been referring to as the briefing that the
3 Marine Corps gave to your committee at the outset of its
4 work?

5 A Honestly, obviously it's been quite awhile. I
6 don't remember -- I believe it looks like it would be that,
7 but I can't say that I have enough of a recollection of the
8 content of that talk to vouch for it.

9 Q Okay. I want to direct your attention to slide
10 three that's on the second page. And do you see where that
11 slide is entitled Marine Corps Goal, do you see that?

12 A Yes, I do.

13 Q And do you see where it states determine if past
14 exposure to volatile organic compounds, VOC, impacted
15 drinking water at Camp Lejeune caused adverse health
16 effects in our marines, their families and civilians living
17 and working on the base?

18 A Yes, I do.

19 Q Was that consistent with your understanding of
20 what the Marine Corps desired from the National Academy of
21 Sciences?

22 MR. TELAN: Object to the form.

23 A You know, the charge itself again is very
24 carefully written and my understanding -- this is -- this
25 is a judgment that they wanted to be able to make, but we

1 were not asked to make that assessment. We were asked to
2 compile the evidence that would inform that assessment, in
3 other words, we were not asked, if you will, to deliver a
4 verdict, but rather to assemble the evidence and data that
5 would inform that judgment.

6 Q If you turn to page five of the exhibit and if you
7 look at slide 10 at the bottom of page five entitled
8 Desired Outcome of NAS Study, it is stated here assess the
9 strength of evidence in establishing a link or association
10 between exposures to PCE, TCE and other contaminants in
11 drinking water and each adverse health effect suspected to
12 be associated with such exposure at Camp Lejeune. And
13 there's a parenthetical at the bottom, e.g., determine if
14 it is possible to design a study that will tell people if
15 their health concern was caused by or is associated with
16 exposure at Camp Lejeune. Do you see that?

17 A Yes, I do.

18 Q Again, was that your understanding of what the
19 Marine Corps goal for the National Academy of Sciences
20 study was?

21 MR. TELAN: Object to the form of the question.

22 A Again, it is sort of paraphrasing -- it's
23 certainly consistent with the charge, so in that sense,
24 it's broadly within my understanding, but again, in parsing
25 out the words, which committees like that do very

1 carefully, we obviously interpreted the charge and
2 responded to it to look at what is known about those
3 chemicals based on the broader scientific literature and --
4 and then to speak to the research on the Camp Lejeune
5 population that might answer the parenthetical question, so
6 those were the two realms that we were focusing on.

7 Q Okay. You can put that aside and I will refer you
8 back to Exhibit 2 which is the report and ask you to turn
9 to Roman Numeral XI. And this is the last page of the
10 preface of the report. Do you see that?

11 A Yes, I do.

12 Q And do you see your name listed there at the end
13 of the preface on Roman Numeral XI?

14 A Yes, I do.

15 Q Is that an indication that you drafted the
16 preface?

17 A Yes, as the committee chair, there's an
18 opportunity for all the committee to review it, but that is
19 a part of the report that the chair would be the one to
20 draft.

21 Q Okay. I'm going to ask you about certain language
22 in the preface and then follow-up with questions and I
23 would like to start on page Roman Numeral IX. If you look
24 at the second full paragraph and do you see about halfway
25 down, there's a sentence that starts as directed by

1 Congress?

2 A Yes, I see that.

3 Q Can you read that sentence to the end of the
4 paragraph?

5 A Yes. As directed by Congress, the U.S. Navy
6 requested a study by the National Research Council to
7 review the scientific evidence on associations between
8 historical data on prenatal, childhood and adult exposures
9 to contaminated water at Camp Lejeune and adverse health
10 effects.

11 Q Can you read the next paragraph into the record,
12 please?

13 A In response to the Navy's request, the National
14 Research Council convened the Committee on Contaminated
15 Drinking Water at Camp Lejeune which prepared this report.
16 The members of the committee were selected for their
17 expertise in epidemiology, toxicology, exposure analysis,
18 environmental health, groundwater modeling, biostatistics
19 and risk assessment. See appendix A for biographic
20 information on the members.

21 Q Okay. Finally, I'm going to ask you to read the
22 first sentence of the next paragraph into the record.

23 A To help the committee in its review, meetings were
24 held in September and November, 2007, and September, 2008,
25 to gather information from scientists and those who chose

1 to inform the committee regarding their experiences in
2 relation to the water contamination at Camp Lejeune.

3 Q Can you tell me what you recall about those
4 meetings in September and November of 2007 and September,
5 2008?

6 A There's -- very often the same meeting will have
7 multiple purposes. Certainly the first meeting would have
8 been clarifying the charge and having -- hearing from the
9 sponsors and other interested parties. There is also
10 periods of a closed meeting where the committee
11 deliberates. There may have been that mix of open meeting
12 with input combined with a closed session of deliberation
13 at the second meeting as well. Probably not the third
14 meeting, but again, I have to see the agenda for those to
15 be certain of that.

16 Q Do you recall where the meetings were located?

17 A I remember that the -- again, this has been a long
18 time. Certainly the first one, probably two would have
19 been in Washington at the academy facilities. I believe
20 there was one at Camp Lejeune. The only reason I'm
21 confused about that is that we presented the -- the
22 information from the report at Camp Lejeune, which I think
23 was the second visit there though, I'm pretty sure.

24 Q And can you describe generally what occurs at
25 these meetings where you saw there is certain presentations

1 given and you said there is also a discussion among the
2 committee, sometimes is it with the people who are giving
3 the presentation or is it separate, how does it work?

4 A There is both. When we hear from those who were
5 providing input in one form or another, there's usually an
6 opportunity for the committee to ask questions of them that
7 we believe would be helpful in responding to the charge.
8 After that session, in the closed meeting, we deliberate
9 among ourselves about the scope of the report, the usual
10 sort of internal business, who is going to work on what
11 sections, sort of the -- it's always going from the charge
12 to the report, what needs to happen, what work needs to be
13 done, how do we operationalize that, what will the staff be
14 helping us with and so on, so there's a lot of internal
15 business that goes on there just again to make sure that we
16 are able to complete the report in a timely way.

17 Q Are any of the meetings transcribed by a reporter?

18 A I don't know. I think -- I can certainly -- there
19 may be times that they are recorded if the staff or
20 committee wants to go back and make sure we caught
21 something important. I just don't remember honestly for
22 this committee whether that was done or not. It's not
23 something where we certainly -- I know we didn't get a --
24 you know, sort of a written transcript of the discussion,
25 but there may be some records retained for -- again, for

1 the purpose of referring back as needed.

2 MR. BAIN: Okay. Let's take a break now for the
3 court reporter, if no one else.

4 THE VIDEOGRAPHER: Off the record. 10:13.

5 (A short break was taken.)

6 THE VIDEOGRAPHER: Okay. We are back on the
7 record. 10:23. Media number two. Please proceed.

8 Q Dr. Savitz, before the break, we were talking
9 about some of the presentations and meetings at the outset
10 of your work. You reference in the preface that you heard
11 from Frank Bove and Morris Maslia of the Agency for Toxic
12 Substances and Disease Registry. Do you recall that?

13 A Yes, I do.

14 Q Do you recall the presentations that those
15 scientists gave to you?

16 A Again, in broad terms, they were describing the
17 research that they had been doing and intended to do
18 regarding the health experience of the Camp Lejeune
19 population.

20 Q After those initial presentations, did you have
21 any further communications with Dr. Bove or Mr. Maslia?

22 MR. TELAN: Object to the form.

23 A I -- I don't recall. As I said, the general
24 process if we did would have been for us to communicate
25 that to the project director at the academies who would

1 communicate back to them and bring us information back. I
2 honestly don't recall whether or not that happened with
3 those individuals.

4 Q During the course of the committee's work, do you
5 recall having any communications with Dr. Chris Portier,
6 director of the Agency for Toxic Substances Disease
7 Registry?

8 A I don't recall. I just have to leave it at that.
9 I'm not sure if we had input from him directly during the
10 committee's deliberations or not.

11 Q At the time you were working on the committee,
12 were you familiar with Dr. Portier?

13 A I had -- very indirectly, I had known his advisor
14 at the University of North Carolina, and again, it wasn't a
15 personal familiarity, but it was an awareness of who he
16 was.

17 Q Since the time of completion of your work on the
18 committee, have you had any occasion to work with Dr.
19 Portier?

20 A I have not.

21 Q At these initial presentations and meetings, did
22 you hear from any Camp Lejeune residents, either current or
23 former residents of the base?

24 A Yes, we did.

25 Q What do you recall about that?

1 A I recall the -- the personal stories of what could
2 only be described as just catastrophic health issues that
3 had occurred to them or their families that made the
4 committee aware of how -- how sensitive this issue was.

5 Q Were you aware that there was a Camp Lejeune
6 Community Assistance Panel that was working with the Agency
7 for Toxic Substances Disease Registry?

8 A Yes, I was.

9 Q Do you know what role that Community Assistance
10 Panel was playing?

11 MR. TELAN: Form objection.

12 A Not precisely. I mean again, I -- you know, no, I
13 should just say I don't know specifically other than
14 obviously sort of providing a liaison of some kind between
15 the affected community, the community of concern and the
16 research activities going on.

17 Q In particular, do you recall any presentations
18 that were given either by Jerry Ensminger, Mike Partain or
19 Lori Freshwater?

20 A I recall Jerry Ensminger.

21 Q What do you recall about that?

22 A That he was very passionate about these issues. I
23 believe he had had a daughter with leukemia, if I'm not
24 mistaken, and that he was a very forceful advocate for
25 addressing health concerns at Camp Lejeune.

1 MR. BAIN: Mark this as Exhibit 7.

2 (Exhibit No. 7, Presentation to the National Academy
3 of Sciences, marked for identification.)

4 Q Dr. Savitz, I'm showing you what's been marked as
5 Exhibit 7 and I will represent again this is among the
6 materials that the National Academy of Sciences produced
7 related to the work on this report. Do you recognize
8 Exhibit 7?

9 A Again, I have no direct recollection at this
10 point, but I accept that it's as indicated there, a
11 presentation made to the committee.

12 Q Do you recall Mr. Ensminger making a power point
13 presentation to the committee?

14 A I do recall the fact that that happened, again,
15 the general tone of the content, but nothing more specific
16 than that.

17 Q When you say the general tone, what do you recall
18 about it?

19 A That he was very I would say troubled by his
20 personal experience and I did remember that he held views
21 that the -- that the Navy had not been responsive or honest
22 in their handling of the issues. In broad terms, that's
23 what I recall.

24 Q Well, on the first page of Exhibit 7, do you see
25 that there is a slide which states the Marine Corps knew

1 for years that the drinking water at Camp Lejeune was
2 heavily contaminated, do you see that?

3 A I do see that, yes.

4 Q Did you consider that fact that was presented to
5 you relevant to the work that the committee was doing?

6 A We -- again, we parse out the charge, the
7 statement of task, and we were not asked to make judgments
8 of that nature regarding the -- the historical record and
9 what was known when and how that was managed, so it
10 provides context and helped make the committee aware of the
11 magnitude and the intensity of the concern, but was not
12 something that we -- was within the scope of our charge to
13 address.

14 Q Okay. And then if you look at the page that has a
15 Bates number ending in 82 at the bottom, do you see the
16 slide at the bottom of that page which says the ATSDR was
17 well aware that TCE is hazardous to human health, both
18 toxic and carcinogenic, in both children and adults, and
19 ATSDR public health assessments were factually incorrect
20 and ignored or incorrectly characterized the adverse human
21 health effects of TCE exposure in adults and children. Do
22 you see that?

23 A I see where it says that, yes.

24 Q Was that information relevant to the work that the
25 committee was doing?

1 MR. TELAN: Object to the form.

2 A Again, I think that we were receptive to input
3 that would help us appreciate the evidence. We were
4 sensitized to the need for careful communication about what
5 was within the scope of our charge and not within the scope
6 of our charge. Insofar as there was -- it was primarily
7 the latter though that was the takeaway message that we got
8 from it is we need to be clear and this -- it is important
9 that this not -- if there is anything that our committee
10 could do to bring closure to this issue in a way that would
11 be helpful to the residents, that that is a potential
12 service we could provide within the scope of our report.

13 Q Do you understand what point Mr. Ensminger was
14 trying to make through this particular slide?

15 MR. TELAN: Form objection.

16 A I am not exactly sure when he refers to ATSDR
17 public health assessments, so no, I'm not sure exactly what
18 that refers to.

19 Q Did you get the impression at the time that
20 Mr. Ensminger was trying to influence the committee's work?

21 MR. TELAN: Form objection.

22 A Again, I think that as a committee member, I was
23 certainly -- it was clear that there would be certain
24 conclusions that would be more or less welcomed by those
25 who had strong beliefs about what had happened and what the

1 impact had been. That's often the case in fact. And part
2 of the process that -- the committee's contribution is to
3 be aware of that, but to again approach it based purely on
4 what the evidence provides and recognize, as I said, that
5 not everybody will agree with us at the end.

6 Q What was your impression of what conclusions would
7 be most welcome by Mr. Ensminger and other residents who
8 gave presentations to the committee?

9 MR. TELAN: Object to the form.

10 A Again, my impression was that there was a desire
11 for some kind of indication that -- again, which was not
12 within our charge and maybe beyond the bounds of what
13 science can provide, but was looking for some
14 acknowledgment that -- that there had been disregard of
15 health concerns by the Marine Corps and that in fact the --
16 that the exposures that resulted were the cause of the
17 adverse health experiences that he and others had had.

18 Q You referenced earlier that the committee had two
19 visits to Camp Lejeune; is that right?

20 A I believe so. I believe we had one regular
21 committee meeting there and then it was really after the
22 report was completed and released that we made a
23 presentation at Camp Lejeune for those who were there and
24 interested.

25 Q Do you recall the meeting that was held at Camp

1 Lejeune initially, what occurred at that meeting?

2 A I do not. I think, you know, if I have the
3 sequence right, there was some opportunity to sort of
4 physically be in -- sort of become familiar with the water
5 treatment plant and the facilities and the general living
6 arrangements there. As I said, again, I should -- I wish I
7 could recall more accurately, but I definitely recall being
8 there and staying there for I'm pretty sure it was a
9 meeting and not just the final one.

10 Q Did it involve then a tour of the base, did you
11 see certain parts of the base?

12 A Yes, that would have been -- one of the purposes
13 was to see the physical layout of things at the base.

14 Q So you mentioned the water treatment plants and
15 places where people lived; is that correct?

16 A Again, that's my very general recollection. As I
17 said, it's been a long time.

18 Q Do you recall whether the committee stayed
19 overnight at Camp Lejeune?

20 A I do recall that, yes.

21 Q So stayed overnight on base?

22 A Yes, that's correct, at the -- what was called --
23 I remember because I'm unfamiliar with the military, but
24 the bachelors officers quarters and that was where we were
25 housed.

1 Q And did you dine at the officers club, do you
2 recall?

3 A I believe we did, yes.

4 Q Do you believe that staying on Camp Lejeune or
5 dining at the officers club compromised the objectivity of
6 the committee in any way?

7 MR. TELAN: Form objection.

8 A No, we were -- I do recall the sort of accusation
9 that we had been somehow -- I don't know -- that the travel
10 amenities would somehow bias us, but I -- I can't speak for
11 all the committee members, but it was -- they were
12 perfectly fine hosts, but it was no -- it was not something
13 that we considered a major perk of being on the committee
14 by any means, at least for myself. I don't think that
15 would have been true for others either.

16 Q I apologize if I already asked this, but aside
17 from the conferences that you had and meetings, do you
18 recall any communications with ATSDR scientists during the
19 preparation of the report?

20 MR. TELAN: Form objection.

21 A Again, they presented. We may have had follow-up
22 questions to clarify, but those would have all been through
23 very formal channels. In other words, we would formulate
24 the question, Dr. Martel or others would reach out to the
25 investigators and report back the information. There was

1 no other kind of informal contact or -- we recognized that
2 in situations like this, it all needs to be done in a way
3 that is appropriate.

4 Q So there wouldn't have been, for example, e-mails
5 between ATSDR scientists and individual members of the
6 committee outside of formal channels?

7 A I can say that I would -- there should not have
8 been. I honestly don't know if individual committee
9 members chose to do otherwise, but when it's an important
10 part of the input to the committee's deliberations, I
11 certainly -- I personally certainly recognize the need to
12 be thoughtful and make sure we are doing this in a way that
13 is not going to look in any way biased.

14 Q And I have the same questions with respect to
15 communications with Mr. Ensminger and Mr. Partain or Ms.
16 Freshwater, do you recall any communications with any of
17 them other than the initial presentations that were made?

18 A They may have provided -- one or more of them may
19 have provided some supplemental materials that would have
20 been compiled just as part of the record. I know that
21 there's a process for doing that and therefore warned it
22 will become public information, but if they choose to
23 provide that, it will be made available to the committee.

24 Q So other than those type of supplemental
25 submissions, are you aware of any communications either

1 formal or informal that those individuals had with you or
2 any other members of the committee?

3 A I am not aware of any such communication.

4 Q In the context of putting together this report or
5 any other report that you do with the National Academy of
6 Sciences, are you familiar with the terms that are used,
7 review draft and final draft?

8 A No, I mean I certainly know the spirit of it and I
9 know that there is a -- there are various rounds of editing
10 and input, that the committee completes its work and there
11 is technical editors who go through and help refine the
12 language, clarify points, it goes out to review at some
13 point to external reviewers, it's further revised, and even
14 after that, there may well be further sort of technical
15 editing, not for content, and I just don't know what they
16 name each of those phases.

17 Q Did the committee with respect to this particular
18 report divide up the work that was necessary to complete
19 the initial draft of the report?

20 MR. JOHNSON: Object to disclosure of academy
21 deliberations.

22 A I'm sorry, I couldn't hear that if I needed to.

23 MR. TELAN: This is what we sought to guard
24 against at the front end of the deposition because
25 nonparties according to the stipulated order that I

1 referenced and I have not marked -- but I will now mark as
2 an exhibit to the deposition, the next number -- nonparties
3 are not to participate. We have not yet received an order
4 from the judge on the motion, so participation by the
5 National Academy of Science is in direct violation to
6 paragraph nine of the order that we referenced previously.

7 (Exhibit No. 8, Stipulated Rule 30 Deposition
8 Protocol, marked for identification.)

9 Q I'm going to try to make it a little easier and I
10 don't want to get into any internal deliberations as to who
11 was going to do what or how it was decided who would do
12 what, but was there a division of labor with respect to
13 drafting of different parts of the report?

14 A There is always a division by the expertise
15 obviously, if there's a chapter on toxicology, it's the
16 toxicologist who would be doing the initial work, and same
17 on epidemiology or water modeling. There is discussion
18 back and forth. I can describe the general process, you
19 know. Ultimately, it's the collective report of the
20 committee, but obviously there's a range of expertise and
21 there's -- so yes, it would be based on discipline as the
22 initial work.

23 MR. TELAN: Given the rephrasing of your
24 question, I would inquire as to whether or not there is
25 coordination between the Department of Justice and the

1 National Academy lawyers who are present here today with
2 regard to the questions being asked of Dr. Savitz.

3 MR. BAIN: Well, I will just note for the record
4 that I'm aware of what the National Academy of Science
5 privilege is and I'm trying not to impinge on that
6 privilege. When you get around to your opportunity to ask
7 questions, we will see what happens. Does that answer your
8 question?

9 MR. TELAN: Not really.

10 MR. BAIN: Well, I know what their privilege is
11 and I'm trying not to broach that privilege.

12 Q Do you recall when the first draft of the report
13 was completed?

14 A I do not.

15 Q Okay. The preface references meetings held in
16 September and November of 2007 and then a subsequent
17 meeting in September of 2008. Would the initial draft of
18 the report have been completed before the September, 2008,
19 meeting as far as you know?

20 A Again, I can mainly react -- I don't remember for
21 this committee, but having done a number of others, that
22 would typically be the pattern of an orientation and
23 outside input at the first meeting, sometimes another one,
24 and then the final meeting is where we would come around to
25 making the -- the important -- draw the important

1 conclusions. The degree to which that is written at that
2 point varies. It's not necessarily a full draft report.
3 It may be an overview of our understanding of where we are
4 headed and that there will be more writing and revision
5 that would follow, but obviously as the committee goes
6 through the process, as you get to the later meetings,
7 it's -- it's -- it is trying to reach closure on the major
8 conclusions.

9 MR. BAIN: Mark this as Exhibit 9.

10 (Exhibit No. 9, Letter, 8/9/07, Quarterly Report,
11 marked for identification.)

12 Q Dr. Savitz, if you can take a look at Exhibit 9,
13 do you -- take your time to leaf through it a little bit.
14 Do you recognize Exhibit 9?

15 A No, this is -- this is part of the process. I
16 would expect that it goes on in dealings between the
17 sponsor and the NRC, but it's not something that involves
18 the committee at all.

19 Q So this is a report from the project director to
20 the sponsor describing the progress on the committee's
21 work, but you are not involved in providing information for
22 this or reviewing it; is that right?

23 A That's correct.

24 Q And do you see that the reports are submitted to
25 the U.S. Army Center for Health Promotion and Preventative

1 Medicine?

2 A I see where it says that, yes.

3 Q Do you know why the reports are presented to this
4 particular organization or agency?

5 MR. TELAN: Form.

6 A No, I do not.

7 Q Okay. Let's go back to Exhibit 2 which was the
8 report itself and the preface. If you go to Roman Numeral
9 X of the preface, and if you look at the next to last
10 paragraph that begins the committee members, do you see
11 that?

12 A Yes, I do.

13 Q Can you read that paragraph into the record?

14 A The committee members devoted substantial effort
15 to the development of this report through rounds of
16 discussion, deliberation, writing and rewriting. They came
17 to their task with a wide variety of perspectives based on
18 disciplinary training, research pertaining to the chemicals
19 and health effects of concern and ideology, but all shared
20 a commitment to bring the best knowledge possible to bear
21 on important health issues and to assist the sponsor and
22 former Camp Lejeune residents by offering an assessment and
23 a scientific perspective that can help to bring this
24 long-standing and sometimes contentious concern closer to a
25 resolution.

1 Q As you testified previously, you wrote the
2 preface, including that statement?

3 A Again, I drafted it, yes.

4 Q And do you stand by the statements that you just
5 read?

6 MR. TELAN: Form objection.

7 A Yes, I do.

8 Q When the committee completed the review draft of
9 the report, was the committee in agreement with the
10 opinions, findings, conclusions and recommendations of the
11 report?

12 MR. TELAN: Form objection.

13 A There are -- there's a fairly formal process for
14 reaching that level of closure where, again, an agreement
15 is probably the right phrase. What we mean by a consensus
16 is not that we would choose exactly the same wording in
17 every place, but that overall, we are standing by the
18 committee report in its totality and there's even a process
19 of signing off and approving that before it goes forward.

20 Q Was the draft sent to another group of scientists
21 for further review?

22 A Again, standard process at the academy is that
23 when the report is ready for external review, it is sent to
24 a number of individuals for input. I should note the
25 committee doesn't know who it is going to. We may talk

1 about the kinds of experts by discipline that it should go
2 to. It usually parallels the expertise of the committee
3 itself. Again, we receive anonymous input from those
4 reviewers and then work with the staff and the committee to
5 take those concerns or suggestions into account to finalize
6 the report.

7 Q Can you look at the first full paragraph on Roman
8 Numeral X and read the first two sentences into the record?

9 A This report has been reviewed in draft form by
10 persons chosen for their diverse perspectives and technical
11 expertise in accordance with procedures approved by the
12 National Research Council's Report Review Committee. The
13 purpose of the independent review is to provide candid and
14 critical comments that will assist the institution in
15 making its published report as sound as possible and to
16 ensure that the report meets institutional standards of
17 objectivity, evidence and responsiveness to the study
18 charge.

19 Q When it says there that it ensures the report
20 meets the institutional standards of objectivity, evidence
21 and responsiveness to the study charge, can you elaborate
22 what that means?

23 MR. TELAN: Form objection.

24 A I mean it's obviously going to be interpreted by
25 each of those individuals, but objectivity to refer to

1 whether we have identified and assessed the relevant
2 evidence without bias, without leaning one way or another,
3 that we have compiled the relevant evidence and that we
4 have responded fully to the charge, but not gone beyond the
5 charge. And it's also -- again, within all of that is
6 whether it's clear in the report how we ended up where we
7 ended up. It can be -- I don't know -- it's a little off
8 message -- it's not unusual to get input that would say,
9 well, I would have come to a different conclusion, which is
10 of course expected and maybe correct, but they are
11 evaluating sort of the description of the committee's
12 deliberations, reasoning and conclusions to see if it all
13 comes together.

14 Q And if you look at the bottom part of that
15 paragraph where it says we thank the following, can you
16 read that to the end of the following?

17 A Yes, we thank the following for their review of
18 this report, John L. Adgate, University of Minnesota, Mary
19 P. Andersen, University of Wisconsin, Richard Clapp, Boston
20 University, Mary C. Hill, U.S. Geological Survey, Margot
21 Krauss, consultant, Lawrence H. Lash, Wayne State
22 University, Rosalind A. Schoof, Integral Consulting, Inc.,
23 Michael A. Stoto, Georgetown University, Clifford Weisel,
24 University of Medicine and Dentistry of New Jersey, and
25 Raymond S. Yang, Colorado State University.

1 Q Do you know how those individuals were selected to
2 review the report?

3 A No, not directly. Again, it's hard for me to
4 remember whether that's true at each committee, but
5 sometimes the project director will ask for ideas on people
6 that they might consider as reviewers. Certainly it's
7 clear by what kinds of disciplines need to be represented,
8 but there will be an offering of suggestions, but again, we
9 never know if they did or didn't choose them or if they did
10 or didn't agree to provide a review.

11 Q Do you know who they will be in advance or is it
12 only after they have done the review that you know who they
13 are?

14 A I'm sorry, what's that?

15 Q Do you know who the individuals will be in advance
16 of soliciting them or is it after the review that you find
17 out who they are?

18 A We don't find out until -- not only have the
19 requests been made, the reviews have been received, all we
20 know is there's reviewer A, B, C, et cetera. And until the
21 report is finalized, we have no idea who they are, so
22 there's no communication, no bias, if you will, even on our
23 part by, you know, trusting one reviewer over another. As
24 I recall, in writing the preface, I initially leave it as
25 to be named and then the information is provided by the

1 project director very late in the process.

2 Q So when the committee receives the comments from
3 the reviewers, you don't know who they are. Do you know
4 what their expertise is or anything like that?

5 A You can infer it, I mean that's -- we don't know
6 who they are. I mean sometimes we may have guesses, we may
7 be right or wrong, but they will often zero in in much
8 greater detail in the aspects of the report in which they
9 have expertise. That's pretty predictable.

10 Q Are you aware of whether any of the reviewers that
11 are listed here are government employees or represent the
12 interest of the government or the Navy?

13 MR. TELAN: Form.

14 A You know, I can only look at their affiliations
15 and I have no other insight into their -- their activities.
16 I suppose the U.S. Geological Surveys is somewhere within
17 the government, but that would be the only one where the
18 affiliation makes it obvious.

19 Q Do any members of the committee or peer reviewers
20 receive any type of compensation or honorary from the
21 National Academy of Sciences?

22 A Not to the best of my knowledge.

23 Q Is there any incentive as far as you know for
24 committee members or peer reviewers to recommend further
25 studies by the National Academy of Sciences to seek

1 additional funding for the NAS?

2 MR. TELAN: Form.

3 A Certainly not directly. I mean it's not unusual
4 to note future research issues or questions that remain
5 unresolved or at least maybe hint at other issues that
6 could be productively addressed, but it's certainly not
7 anything that would be direct.

8 Q Do you know whether the National Academy of
9 Sciences takes any steps to ensure that the peer reviewers
10 don't have any conflict of interest related to the outcome
11 of the report?

12 MR. TELAN: Object to the form.

13 A I don't know the screening process for that. I
14 assume they would be avoiding those who have a strong, you
15 know, preconception about what the -- about these issues or
16 some sorts of bias, but again, I don't know what the formal
17 vetting process is.

18 Q Have you ever served as a peer reviewer for a
19 National Academy of Sciences report?

20 A Yes, I have.

21 Q Do you have to make any type of representation
22 about conflict of interest or bias when you serve as a peer
23 reviewer?

24 A I do not believe so, but again, I don't recall
25 for -- with certainty. I don't recall there being a formal

1 process for that.

2 Q Can you read the next paragraph into the record?

3 A Although the reviewers listed above have provided
4 many constructive comments and suggestions, they were not
5 asked to endorse the conclusions or recommendations, nor
6 did they see the final draft of the report before its
7 release. The review of the report was overseen by the
8 review coordinator, George M. Rusch, Honeywell, Inc., and
9 the review monitor, George M. Hornberger, Vanderbilt
10 University. Appointed by the National Research Council,
11 they were responsible for making certain that an
12 independent examination of the report was carried out in
13 accordance with institutional procedures and that all
14 review comments were carefully considered. Responsibility
15 for the final content of the report rests entirely with the
16 author committee and the institution.

17 Q So do those two paragraphs -- the first two
18 paragraphs on page Roman Numeral X provide a fair
19 description of the review process for the report as you
20 recall it?

21 A Yes, they do.

22 Q And the preface there refers to a final draft. Do
23 you see that?

24 A Yes, I do.

25 Q Was a final draft circulated for review, do you

1 recall?

2 A Do you mean review by the committee?

3 Q Review by the committee or by any outside
4 entities, for example, the Navy, the ATSDR or members of
5 the Community Assistance Panel.

6 A I don't know with certainty, but I do not believe
7 so. I know there can be different input from other members
8 of the National Research Council asking colleagues or
9 others to look at issues or other technical editing, but as
10 far as I know, any sort of external review is what's
11 described in the -- in the preceding paragraph.

12 Q Do you recall getting any type of comments before
13 the report was issued from the Navy, the ATSDR or any
14 community member seeking a change in the findings, opinions
15 or conclusions of the report?

16 A I don't recall receiving any input prior to the
17 report itself being issued from any of those parties.

18 Q Okay. If you look down to the last full paragraph
19 in the preface that starts the report focuses, do you see
20 that?

21 A Yes, I do.

22 Q Can you read that first sentence into the record?

23 A This report focuses on what scientific evidence
24 can say about the causal relationship of past exposures and
25 health outcomes.

1 Q When it refers to past exposures, what is your
2 understanding of the past exposures that are being
3 referenced?

4 A The statement is in a sense generic about
5 historical exposures and whether in -- essentially in
6 retrospect those have caused particular health problems.

7 Q Okay. Can you read the next two sentences into
8 the record?

9 A It is important to understand the difference
10 between how scientific evidence is used in this context
11 compared to how it is used in the context of regulatory
12 risk assessment and prevention. We should be clear that
13 the evaluation we conducted was not for the purposes of
14 regulatory risk assessment and the prepublication version
15 of this report may not have made this distinction clear
16 enough to all readers.

17 Q Why was it important to understand the difference
18 between how the scientific evidence is used in the context
19 of understanding what can be said about a causal
20 relationship of past exposures and outcomes and how the
21 evidence is used in the regulatory context of risk
22 assessment?

23 A We were trying to distinguish between inferring a
24 causal relationship between an exposure and a health
25 outcome and making some judgment about what acceptable

1 levels of exposure would be, so that, as I recall,
2 specifically avoiding the sense that -- that if there is
3 not, you know, clear evidence of a causal effect, that
4 somehow that means these exposures were without harm and
5 should be considered acceptable, in other words, it was no
6 way in forming judgments about what would be a safe level
7 of exposure.

8 Q And when you talk about the safe level of
9 exposure, is that what is the view of doing a regulatory
10 risk assessment?

11 MR. TELAN: Form.

12 A The purpose of a risk assessment is to at least
13 provide the best estimate of a level that is safe with
14 respect to adverse health events with appropriate margins
15 of safety and so on.

16 Q Okay. You next quote a statement from the 2003
17 Institute of Medicine report on Gulf War and Health, volume
18 2. Do you recall what the purpose was in quoting that
19 statement?

20 A I do not.

21 Q Can you take a minute to read it to see if that
22 refreshes your recollection?

23 A I mean I can read it and say why one might put
24 such a statement into the report. And again, it is back to
25 the distinguishing between regulatory decisions and

1 interpreting what's happened in the past. Obviously
2 regulatory decisions are prospective, we are saying going
3 forward, we may use information from the past, but it's in
4 going forward. I don't recall clearly the nature of that
5 misinterpretation as it was bearing on this report. My
6 reference from that paragraph being included and what
7 precedes it is there must have been real concern about
8 misinterpreting the purpose of our evaluation.

9 Q Let's turn to the first part of the report which
10 is entitled Public Summary and Context starting on page
11 one.

12 A Okay.

13 Q And what's the purpose of having an initial
14 section in the report entitled Public Summary and Context?

15 A It's not always done, but we thought in this case
16 that a more accessible version of the committee's report at
17 least in summary form would be helpful given the -- the
18 many interested parties, including nontechnical experts.

19 Q Okay. If you go down to the second paragraph here
20 and do you see the sentence that starts because of the
21 technical nature of the report, can you read starting there
22 to the end of the paragraph?

23 A Because of the technical nature of the report,
24 this public summary is being provided to explain the
25 committee's approach and reasoning so that people who are

1 not scientists can understand what was done and why. It
2 attempts to place the committee's analysis and findings
3 into the context of a larger discussion about environmental
4 health issues at Camp Lejeune in a way that will be helpful
5 to people who have personal concerns about the situation at
6 the base. It also provides perspective on why the
7 committee was unable to answer some questions.

8 Q And again, you thought that having that statement
9 in this entire chapter of the report was important given
10 the nature of the issues that you were addressing?

11 MR. TELAN: Form objection.

12 A We -- through the public comments, we came to
13 appreciate that there may have been expectations of the
14 report that would not be met and that we would somehow give
15 an acceptable final judgment about all the issues that were
16 unresolved at Camp Lejeune and this was an attempt to make
17 sure that it was clear what the report did and did not do,
18 again, to make sure that there weren't unmet expectations.

19 Q The next section of the report is entitled The
20 Charge To The Committee. Do you see the second paragraph
21 where you say that the charge had several elements?

22 A Yes.

23 Q Can you read that paragraph to describe what those
24 elements were?

25 A The charge had several elements. One was to

1 review the scientific evidence about the kinds of adverse
2 health effects that could occur after exposure to TCE, PCE
3 and other contaminants. The second was to evaluate studies
4 that were performed or that are underway on former
5 residents of the base and to consider how useful it will be
6 to conduct additional studies. The third element was to
7 identify scientific considerations that could help the Navy
8 set priorities on future activities. The responsibility of
9 the committee was to address its charge in a dispassionate,
10 expert and unbiased way. Analyses and findings were
11 neither subject to oversight nor influenced by the agenda
12 of any of the entities with responsibilities for Camp
13 Lejeune, former or current residents of Camp Lejeune or any
14 other entity.

15 Q And in your mind, what was the purpose of that
16 last sentence?

17 A It was trying to provide a disclaimer that we were
18 not -- we had heard from a variety of entities, but we were
19 acting as an independent committee of scientists to respond
20 to our charge. And it may sound a little bit defensive,
21 but we were certainly aware there were misperceptions
22 that -- that we would be something other than objective in
23 evaluating the evidence because of the -- the degree of
24 interest from outside -- from the others listed there.

25 Q I'm not sure I understand the last part of that

1 answer. You said there was a perception of what?

2 A There was an awareness that we were hearing strong
3 views especially from the former or current residents. We
4 were also aware of course that the sponsorship was from the
5 Department of the Navy and thought it was important to
6 clarify that we were not being swayed or influenced in any
7 way by either of those entities.

8 Q And the next section is entitled Concerns Of
9 Former Residents and Workers, correct?

10 A That's correct, yes.

11 Q What was the purpose of having that section, as
12 you recall?

13 A We felt it was important to be respectful of the
14 concerns that had been raised, that these were not being
15 dismissed or ignored given the intensity of the concerns,
16 the very unfortunate health outcomes that some of these
17 individuals had experienced. We were trying to be in the
18 communication of the report, as I said, respectful and
19 sensitive about the experience of the former residents who
20 had spoken to us.

21 Q And along those lines, in the middle of this
22 section, do you see the paragraph that starts many of the
23 people who addressed the committee have suffered from
24 serious diseases or have family members or friends who have
25 suffered. The committee was moved by the testimonies it

1 heard and understands that some may have been looking for
2 the committee to make a judgment on their particular case.
3 Do you see that?

4 A Yes, I do.

5 Q Can you read the next sentence in the paragraph
6 into the record?

7 A However, science does not allow the committee to
8 determine the cause of a specific case of disease. This
9 may be hard to understand. You want me to go further,
10 continue?

11 Q Yes, to the end of that paragraph.

12 A Okay. Why would scientific experts not be able to
13 determine whether a child's birth defect or a parent's
14 cancer diagnosis was due to a chemical exposure?
15 Unfortunately, for diseases that can have multiple causes
16 and that develop over a long period of time, it is
17 generally impossible to establish definitively the cause in
18 individual cases. It was beyond the scope of the
19 committee's charge to try to determine whether any
20 particular case of a disease or disorder is associated with
21 exposure to the water supply at Camp Lejeune.

22 Q And from your perspective as committee chair, what
23 was the purpose of that paragraph?

24 A We were trying to clarify that -- again, the word
25 definitive is critical there -- that we would not be -- we

1 were not charged with doing so and there would -- you know,
2 that it's not possible to provide 100 percent certainty
3 about any given health problem. Obviously what the
4 committee did and what always can be done is to inform a
5 judgment at the end about how probable or improbable it may
6 be, but that we were not going to be declaring something
7 that your -- what you have suffered is due to the exposures
8 at Camp Lejeune. That was not what we were asked to do and
9 that was not something that we as a committee were prepared
10 to address.

11 Q Okay. The next sentence is entitled the
12 Committee's Review and Findings. Do you see that?

13 A Yes.

14 Q And it said the committee divided its review into
15 two major categories: One, evaluating the exposure of
16 former residents and workers to the contamination of the
17 Tarawa Terrace and Hadnot Point water supply systems; and
18 two, evaluating the potential health effects associated
19 with the water contaminants. Do you see that?

20 A Yes, I do.

21 Q So the committee looked at both potential
22 exposures to contaminants and potential health effects; is
23 that right?

24 A That's correct, yes.

25 Q With respect to exposure, generally, what were the

1 contaminants of concern and the pathways of exposure that
2 the committee considered?

3 A The primary emphasis in the charge as it was
4 presented at that time was regarding trichloroethylene and
5 perchloroethylene, TCE and PCE, I believe the phrase was
6 and other chemicals in the water. And I think the report
7 addresses we became -- we were aware of some other
8 chemicals of concern, benzene, vinyl chloride, other
9 products that -- that chemical transformations occurred, so
10 that we were -- that was our understanding though was there
11 was a weight towards TCE and PCE as the greatest concerns.

12 Q And what pathways of exposure did the committee
13 consider?

14 A It was really -- it was through the drinking water
15 supply. Now that includes both ingestion, and for volatile
16 compounds, inhalation in bathing or showering, but that the
17 focus was on the water supply itself.

18 Q Did the committee consider the results of water
19 modeling that had been done by the Agency for Toxic
20 Substances Disease Registry to make estimates of
21 concentrations of contaminants in the water supply in the
22 decades preceding the detection of those contaminants?

23 A As I mentioned, we did have groundwater modeling
24 expertise represented on the committee, and through that
25 assessment, they were -- they did examine what had been

1 done and made some assessments about potential for future
2 work and so on. It's obviously a big part of the report.

3 Q If you can turn to page four and if you look at
4 the next to last paragraph that begins sophisticated
5 computer modeling. Can you read that paragraph into the
6 report?

7 A Sophisticated computer modeling techniques were
8 used by ATSDR to make predictions about the monthly
9 concentrations of PCE to which residents of Tarawa Terrace
10 were exposed. To provide perspective on its estimates,
11 ATSDR compared its monthly estimates with the U.S.
12 Environmental Protection Agency, EPA, maximum contaminant
13 level, MCL, for PCE in drinking water of 5 micrograms per
14 liter which was established in 1985. The model estimated
15 that starting in November, 1957, the concentration of PCE
16 delivered to residents exceeded that MCL and remained well
17 above it until the wells were closed in 1985.

18 Q Was a comparison of the ATSDR monthly estimates to
19 the EPA's MCL that was established in 1985 relevant to the
20 committee's work?

21 MR. TELAN: Form objection.

22 A Yes, it was. It was a way of recognizing that we
23 were well in the range where there are -- there's a strong
24 basis for concern of adverse health effects, we are in a
25 range of serious concern.

1 Q Because of the exceedance of the MCL?

2 A Well, that's a benchmark of what's considered an
3 acceptable regulatory limit and so being above that puts it
4 in a range where, again, there are concerns regarding
5 adverse health consequences.

6 Q Okay. The next section is entitled Potential
7 Health Effects on page five. Do you see that?

8 A Yes, I do.

9 Q Can you read the introductory paragraph into the
10 record?

11 A The committee undertook four kinds of reviews to
12 determine what kinds of diseases or disorders, adverse
13 health effects, have been found to result from exposure to
14 TCE and PCE. One, review of epidemiologic studies of
15 solvents and their effects, including studies in
16 occupational and industrial settings and community studies.
17 Two, review of epidemiologic studies of other communities
18 with solvent contaminated water supplies. Three, review of
19 toxicologic studies conducted in animals and humans to test
20 for health effects of TCE and PCE. And four, review of
21 studies conducted specifically on the Camp Lejeune
22 population.

23 Q Thank you. Before I move on further with that, I
24 wanted to go back for a minute. Did the committee rely
25 upon the results of the ATSDR's water modeling in its work?

1 A When you say rely on it, I'm not sure -- again, it
2 would have to be related to the specific part of the
3 charge, which itself was to evaluate the work that had been
4 done, so we certainly included an evaluation of it in that
5 sense were -- relied on the results. We were not using it
6 to make our own independent inferences about adverse health
7 effects.

8 Q And with respect to the potential health effects
9 that you just read, there, you mention just TCE and PCE.
10 Previously, you said other VOCs were under consideration;
11 is that correct?

12 A Again, the weight of the review was towards those
13 two chemicals which was consistent with the charge and it
14 is of secondary interest, but we did not do a methodical
15 review of the literature on benzene or vinyl chloride or
16 other specific chemicals that they may have been exposed
17 to. We did in some cases consider literature on solvents
18 as a class, but mainly focused on those two chemicals.

19 Q And can you elaborate why the committee did not
20 look at, for example, the degradation products of TCE and
21 PCE such as vinyl chloride and DCE?

22 MR. TELAN: Form.

23 A Again, we were responding to the charge and
24 interpreted that, you know, specifically and narrowly in
25 relating it to the literature, again, based on what we knew

1 at the time.

2 Q So the charge had referenced TCE and PCE
3 specifically; is that right?

4 A That's correct, yes.

5 Q And was there any consideration of looking into
6 benzene in more detail?

7 A That was not something that had come up in the
8 course of the report other than where it is mentioned, you
9 know, one of the other chemicals that had been found in the
10 water.

11 Q Was the committee aware at the time that there had
12 been some literature showing that vinyl chloride was
13 associated with liver tumors?

14 A I don't recall what was -- whether the
15 committee -- if the committee was aware of that. It
16 certainly even at that time was a well established
17 relationship that -- but I don't recall that coming up in
18 our discussions.

19 Q And the same question with respect to the
20 relationship between benzene and AML, a particular type of
21 leukemia, was the committee aware that there was literature
22 establishing that relationship?

23 A I don't recall. Again, it was -- it was
24 well-known in the scientific community at that time, but I
25 don't remember if it was something that was explicitly

1 addressed by the committee. I would have to look in detail
2 at the report where we mention those chemicals.

3 Q Were you as the committee chair concerned at the
4 time by addressing just TCE and PCE and the ultimate
5 finding of the committee that no disease had a greater than
6 limited or suggested evidence of association might be
7 misleading the public given conclusions that other agencies
8 had made regarding vinyl chloride and benzene?

9 MR. TELAN: Object to the form of the question.

10 A I'm sorry, I'm not sure I'm following the parts of
11 that.

12 Q Okay. We just talked about how there had been
13 some diseases related to vinyl chloride and benzene that
14 were established in the literature at the time and your
15 charge was narrowly focused on TCE and PCE. Were you
16 concerned that the committee's conclusions might be
17 misinterpreted given that narrow focus?

18 A I don't recall being concerned at that time,
19 again, in the context of the charge that -- that it was
20 clearly predominantly reporting on those particular
21 chemicals. I don't -- again, I don't recall the committee
22 sort of -- again, we addressed and we touched on the other
23 chemicals, but I don't -- if we had had -- in the context
24 of the charge, obviously if we had a different view, we
25 would have written the report differently. We thought we

1 were being responsive and clear, you know, in regard to why
2 the focus on those chemicals and the attention that was
3 given to the others. I can't tell you in hindsight whether
4 that was right or not, but certainly we thought about our
5 charge and whether we were being fully responsive to it, as
6 did the reviewers.

7 Q As part of your review of the epidemiological
8 literature, I understand that the committee first
9 considered a review that had been done by the Institute of
10 Medicine in 2003; is that right?

11 A That was part of the background material that was
12 provided to us.

13 Q And when you say that was provided to you, who
14 provided that to you?

15 A The NRC staff.

16 Q Okay. And was that done at the committee's
17 request or was that done without the request of the
18 committee, do you know?

19 A I don't recall, but I believe it was even in the
20 charge to build out from that earlier report. I don't
21 recall whether that was just provided or whether we
22 requested it. I don't recall that.

23 Q Okay. With respect to the Institute of Medicine's
24 2003 review, there's a reference to box one on page six
25 which is the five categories used by the Institute of

1 Medicine to classify associations. Do you see that?

2 A Yes, I do.

3 Q And those are the categories that Institute of
4 Medicine used in their analysis in 2003; is that right?

5 A That's correct, yes.

6 Q And did your committee use the same
7 categorizations in your review?

8 A Yes, we did.

9 Q And was there any discussion about -- let me
10 change that.

11 Why did the committee decide to use the
12 categorizations that were used by the Institute of Medicine
13 in 2003?

14 A I think that we recognized that we needed to --
15 that we needed to address a spectrum of evidence across the
16 different outcomes and that had been very similar to the
17 work that was done on the Gulf War and Health Reports which
18 were quite extensive and quite detailed. And we believed
19 as a committee that adopting this framework -- first of
20 all, there was a precedent for it. We were not making up
21 something new. It had been -- I believe it was I think
22 seen as useful and fit the purpose of our evaluation.

23 Q What is your understanding of the role of the
24 Institute of Medicine?

25 A I'm sorry, broadly?

1 Q Yes, broadly, what does the Institute of Medicine
2 do, is it another part of the National Academy of Sciences?

3 A Well, it's renamed the National Academy of
4 Medicine, so -- and it has these sort of -- again, I'm
5 giving my general understanding. It is both an
6 organization that elects members, it's in a sense honorary,
7 there are meetings, it's sort of a network of senior
8 scientists. It also advises through the NRC process,
9 generates these reports. So the Institute of Medicine at
10 the time was -- again, the title made it seem solely like
11 the honorary membership, elected to the Institute of
12 Medicine, and then in making it the National Academy of
13 Medicine, it made it parallel more clearly to the National
14 Academy of Sciences and the National Academy of
15 Engineering.

16 Q Okay. The first category in this box is
17 sufficient evidence of a causal relationship. Can you read
18 that category into the record?

19 A Yes. Sufficient evidence of a causal
20 relationship. Evidence from available studies is
21 sufficient to conclude that a causal relationship exists
22 between exposure to a specific agent and a specific health
23 outcome in humans, and the evidence is supported by
24 experimental data. The evidence fulfills the guidelines
25 for sufficient evidence of an association, below, and

1 satisfies several of the guidelines used to assess
2 causality, strength of association, dose-response
3 relationship, consistency of association, biologic
4 plausibility and a temporal relationship.

5 Q At the time your committee did its work on this
6 report, were you familiar with -- was the committee
7 familiar with the Bradford Hill considerations for
8 determining whether a causal relationship exists between an
9 exposure and a disease?

10 A I don't remember if those were named specifically,
11 but clearly in the terminology and the description that
12 appears there, it's drawing on the considerations of Hill.

13 Q Okay. And you have recognized the considerations
14 of Hill in some of the work you have done, right?

15 MR. TELAN: Form.

16 A Yes, I have.

17 Q Including in your recent book on Epidemiology and
18 the Law?

19 A That's correct, yes.

20 Q At the time the committee did the work, did you
21 believe that the Bradford Hill considerations were an
22 appropriate basis for assessing whether positive
23 associations in epidemiological research determined whether
24 the research supported a causal relationship between a
25 exposure and a disease?

1 MR. TELAN: Object to the form.

2 A I don't recall the -- I mean when we adopted this
3 framework to work with in addressing our charge, it was
4 implicitly of course sort of modeled after the Hill
5 criteria. I honestly don't recall extended discussion or
6 any discussion that sort of -- other than the choice to
7 adopt this, so it was more implicit, as I recall, than any
8 sort of explicit debate.

9 Q Would you agree that the sufficient evidence of
10 causal relationship category reflects application of most
11 of the Bradford Hill considerations?

12 A Yes, as I said, they are very parallel. I don't
13 know if it has all of them in it or not. I think Hill had
14 nine, but this is certainly consistent with the -- most of
15 the considerations.

16 Q It is stated on page five of the report that the
17 Institute of Medicine categorized the evidence according to
18 an established scheme accepted by the Department of
19 Veterans Affairs in evaluating veterans of the Vietnam War
20 and the Gulf War; is that correct?

21 A That's correct, yes.

22 Q Are you aware whether that scheme in any way gives
23 a benefit of the doubt to the veteran in placing diseases
24 into one of these categories?

25 MR. TELAN: Object to the form.

1 A I'm not sure, again, what you mean by the benefit
2 of the doubt. I know they have their own sort of decision
3 rules for what is a sufficient basis. I'm not familiar
4 with that in fine detail, but I'm certainly aware that such
5 guidelines have been developed.

6 Q And are you aware whether those guidelines looks
7 at the evidence in a way that gives the benefit of the
8 doubt to the veteran as far as placing diseases and
9 establishing a relationship between a toxic exposure and a
10 disease?

11 MR. TELAN: Object to the form.

12 A Again, I'm broadly aware -- this is independent of
13 the report now -- that there is a fairly generous algorithm
14 for making the assessment that a -- that a condition is
15 service related.

16 Q And when you say a generous algorithm, can you
17 elaborate on that at all?

18 A What I mean is the degree of sort of scientific
19 proof. In other words, when we make judgments like this,
20 it's for a particular purpose and I can understand
21 philosophically why there would be one benchmark set for
22 that, maybe a different benchmark for regulatory decisions,
23 and I'm sure there is different benchmarks in legal
24 settings as well as you look at that spectrum of certainty
25 and that -- that framework was modeled after -- was sort of

1 motivated by the Veterans Administration needing to make
2 decisions about service related health issues.

3 Q Are you able to explain how the algorithm in that
4 context might differ from the way it's used in a legal
5 setting given your experience as an expert in legal cases?

6 MR. TELAN: Object to the form.

7 A Again, I have experience in legal cases. I'm not
8 an expert on the -- the interpretation that way, but
9 it's -- in legal settings where there's -- at least in
10 other cases I've been involved with -- this question of
11 more probably than not and I understand what that means.
12 In other situations, it can be lower or higher thresholds
13 than that or at least as probable -- I think in the case of
14 the VA, I think it -- my impression is it's somewhat less
15 than that, but then I'm sure there are other areas where
16 it's much more, you know, demanding.

17 Q Okay. If you look at the category Sufficient
18 Evidence of an Association, can you read that into the
19 record.

20 A Sufficient Evidence of an Association. Evidence
21 from available studies is sufficient to conclude that there
22 is a positive association. A consistent positive
23 association has been observed between exposure to a
24 specific agent and a specific health outcome in human
25 studies in which chance and bias, including confounding,

1 could be ruled out with reasonable confidence. For
2 example, several high quality studies report consistent
3 positive associations, and the studies are sufficiently
4 free of bias, including -- including adequate control for
5 confounding.

6 Q How would you describe to a layman the difference
7 between those first two categories?

8 A I think that the second category, an association
9 is that there's been a relationship observed, statistical
10 correlation in a sense between this exposure and outcome,
11 and we have at least gotten to the point where we are
12 convinced that it's not an obvious artifact of some
13 methodologic problem, that there really is -- they do go
14 together. It's elevating a step up then to say and it all
15 makes sense. This is what I think that's maybe a loose way
16 of describing it, but not only do we see an association,
17 but based on what we have seen in animal studies, this
18 would be, you know, a reasonable to infer causality, it
19 makes biological sense, it's a substantial -- you know,
20 it's a strong relationship, it follows a graded response,
21 it is sort of -- it's on that continuum, this is -- there
22 are a series of factors that make it more likely to be
23 causal as you go up that -- up that step.

24 Q Okay. So the sufficient evidence of an
25 association, you have enough evidence that there is a real

1 association there; is that right?

2 A That there's a statistical association that we are
3 rather confident exists.

4 Q And it's not random or confounding or something
5 like that?

6 A That's right, nothing obvious that explains it.

7 Q And then to bump it up to the highest level, as
8 you said, it makes sense with respect to these other
9 factors that are mentioned here?

10 A That's correct, yes.

11 Q If you look at the very last sentence on page six
12 going over to page seven, I'm wondering if you can read
13 starting with that statistical association to the end of
14 the paragraph.

15 A A statistical association, however, does not
16 establish that the chemicals cause the diseases or
17 disorders. Continue?

18 Q Uh-huh.

19 A Judgment about the quality of each study and
20 additional supporting evidence from other studies are
21 needed. Statistical associations are often represented by
22 numeric estimates known as relative risks or odds ratios.
23 The estimates describe the relative frequency of disease in
24 groups with higher exposures compared with groups with
25 lower or no exposure. For example, in a study in which

1 individuals are classified as either exposed or unexposed,
2 a relative risk of 2 means that exposed people in the study
3 were twice as likely to develop the disease as people who
4 were not exposed.

5 Q Based on that statement, would you agree that an
6 odds ratio of at least 2 would be necessary to say that any
7 particular individual's disease is at least as likely as
8 not caused by an exposure than by some other factor?

9 MR. TELAN: Object to the form of the question.

10 A That's not what that is conveying there. Again,
11 that's a very separate issue. I use that as -- we, the
12 committee, use that as the illustration. We could have
13 just as easily used 1.5 or 3 or some other number. In
14 other words, it was just to keep the language simple, the
15 risk is twice as high. That's a completely separate issue,
16 sort of this attribution of causality that we did not
17 address, and again, as a committee, we were not asked to
18 address.

19 Q Can you describe generally how the committee
20 evaluated the statistic -- excuse me -- strike that.

21 Generally, can you describe how the committee
22 evaluated statistical associations in the studies that it
23 reviewed?

24 A Well, again, I think it's described in there as
25 the general process, assembling the array of relevant

1 studies and looking at the results of those studies and
2 determining whether there was, you know, consistent support
3 for a positive association being present.

4 Q Okay. Can you turn to page 134 of the report?

5 And do you see the chapter entitled Review of
6 Epidemiologic Studies?

7 A Yes, I do.

8 Q And directing your attention to the section on
9 Evaluating the Epidemiologic Literature.

10 A Yes.

11 Q Can you look at the second sentence regarding
12 statistical associations?

13 A Is that in the last full paragraph on the page?

14 Q Yeah, last full paragraph.

15 A Second sentence, in our review, a statistical
16 association does not imply that the measure of association
17 is statistically significant or causal, only that an
18 association of potential interest has been reported.

19 Q Can you continue to the end of the paragraph?

20 A Okay. The committee reviewed the conclusions of
21 each study in light of its strengths and weaknesses, taking
22 into account the strength of the association, the magnitude
23 of the OR or RR estimate, the influence of exposure
24 measurement error, selection bias, statistical precision,
25 and confounding bias. The coherence of the epidemiologic

1 evidence was then assessed and an assignment made to a
2 category of association.

3 Q Does this describe a standard method of reviewing
4 epidemiologic literature?

5 A I think that the considerations we listed there
6 are standard in the sense that they are -- these are the
7 concerns or considerations that would bear on the judgment.
8 There are different ways of making that judgment at the
9 end. There are more formal and less formal algorithms and
10 procedures, but I think that the content of the
11 decision-making framework is standard in epidemiology.

12 Q When you say there are more formal algorithms, can
13 you elaborate on that a little bit?

14 A Again, this is -- I don't know if we discussed
15 that in the report. There are formal ways of synthesizing
16 the studies, meta analyses, other -- other ways of
17 approaching the data, but -- so it's only to recognize that
18 we describe our reasoning, others may use a different
19 approach, but I think they would have many of the same
20 elements.

21 Q Was your approach or the approach that the
22 committee followed in any way unusual?

23 A I don't think so, no.

24 Q And if you turn to the next page, we see the five
25 categories again that we looked at in the introductory

1 chapters. Do you see that?

2 A Yes, I do.

3 Q We have already talked about the first two
4 categories. I want to move to the next category. Can you
5 read the category on Limited/Suggestive Evidence of an
6 Association into the record?

7 A Okay. Evidence from available studies suggests an
8 association between exposure to a specific agent and a
9 specific health outcome in human studies, but the body of
10 evidence is limited by the inability to rule out chance and
11 bias, including confounding, with confidence. For example,
12 at least one high quality study reports a positive
13 association that is sufficiently free of bias, including
14 adequate control for confounding. Other corroborating
15 studies provide support for the association, but they were
16 not sufficiently free of bias, including confounding.
17 Alternatively, several studies of less quality show
18 consistent positive associations and the results are
19 probably not due to bias, including confounding.

20 Q Can you describe in laymen's terms the distinction
21 between that category and the one where you have sufficient
22 evidence of an association?

23 A The main distinction there is the degree to which
24 there is a -- there is evidence of an association that is
25 not due to methodologic issues or chance or random error,

1 and that at the higher of those two, the sufficient
2 evidence of an association, it's the volume of research and
3 the certainty of a statistical association being present is
4 simply greater. Again, the adjectives I think describe it.
5 Limited or suggestive evidence means that it's been
6 observed, it isn't dismissible, it isn't that there is a
7 blatant error that says the study is not good, but there is
8 not persuasive evidence that it is accurate in providing
9 that measure of association. It's obviously -- these are
10 all trying to anchor something that follows a continuum,
11 and by articulating it, we at least believe we can be
12 consistent internally and that we can be consistent with
13 the work that was done on the Gulf War reports.

14 Q Okay. Thank you. And can you then read into the
15 report the category Inadequate/Insufficient Evidence to
16 Determine Whether an Association Exists?

17 A Evidence from available studies is of insufficient
18 quantity, quality or consistency to permit a conclusion
19 regarding the existence of an association between exposure
20 to a specific agent and a specific health outcome in
21 humans.

22 Q And the report, as we referred to previously, said
23 that this scheme had been accepted by the VA in evaluating
24 risk to veterans of the Vietnam and the Gulf War, right?

25 A I believe that is the case, yes.

1 Q Were you personally aware of how this
2 classification scheme was established when the committee
3 wrote this report?

4 A I was only aware that we were borrowing something
5 that had been used previously. I was not aware of how the
6 original scheme was established.

7 Q Were you aware of what the methodology that the
8 Institute of Medicine used when it reviewed the
9 epidemiological literature and classified it according to
10 one of these categories?

11 A I mean other than the wording that is used in the
12 categories, I'm not aware of sort of an algorithm for
13 applying it beyond bringing expert judgment to bear on
14 which category it fits into, as we did.

15 Q So do you know whether the methodology or
16 algorithm that you used was consistent with what the IOM
17 had used when it did its work?

18 MR. TELAN: Form.

19 A Again, within the bounds of any committee is going
20 to interpret these criteria subject to its own opinions and
21 expertise, but the assumption is that by following this
22 framework, that we would be under -- undertaking it in a
23 similar way to what was done for the Gulf War reports.

24 Q Okay. And you refer to the Institute of Medicine
25 looking at the epidemiologic literature for

1 trichlorethylene, perchloroethylene and solvent mixtures as
2 of 2003 and placing diseases in one of these five
3 categories based on its review, right?

4 A Yes.

5 Q And what source materials did the committee
6 consider that contained the Institute of Medicine's
7 classification of the epidemiologic literature in placement
8 of the evidence in one of these five categories?

9 A The report was mainly used to sort of anchor where
10 things stood as of the time of that report so we would not
11 need to go back and review the entire body of earlier
12 studies and we were then able to focus on what has been
13 learned since, so I would say that we were informed by what
14 judgments they had come -- come to in 2003, we weren't
15 bound by them, and it gave us sort of a benchmark of where
16 things stood so that we could look at the incremental
17 knowledge in the intervening years as we described there.
18 It was also a -- we felt a nice relatively succinct way to
19 describe the process.

20 Q So did the committee just have the IOM's 2003
21 report or did it have any of the working materials,
22 studies, notes underlying the report?

23 A We had the report itself, which was really quite
24 complete with tables and -- it's a big detailed document.
25 We didn't have anything beyond that.

1 Q Okay. I direct you to page 26.

2 A Okay.

3 MR. TELAN: You said 26?

4 MR. BAIN: Page 26.

5 Q If you see the second to last paragraph, about
6 halfway through, do you see where it says the committee
7 updated?

8 A Yes.

9 Q Can you read that to the end of the paragraph?

10 A The committee updated IOM's review, modified
11 categorizations where appropriate, reviewed literature on
12 pregnancy outcomes in the women exposed during pregnancy, a
13 population excluded from IOM's review because pregnant
14 women are not deployed, and expanded on IOM's approach by
15 explicitly considering how evidence from the animal
16 literature adds to the weight of evidence and by
17 considering the exposures that were likely to have occurred
18 at Camp Lejeune.

19 Q And when you reference the modified
20 categorizations where appropriate, I wonder if you can
21 describe what that means. I take it it doesn't mean you
22 changed the categories, but changed placement of diseases
23 in the categorizations where appropriate or --

24 A I think what -- again, I'm having a little trouble
25 deciphering it. I think what we meant was we would

1 reassign as appropriate, not that the category definitions
2 were being modified, but that in 2003, it may have fit in
3 one category, and in 2008, we may have decided it fit in a
4 different category.

5 Q Okay. Do you recall what methodology the
6 committee used to expand on IOM's approach by considering
7 how evidence from animal literature added to the weight of
8 evidence?

9 A We -- again, our committee had extensive input
10 from the toxicologists. There's a number of them and
11 they -- there's a lot of background information, and so I
12 think in making the -- in interpreting the epidemiology, we
13 believed we had maybe put a greater weight on the
14 importance of animal studies to help make the judgment.
15 It's not a -- it's not explicitly in the -- in the
16 definitions of those categories, but it was a -- I think a
17 consideration that was used in -- in making the final
18 assessment.

19 Q And with respect to expanding the methodology to
20 consider exposures that were likely to have occurred at
21 Camp Lejeune, what do you mean by that or what did the
22 committee mean by that?

23 A I think that, again, it certainly gave us a focus
24 on which particular chemicals. I am -- beyond that, I'm
25 not sure. I understand the question is what in particular

1 about the exposures there affected our assignment of the
2 chemical and I'm really not sure beyond the single-minded
3 focus on TCE and PCE.

4 Q Could it have included, you know, giving
5 particular consideration to community studies that might be
6 similar to exposures at Camp Lejeune as well as studies
7 that had been done up to that time of Camp Lejeune itself?

8 MR. TELAN: Object to the form.

9 A I think that in -- we certainly took account of
10 community studies as being more analogous to the Camp
11 Lejeune situation than studies of industrial workers, let's
12 say. I'm not sure that's what we meant there, but I think
13 that the -- again, we considered the quality of the studies
14 and the applicability of the studies and it's the latter
15 that would be influenced by the Camp Lejeune situation.

16 I was going to ask about a lunch break at some
17 point.

18 Q Yeah, that's okay. I was just thinking about that
19 myself.

20 MR. BAIN: So I think it's about noon right now
21 and it's a good stopping point if you all are good with
22 that.

23 THE VIDEOGRAPHER: Off the record. 11:59.

24 (A lunch break was taken.)

25 THE VIDEOGRAPHER: We are back on the record.

1 1:07. Media number three. Please proceed.

2 Q Dr. Savitz, we are back now after lunch and you
3 appreciate you are still under oath?

4 A Yes.

5 Q Going back to the report and looking at page five
6 and over to page six, we were talking about the review of
7 the epidemiological literature. The report says the
8 committee identified new studies published from 2003 to
9 2008 and considered whether they changed the conclusions in
10 the IOM report. These studies included people exposed in
11 occupational situations and in community settings; is that
12 correct?

13 A I'm trying to locate where we are.

14 Q I'm sorry, starting at the bottom of page five,
15 the last word on that page is the.

16 A Okay. Yep. Oh, there it is. Okay, yes, I see
17 where you are at now. That is correct.

18 Q And what was the methodology the committee used to
19 identify new studies?

20 A I believe we got help from the NRC staff in doing
21 a literature search, you know, in the usual ways through
22 various databases and cross-referencing and so on.

23 Q Are you able to say whether that methodology was
24 the same one that the IOM used in initially categorizing
25 the diseases?

1 MR. TELAN: Object to the form.

2 A I don't know. Again, I assume it was either the
3 same or similar. The technology evolves over time, but in
4 either case, it would have been looking for all the
5 relevant studies.

6 Q Was the animal literature and the Camp Lejeune
7 exposure information integrated into the methodology for
8 categorizing the diseases?

9 A The animal studies were integrated in. Again, to
10 clarify, we are talking about these assignments into these
11 groups?

12 Q Yes.

13 A Yes, not the Camp Lejeune studies per se, which
14 actually, at that time, there was not evidence from those
15 studies that would have helped anyway. In other words, it
16 would have been treated, if anything, as just another study
17 in the literature, the way studies of industrial workers
18 and other communities would have been, it would have
19 contributed to the overall assessment, but there weren't
20 studies that made that contribution.

21 Q Do you know whether the committee's methodology
22 for categorization of diseases differed at all from the
23 methodology that the IOM used in its categorization of
24 diseases?

25 MR. TELAN: Object to the form.

1 A Again, I don't have -- I don't have any insight of
2 what the earlier committee had done other than to know that
3 we were -- we were using the same language. I don't know
4 how they interpreted it.

5 Q In categorizing the diseases into these different
6 categories and applying the methodology that your committee
7 used, was the need for replication among studies an
8 important consideration?

9 A Well, again, if you look at the written criteria,
10 again, it's a little bit convoluted, but where we ended up
11 in the limited and suggestive was either one high quality
12 study or several studies -- I'm quoting now -- of less
13 quality showing consistent positive associations, so that
14 that wouldn't have been negated by a negative study, but it
15 was looking for either one high quality or multiple lower
16 quality studies pointing in the same direction.

17 Q And which category are you looking at right now?

18 A I'm looking at the limited/suggestive evidence of
19 an association.

20 Q In categorizing the diseases, did the committee
21 consider that a single report of an association or even
22 sporadic findings of an association among a number of
23 studies do not prove that exposure causes disease?

24 MR. TELAN: Object to the form.

25 A Again, the criteria are pretty explicit about what

1 it takes to rise to the highest level of sufficient
2 evidence for a causal relationship and we tried to stick
3 with that as our standard for putting it into that bin.

4 Q So with respect to sufficient evidence of a causal
5 relationship, having isolated findings or sporadic findings
6 would not allow you to put a disease into that category,
7 right?

8 A That would be correct.

9 Q In reviewing the literature, did the committee
10 consider stronger associations between exposure and
11 diseases more indicative of causation than a weaker
12 association?

13 MR. TELAN: Object to the form.

14 A Again, it's -- as I said -- indicated in the
15 criteria, strength of the association is one of the
16 considerations in getting into the highest level. I think
17 across the board, there's enough latitude that all other
18 things equal, we certainly would have put more weight on a
19 study that found a strong positive association than a weak
20 one, that is just part of the overall constellation of
21 evidence.

22 Q As part of that constellation, did the committee
23 consider that a gradient of increasing risk of disease with
24 increasing exposure as a factor supporting the causal
25 inference?

1 MR. TELAN: Object to the form.

2 A Again, in that -- to reach into the highest level,
3 that's something that's mentioned explicitly, but it's
4 implicit in the other levels as well, in other words, that
5 even in the lowest of the positive categories, limited and
6 suggestive, they talk about studies suggest an association.
7 Well, we would interpret that to certainly include it's a
8 stronger suggestion if there's a graded dose response than
9 if there's not a graded dose response, so it was one of the
10 considerations overall.

11 Q And did the committee consider the need for
12 ancillary support from laboratory supports in understanding
13 the biological processes by which an exposure may cause a
14 disease as a necessary support for a causal inference?

15 A Again, as we indicated there, we did take into
16 account the biological evidence in making the assignment
17 into those categories.

18 Q You discussed principles such as replication,
19 strength of association, dose-response gradient and
20 ancillary support in a number of the epidemiologic books
21 that you have written; is that true?

22 A That is true, yes.

23 Q Did the committee consider a systematic critical
24 evaluation of the evidence essential in its categorization
25 of the diseases?

1 A I'm not sure. Again, it depends on how you are
2 using the word systematic. It's come to mean a very
3 specific technology. We -- I believe we were systematic in
4 that we certainly made an effort to apply the same standard
5 of evidence across the different outcomes to be internally
6 consistent and consistent with the descriptions in those
7 categories, so it was methodical, it was, you know, we
8 believe done with objectivity, but as I said, over time --
9 and I don't even know if that was true at that time -- the
10 word systematic evidence review have come to take on a very
11 specific algorithm.

12 Q What does it mean currently?

13 A Currently, it's got a lot of elements to it. It's
14 the documentation of the literature search algorithm. It
15 can mean abstracting the evidence from the studies, you
16 know, blinded to the outcome. Again, it's not something I
17 do routinely, but it means a very specific process for
18 describing and integrating the evidence often leading to a
19 formal meta analysis, pooled risk estimates and so on, so
20 that's why -- that's the only reason I say that it was
21 systematic, but it was not according to the present day
22 algorithm that is sometimes used.

23 Q How would -- what would the difference be between
24 how the term is currently used and what you or your
25 committee did for this report?

1 A I think that we -- we were systematic in just the
2 normal usage of the term systematic. What I'm contrasting
3 it with, it's become a little bit of a code word, which
4 again, I may or may not be supportive of, but it's become a
5 code word for a particular approach, whereas in the past,
6 it just meant what it means in English, being systematic,
7 being consistent across the categories and, you know,
8 making sure -- doing our best to make sure we had all the
9 evidence, those sorts of informal -- you know, that
10 informal sort of meaning of the term systematic.

11 Q And has the formal meaning of the term come about
12 since 2009?

13 A I -- I am not sure. I think that the widespread
14 application has grown over time, but I'm not sure honestly
15 the sort of origins and how it evolved into the terminology
16 that it came to -- what it's come to mean today. It's
17 often used in capitals, systematic evidence review is
18 sometimes -- yeah, it's become a rather formal term.

19 Q You mentioned previously that you believe it was
20 the staff of the NRC that went about compiling the
21 literature for review; is that right?

22 A I believe they identified the relevant studies,
23 you know. Again, I may be sort of inferring that or -- I
24 don't recall specifically, but that's typically the way
25 it's done for these committees. Certainly if members of

1 the committee know of studies, they can put them into the
2 pool, but there's -- it usually -- it always includes a
3 database or multiple database searches to be -- to make
4 sure we have captured the studies we are interested in
5 capturing.

6 Q And once the literature is compiled, would I be
7 correct in assuming it was the epidemiologist on the
8 committee who would be reviewing that literature?

9 A That's right, you know, let's say we found -- you
10 know, again, we started with the IOM 2003 review and
11 assessment -- the review is probably the most important
12 part there -- where we accepted that they had identified to
13 the best of our knowledge all the relevant studies. We
14 would compile the studies that had occurred since that time
15 between 2003 and 2008 and as a group or, you know, some
16 different individuals would take the lead, we would look at
17 that evidence and say, okay, where is it now, where does it
18 stand now in 2008. Obviously if you were going -- you
19 could ask where does it stand now in 2024, you know, and it
20 certainly may well be a different answer, but that was at
21 least the intention and it was -- the epidemiologist
22 experts on the committee -- and there were a number of
23 us -- would contribute to that.

24 Q Were you personally involved in reviewing the
25 literature?

1 A As an epidemiologist, yes. In other words, sort
2 of we have been talking about my role as committee chair
3 and that has certain attributes, but I'm also a member of
4 the epidemiology group evaluating the epidemiologic
5 evidence.

6 Q And would it be fair to say that it was a group of
7 epidemiologists who reviewed the evidence, not just one of
8 the single epidemiologists on the committee?

9 A That would be correct, yes.

10 Q And did the classifications in the report reflect
11 the consensus of the committee?

12 MR. TELAN: Object to the form.

13 A Ultimately, yes. I mean in other words, that's
14 something that is -- everybody gets to weigh in on that,
15 look at it. We go back and forth. We try to make sure we
16 are being internally consistent, that we are all in general
17 agreement, and there's some fine tuning involved, I mean,
18 again, as the committee discusses it, but it ultimately
19 reflects a consensus of the committee, yes.

20 Q As the chairman of the committee, did you consider
21 it preferable to have several members of the committee
22 involved in reviewing the epidemiologic literature rather
23 than just a single individual?

24 A I think in general, as a committee chair, you --
25 we have to balance individual expertise with the collective

1 nature of a consensus report, and ultimately, it needs to
2 sort of reflect the expertise that each of us brings, but
3 then blend it all together into the expertise that the
4 committee brings, so it would be -- I think it's pretty
5 safe to say that there would be -- one individual would not
6 make any final decisions. They may take the lead and take
7 a first cut at it and lead to more discussion, but they are
8 not going to be sort of turned loose to issue a report that
9 then would just be adopted automatically. There is more
10 deliberation than that. I mean that to me is the -- one of
11 the key values of a committee as opposed to even any one
12 very thoughtful hard working individual, it's the
13 collective wisdom of the group that comes out at the end.

14 Q Let's talk a little bit more about the committee
15 work and specifically what it did and didn't do. I
16 understand that it looked at the relationship between a
17 number of health outcomes and TCE and PCE and solvent
18 mixtures; is that right?

19 A That's correct, yes.

20 Q Do you know how the particular health outcomes
21 that were studied were chosen?

22 A I mean it may have started from the IOM 2003
23 report, but we were interested in all health outcomes that
24 had been studied epidemiologically in relation to these
25 chemicals. We weren't constrained -- we were focused on

1 particular chemicals. We weren't necessarily focused on
2 particular outcomes other than where the literature led us.

3 Q There are -- particular outcomes that I noticed
4 were not included and the two that I have noticed are
5 immunotoxicity and adverse birth outcomes. Are you aware
6 that those weren't included and do you have any explanation
7 for that?

8 A You know, I don't -- again, at this point, I just
9 don't recall a discussion of should we or should we not.
10 There was -- again, as I said, if anything, it would be
11 based on what were the studies that were available at that
12 time that would lead to their inclusion or non -- not
13 including them, but I don't honestly know of any other
14 consideration other than what research had been done on
15 those topics.

16 Q Okay. If you turn to page eight of the report,
17 there's a Box 2 that reflects the Categorization of Health
18 Outcomes Reviewed in Relation to TCE, PCE or Solvent
19 Mixtures?

20 A Yes.

21 Q And does that reflect ultimately the conclusion of
22 the committee on where those particular diseases fit within
23 the categories?

24 A Yes, I should go back and correct, when you said
25 adverse birth outcomes, obviously those are in there. I

1 thought we had -- and I probably should have referred to
2 the table, but you see under insufficient --
3 inadequate/insufficient, miscarriage, pre-term birth, fetal
4 growth restriction.

5 Q Okay.

6 A Et cetera.

7 Q So those are categories of adverse birth outcomes?

8 A That's right, that's what I would mean by that,
9 yes.

10 Q The other one was immunotoxicity. Is that
11 considered an adverse effect as far as, you know, in your
12 discipline?

13 A It is. I'm just looking through the list there to
14 see if there was any -- and at the time, we did not
15 consider it. I don't know -- again, I don't recall it
16 being a strategic choice or a judgment. It just must --
17 presumably did not emerge as an outcome where there was
18 research that we would -- we would look into.

19 Q Just to make clear, this Box 2 reflects the work
20 your committee performed in reviewing the literature that
21 had been published between the time of the IOM report and
22 the time of this report in 2009, right?

23 A Not quite.

24 Q Okay.

25 A We looked at the cumulative evidence combined with

1 what was known at the time of the 2003 report with the
2 research that had subsequently appeared, so it's the --
3 it's across -- it's everything that was available as of
4 2008.

5 Q Okay. So it included the evidence or the
6 literature that was available up until the time of the IOM
7 report, plus the literature that had become available since
8 that time?

9 A That's correct, yes.

10 Q And did it -- did this categorization also reflect
11 the review of the animal literature?

12 A Yes, it did.

13 Q But with respect to exposure levels at Camp
14 Lejeune, I think we talked about this before, that's not
15 necessarily integrated into this analysis or is it?

16 A It is not. I mean this was explicitly about what
17 is the evidence regarding these chemicals, not these
18 chemicals and the manner that exposure occurred at Camp
19 Lejeune or anything of that sort. It's a much more sort of
20 generic assessment of the evidence of human health effects
21 from exposure to these chemicals.

22 Q So was there any distinction between studies that
23 involved, for example, occupational exposure versus
24 community exposures and how you categorized these health
25 effects?

1 A That was not an influence on our categorization.

2 Q Okay. Were there instances where the
3 classification or the categorization changed from the IOM
4 report to this report?

5 A I would have to review that. The way the text
6 reads, we would have indicated -- we would have indicated
7 why, but I would have to go back to the epidemiology
8 chapter and look outcome by outcome to answer that.

9 Q Okay. I think we will go through some of those
10 later. Some diseases are followed by a parenthetical that
11 includes, you know, just TCE or solvent mixtures. Can you
12 tell me what the parenthetical is supposed to represent, if
13 there is one?

14 A Yeah, no, again, I'm just looking at the footnote
15 and trying to refresh my memory, but basically where there
16 is limited and suggestive evidence, sometimes it's for --
17 well, we indicated what -- what are the chemical exposures
18 for which that is true and we noted things like solvent
19 mixtures or PCE, in that category, and then under the
20 inadequate/insufficient, we would -- I believe -- I'm not
21 sure if we did this the way I'm describing it, but I
22 believe it was only for the ones that had also appeared in
23 the upper category, so if you look at esophageal cancer,
24 it's limited and suggestive for PCE, it's
25 inadequate/insufficient for TCE.

1 Q Okay.

2 A So I think it can be interpreted literally that
3 way. Where there is let's say -- I don't know at the
4 time -- you know, pick another one, nasal cancer, well,
5 there is nothing in parentheses after it, so it means it
6 was -- we considered it insufficient or inadequate for both
7 TCE and PCE.

8 Q Okay. And where there is a parenthetical that
9 says solvent mixtures, what does that indicate?

10 A That means that the literature was not addressing
11 TCE or PCE specifically, but there was evidence from a
12 broader array of solvent exposures that indicated -- you
13 know, provided limited/suggestive evidence of an
14 association.

15 Q Okay. Did the committee place any diseases in the
16 category of sufficient evidence of a causal relationship?

17 A No, we did not.

18 Q And was that because it did not meet the criteria
19 from that category as described in Box 1?

20 A Based on our assessment of the evidence, it did
21 not meet that -- that threshold.

22 Q And did the committee place any diseases in the
23 category of sufficient evidence of an association?

24 A No, we did not. Again, using the criteria that
25 had been adopted, we did not put any in that category.

1 Q And it appears that several diseases were placed
2 in either the category of limited/suggestive evidence of an
3 association or inadequate/insufficient evidence to
4 determine whether an association exists, correct?

5 A That's correct, yes.

6 Q Let me direct your attention to page seven of the
7 report. Can you read the first sentence of the first full
8 paragraph starting as shown in Box 2?

9 A As shown in Box 2, all the health outcomes
10 reviewed were placed into one of two categories. Continue?

11 Q Yeah, continue to the next sentence.

12 A The strongest evidence was in the category of
13 limited/suggestive of an association, which means that
14 there is some evidence that people who were exposed to TCE
15 or PCE were more likely to have the disease or disorder,
16 but that the studies were either few in number or had
17 important limitations.

18 Q Do you remember what the study limitations that
19 are referenced here were?

20 A Again, the criterion is -- the criteria for that
21 is there's been an association observed, but the literature
22 does not allow us to exclude chance or bias as a potential
23 explanation for that association, so it would vary across
24 studies, but if there was concern about a potential
25 confounder that had not been controlled or if there was

1 concern about the way they measured exposure that we felt,
2 you know, limited the inferences that could be drawn, then
3 we would say it was there, but limited and suggestive based
4 again on these alternative explanations.

5 Q Can you continue to read to the end of the
6 paragraph starting with in many cases?

7 A In many cases, the studies could not separate out
8 the effects of individual chemicals because the people were
9 exposed to mixtures. Some of these studies were of highly
10 exposed groups of workers where detection of effects would
11 be expected if present. Such studies might reach
12 conclusions about solvents in general, but not about TCE or
13 PCE specifically. For diseases and disorders where the
14 evidence is limited/suggestive of an association, the
15 committee has concluded that the epidemiologic studies give
16 some reason to be concerned that sufficiently high levels
17 of the chemical may cause the disease, but the studies do
18 not provide strong evidence that they actually do so.

19 Q Thank you. You read there that some of the
20 studies were of highly exposed groups of workers where
21 detection of effects would be expected if present, right?

22 A That's correct, yes.

23 Q Why is it significant to note that some of the
24 studies were of highly exposed groups?

25 MR. TELAN: Form.

1 A In judging the informativeness of the study, one
2 of the key features is the magnitude of exposure contrast,
3 and in many studies, they don't have a lot of individuals
4 who are at the upper end of the distribution, and having
5 those individuals enhances the study's capability of
6 detecting adverse effects if indeed there really are
7 adverse effects. A study that doesn't have much of a
8 contrast where it's, you know, between none and very little
9 is not as informative for the overall judgment as a study
10 that has a contrast between none and a lot simply.

11 Q So that is why the magnitude of exposure might be
12 significant to a study?

13 A Yes, that's why it would be an important
14 consideration.

15 Q And why was it significant to the committee if
16 studies were few in number or had important limitations,
17 why would that be significant?

18 A Well, again, the number of studies -- it's part of
19 the algorithm, but more broadly, a series of studies that
20 may not be all that compelling individually, if they all
21 point in the same direction, it adds more confidence that
22 they are onto something, meaning finding an association.
23 And certainly, as I said, the quality of the studies, the
24 methodologic quality is always an important consideration.

25 Q You testified earlier that you didn't consider the

1 exposures at Camp Lejeune in particular in doing this
2 analysis of how these diseases should be categorized, but
3 generally, is considering highly exposed groups of workers
4 in a study an appropriate study for comparison to those
5 exposed to the chemicals at Camp Lejeune?

6 MR. TELAN: Form.

7 A There's -- there's two issues. I mean one is the
8 overall assessment is this chemical -- do we think it's
9 capable of causing a given disease? When you go further,
10 which we were not asked to do and did not do, to say and
11 what does that say about the Camp Lejeune population,
12 that's sort of an extrap -- we are always extrapolating
13 evidence from one setting to another, one population to
14 another, and that was not something that was considered in
15 the basic categorization. It was only the general evidence
16 that this chemical -- whether or not we think there is
17 evidence that it's acting as a possible cause of this
18 disease.

19 Q Okay. If you look back on page seven, there's a
20 discussion under section Review of Epidemiological Evidence
21 from Community Studies. Do you see that?

22 A Let me see.

23 Q The section kind of two thirds of the way down
24 page seven, Review of Epidemiologic Evidence from Community
25 Studies.

1 A I'm not finding this. Which paragraph, I'm sorry?

2 Q The next section below your finger.

3 A Oh, this, okay, of course, the whole section, yes.

4 Q Can you read the first two sentences of that
5 section into the record?

6 A Yes. The committee decided to consider the subset
7 of epidemiologic studies that were conducted in communities
8 exposed to solvents in their water supplies in more detail.
9 Because these studies involved populations and exposure
10 situations that more closely resemble those at Camp
11 Lejeune, some relevant implications might be learned.

12 Q Was that review part of the process that you used
13 in categorizing the diseases into the different categories?

14 A Yes, I mean I think in the sense that to the
15 degree it contributed generic information about whether
16 these chemicals could cause disease, that would be a part
17 of the array of research we would use. The point we were
18 making there is that whatever the methodologic rigor may
19 be, there are features that may make it more readily
20 extrapolated to the Camp Lejeune population. Again, we
21 didn't do that extrapolation, but we recognize there's a
22 particular interest in -- again, in using this array of
23 data we are presenting to ultimately make inferences about
24 the Camp Lejeune population, there's value in looking
25 closely at other community water contamination episodes

1 like that.

2 Q Do you recall generally what exposure scenarios
3 are being referenced here?

4 A Again, the general one is solvents contaminating
5 the drinking water supply of a community, so that anybody
6 that is served by that supply would have -- would have that
7 exposure through -- through ingestion, through inhalation,
8 through whatever means, anything that comes from the water.

9 Q Are those studies looking at geographic variation
10 in disease?

11 A That's often one of the key elements is whether or
12 not people lived in the location where the water was
13 contaminated, the time periods and the locations. There --
14 again, I don't recall. There are other ways of maybe
15 refining that a bit beyond, you know, to try to take into
16 account how long they have lived there or -- I can't recall
17 if some of them may have even looked at their water usage,
18 how much water they consumed and so on.

19 Q Are those usually based on available mortality or
20 cancer incidence data?

21 A Again, I would have to look at the individual
22 studies. They sometimes are and there are other studies --
23 I don't recall -- again, I would have to look back at that
24 section of the report, but they range -- I mean they
25 include studies certainly where it is just a spacial

1 distribution of contaminated water and the spacial
2 distribution of disease. Other cases -- other studies may
3 do that more effectively assigning exposure and examine the
4 association.

5 Q I want to show you a passage from your book and
6 ask if it's relevant to this.

7 A Okay.

8 Q Page 54.

9 THE REPORTER: What page?

10 MR. BAIN: 54.

11 Q And I'm looking toward the end of the first full
12 paragraph where you say here studies of geographic
13 variation and disease are easy to conduct using available
14 mortality or cancer incidence data and it may be tempting
15 to interpret those as providing valuable information, but
16 they rarely are effective in addressing the exposure
17 interest so that positive or negative findings should be
18 viewed skeptically. Can you describe what you are trying
19 to get across there?

20 MR. TELAN: Form objection.

21 A Sure, I mean the -- I'm aware that it's
22 intuitively appealing to try to answer these questions by
23 asking simple ones like does living in the contaminated
24 area, are the cancer rates higher or lower there, and there
25 are a lot of these community studies that have been done

1 because they are very easy to do and it's a way of warning
2 that if you see an association, it may well not be due to
3 what you think it was due to, it may be the demographics of
4 the community or the socioeconomic factors, other factors
5 like that, and if you see an association that the area of
6 contamination has higher risk, it may not be due to that
7 contamination. Again, it's -- referring to mortality or
8 cancer incidence data, it's especially problematic when
9 it's diseases that take a long time to develop. So, for
10 example, it would be less of a problem for pregnancy
11 outcome, which, you know, within nine months, the outcome
12 is experienced, versus a cancer that may take 30 years to
13 develop because the population moves around, people move in
14 and out and so on.

15 Q Okay. Can you read the -- I'm referring back to
16 page seven of the report, Exhibit 2. And can you go ahead
17 and read the next two sentences after where we left off
18 starting with a few studies?

19 A A few studies reported certain diseases and
20 disorders, such as congenital heart defects, spontaneous
21 abortions and very low birth weight. However, the studies
22 reported differing effects so that generally they did not
23 confirm each other.

24 Q What was the significance to the committee that
25 the studies reported differing effects so that generally

1 they did not confirm each other?

2 MR. TELAN: Object to the form.

3 A Well, again, one study may have reported an
4 increased risk of congenital heart defects, a different
5 study may have reported an increase in very low birth
6 weight. Those are not corroborating one another. You have
7 to look at the specific outcomes and see whether multiple
8 studies are pointing in the same direction. It's a
9 consistency issue there.

10 Q Okay. Later in the paragraph, next to the last
11 full sentence, the committee notes that another common
12 limitation of community studies in general is that they are
13 not able to account for other factors that may affect the
14 likelihood of disease. Do you see that?

15 A Yes.

16 Q Can you explain what other factors is being
17 referenced there or are being referenced there?

18 A The data availability -- there are certain things
19 that are easily obtained that describe community
20 populations. We may have some information about their age
21 distribution or their ethnicity distribution or their
22 income levels. We aren't going to have data on what their
23 rate of tobacco use is or what their rate of obesity is or
24 other information that may well differ by communities that
25 independently is related to the health outcome you are

1 interested in.

2 Q The final sentence of that paragraph, which is on
3 page nine, first full sentence on page nine says the
4 committee concluded that the evidence provided by this
5 subset of epidemiologic studies needs further support and
6 confirmation before they can be considered significant on
7 their own. What type of further support and confirmation
8 is being referenced there?

9 A Again, I think in the obvious way, additional and
10 higher quality studies that -- by additional, it would give
11 you the opportunity to either, you know, corroborate or not
12 corroborate the suggestions that have arisen. And again,
13 it is making a judgment both about the volume of those
14 studies and the methodologic strength of the studies.

15 Q Okay. I would like to ask you to turn to page
16 165. And this discusses in more detail the Epidemiologic
17 Studies of Solvent-Contaminated Water Supplies; is that
18 right?

19 A That's correct, yes.

20 Q And does the chapter include a couple of tables
21 starting on page 166 to 171 and then 173 to 176 describing
22 some of those studies?

23 A Yes, yes.

24 Q Can you recall as you sit here today or by briefly
25 looking over these tables what some of those situations

1 were?

2 A Again, the most -- the most general form is a
3 geographic area where there was a discovery of solvent
4 contamination of the water supply, and motivated by that
5 discovery of elevated exposure, an effort was made to
6 assess whether the populations who had received that --
7 used that source of water had elevated risk of diseases.
8 There are variations on that theme of exactly which
9 chemicals -- obviously the geographic area varies, but they
10 are all sort of related to that general theme and approach.

11 Q And are the conclusions of that review included on
12 page 179?

13 A Yes.

14 Q Can you read the paragraph conclusions into the
15 record?

16 A Yes. Collectively, the epidemiologic studies of
17 solvent contamination of water supplies and adverse health
18 effects are of limited quality. If their distinctive
19 strengths and limitations are taken into account, such
20 studies contribute to the overall assessment of the
21 epidemiologic literature, but the committee has judged that
22 their strengths, comparability with Camp Lejeune in
23 exposure pathways and diversity of exposed population, do
24 not overcome their limitations, especially quality of
25 exposure assessment, lower range of exposure, and

1 imprecision in measures of association, to allow
2 identification of high priority outcomes on the basis of
3 their results alone.

4 Q Okay. I would like you to turn to Chapter 5 on
5 page 134. And does this chapter cover the committee's
6 review of the epidemiologic literature?

7 A Yes, it does.

8 Q And is it organized by disease?

9 A Yes, it is.

10 Q And would it be fair to say -- and you can take a
11 look at this -- that for each disease, the report discusses
12 first the IOM's conclusions from 2003 and then follows with
13 the committee's 2008 evaluation?

14 A That's correct, yes.

15 Q And finally, there's a bullet point for each
16 disease on the committee's ultimate conclusion on how the
17 disease should be categorized?

18 A That's correct, yes.

19 Q I want to take a look at some of these diseases in
20 a little bit of detail starting on page 147.

21 A Okay.

22 Q I want to direct your attention to the discussion
23 on bladder cancer. What were the IOM's conclusions in 2003
24 with respect to TCE and PCE and bladder cancer?

25 MR. TELAN: Object to the form.

1 A Again, I'm just reading from this, you know. This
2 is general just based on what we said at the time. They
3 concluded there was limited/suggestive evidence of an
4 association between exposure to PCE and dry-cleaning
5 solvents and bladder cancer. I'm looking for the TCE
6 comments, but I don't -- oh, there it is.

7 Q Is it in the first sentence with respect to TCE?

8 A They reviewed the studies. It doesn't say what
9 the IOM 2003 report -- at least I'm not finding it -- oh,
10 okay, okay, I'm sorry, TCE was designated as
11 insufficient/inadequate at the time in 2003, that's
12 correct, and then PCE was judged to be limited/suggestive.

13 Q And did the committee find additional studies to
14 review since the IOM 2003 conclusion?

15 MR. TELAN: Form.

16 A Yes, we did.

17 Q And those studies are listed under the 2008
18 evaluation; is that correct?

19 A That's correct.

20 Q And it's noted here that the results were
21 inconsistent. Do you see that?

22 A I see that, yes.

23 Q Do you know whether any of these studies
24 involved -- strike that.

25 Are you aware of which of these studies involved

1 occupational exposures?

2 A I would have to look back at the individual
3 reports. I don't know that off the top of my head.

4 Q Okay. Well, the first line indicates that at
5 least for the studies identified in the first sentence,
6 those were cohort studies of occupational groups
7 potentially exposed to TCE, correct?

8 A Right, I'm not sure which occupations, but we do
9 mention later on the dry-cleaning workers. There may be
10 others.

11 Q Okay. And you see at the end of that section,
12 there was at least one study of a community exposed TCE and
13 PCE in the public drinking water supply, the Morgan and
14 Cassady study?

15 A Yes, I do.

16 Q In that particular study, there was no evidence of
17 an increased risk of bladder cancer after exposure. Do you
18 see that?

19 A Yes, I do.

20 Q In the 2003 Blair study that's mentioned there, it
21 was a study of dry-cleaning workers; is that right?

22 A Yes.

23 Q And the committee noted that in the Blair study,
24 the SMR for bladder cancer was increased at 1.3. Do you
25 see that?

1 A Yes, I do.

2 Q Can you describe what that means?

3 A It means that, again, the point estimate or best
4 estimate is there's a 30 percent increase in risk with a
5 range of uncertainty around it that's fairly -- fairly
6 wide, the confidence interval, so it's -- provides some
7 support for a positive association.

8 Q And what is an SMR and how does that compare to
9 some of the other measures that are used such as RR and OR?

10 A I mean they are all very closely related. They
11 are all a relative risk. That's probably the most generic.
12 SMR or standardized mortality ratio or morbidity ratio is
13 usually used when you are comparing the individuals in your
14 study to the general population, so you might consider the
15 rates of bladder cancer in dry-cleaning workers to the
16 rates of bladder cancer -- what would be expected if they
17 had the same rates as the average pop -- as the U.S.
18 general population as opposed to comparing highly exposed
19 dry-cleaning workers to low exposure dry-cleaning workers
20 as comparing dry-cleaning workers to the United States as a
21 whole.

22 Q So the SMR is comparing to the general population?

23 A Correct.

24 Q A RR and OR might be comparing two groups that
25 aren't from the general population?

1 A That's correct.

2 Q Okay. And you noted that the confidence interval
3 for the Blair study is .7 to 2.4?

4 A That's correct.

5 Q And what does that represent?

6 A Well, it's a way of characterizing sort of the
7 spread or statistical uncertainty in the estimate. And
8 again, it can be hard to sort of explain clearly, but
9 the -- when you measure 1.3 as the best estimate, it gives
10 you a sense, well, could it really be 1 or 1.6, how far
11 would it extend, and one way to think of it, if it helps,
12 is you can think of sort of a bell curve over this 1.3,
13 values close to it, those are fairly plausible, and as you
14 go further and further away, left and right, they become
15 increasingly unlikely to -- to be indicative of the
16 association, so this is suggesting there's a moderate
17 degree of uncertainty. It's not -- it can be so extreme
18 that it's an uninformative study. I would not say that's
19 the case, it's an informative study, but it does suffer
20 from some degree of imprecision.

21 Q And I noticed at the lower end of the confidence
22 interval is less than 1 and --

23 A Right.

24 Q -- I recall from your book some critique of using
25 that as a benchmark. Can you describe that?

1 A Right, .7 is no more likely than 2.4, so you can
2 say -- again, sometimes they use -- I think it's a misuse
3 of the statistical significance testing to say -- to sort
4 of emphasize that it could be as low or lower than 1.0. In
5 other words, maybe there is no increase, but that's -- I
6 could also say maybe there's an increase that is over 2-1/2
7 fold bigger and it's trying to use it to -- to interpret
8 the spread rather than trying to test it and make a
9 declaration. So it's trying to give a sense of what does
10 it mean with regard to the degree of uncertainty just due
11 to small study size, it's due to small numbers, so I tried
12 in the book -- and I don't know whether I succeeded or
13 not -- to explain that it provides the -- the confidence
14 interval provides important information, but not just to
15 declare it statistically significant or not.

16 Q Okay. That's helpful. I noticed that neither in
17 this report nor in your book, at least as far as I can
18 recall, that I ever saw the term confidence interval ratio
19 used. Have you ever heard that term used before?

20 A Yeah, confidence limit ratio and it's just simply
21 the upper over the lower bound of it as a way of
22 describing -- it can be a useful concept -- how spread out
23 is it because if there's a study where it's let's say a
24 tenfold ratio where -- let's say in this study, the upper
25 limit was, you know, 8 and the lower limit was .8.

1 Q Uh-huh.

2 A You might say, gee, that is really -- we don't
3 know much and that would be correct, it is just too
4 imprecise. This is giving a ratio of, what, about 3-1/2 or
5 so, let's say. It's a reasonable size study. It could be
6 bigger, but it's a way to try to add information to help
7 judge the statistical stability of the estimate.

8 Q Do epidemiologists use a confidence interval ratio
9 as a way of distinguishing studies with more value from
10 studies with less value?

11 MR. TELAN: Form.

12 Q Such as a confidence interval ratio of 3.

13 MR. TELAN: Object to the form.

14 A It's intended to -- I think that's what you are
15 saying, but let me put it in my own words. I think it's
16 how informative it is in terms of random error, in other
17 words, it's only one consideration. There could still be
18 the presence or absence of confounding or dose-response
19 gradients or all these other factors we talk about, but
20 zeroing in on the issue of precision, it's a way to convey
21 a sense of how informative it is in a statistical sense.

22 Q Okay. So it's focused on the possibility of
23 random error; is that right?

24 A That's correct, only that.

25 Q Do you know whether the committee used any type of

1 confidence interval ratio in evaluating studies for this
2 report?

3 A I don't recall.

4 Q Can you recall generally how the committee used
5 the confidence intervals generally in reviewing the studies
6 that it reviewed?

7 A You know, I don't -- I don't recall that coming up
8 specifically for discussion. I mean there are varying
9 interpretations of this among epidemiologists, you know,
10 varied over the course of my career on how to interpret it,
11 but I don't recall it being a specific point of contention
12 in interpreting the -- the evidence.

13 Q Okay. I'm trying to find something in your book
14 that -- okay. So if you turn to page 46 of your book. Do
15 you see about halfway down page 46 where you start one of
16 the ways to think?

17 A Yes.

18 Q It states that one of the ways to think about how
19 precise or stable the estimate would be, to ask how many
20 people would have to change from disease to nondisease or
21 vice-versa to result in any meaningful difference in the
22 measurement of association. If it's small, less than 5,
23 say, that makes random error a real concern, whereas if
24 it's large, say 20 or more, random error is not so much of
25 a concern. Do you see that?

1 A Yes, I do.

2 Q And is that getting at the same type of analysis
3 you do with the confidence interval?

4 MR. TELAN: Object to the form.

5 A Again, just to be clear, we are in sort of the
6 realm of how I interpret epidemiology. I can't speak for
7 the committee at this point, but it's another way of trying
8 to make a very abstract concept a little more intuitive and
9 that's the big challenge here. If you look at the other
10 parts of this chapter, it's -- it's really a very sort of
11 esoteric technical foundation and it's trying to sort of
12 give -- give a feeling for it and that is reflective of
13 another way I find confidence intervals very informative,
14 but I've been working with them for many, many years. This
15 may be a way that if you see that a handful of people could
16 change things dramatically, you may want to be cautious in
17 giving too much credence to that finding.

18 Q Okay. That's helpful.

19 Okay. Going back to page 147, on bladder cancer,
20 I would like you to read what conclusion the committee
21 finally came up with on bladder cancer, which I believe is
22 in the last bullet point, if you could read that for the
23 record.

24 A Yes. The committee concludes that there continues
25 to be inadequate/insufficient evidence to determine whether

1 an association exists between chronic exposure to TCE and
2 bladder cancer. The evidence on PCE and mixtures of
3 organic solvents continues to support a conclusion that
4 there is limited/suggestive evidence of an association
5 between chronic exposure to PCE or mixtures of organic
6 solvents and bladder cancer.

7 Q Okay. Thank you. I want to move to kidney cancer
8 which I think is starting at the bottom of that page. What
9 was the IOM's conclusion in 2003 with respect to TCE and
10 PCE and kidney cancer?

11 MR. TELAN: Object to the form.

12 A With regard -- I had to find that in the
13 paragraph. This is regarding TCE, the IOM committee judged
14 the studies insufficient for drawing conclusions. For PCE,
15 their conclusion was there is limited/suggestive evidence
16 of an association for kidney cancer.

17 Q Did the study review some additional -- excuse
18 me -- strike that.

19 Did the committee review some additional studies
20 with respect to kidney cancer and TCE and PCE?

21 A Yes, we did.

22 Q And some of the same studies that were considered
23 in bladder cancer; is that right?

24 A That's correct, yes.

25 Q And one of the studies there is the

1 Raaschou-Nielsen study. Do you see that? I don't know if
2 I'm pronouncing it correctly.

3 A Yes, I do.

4 Q And what were the findings of that study?

5 A Again, I'm looking at the 2008 evaluation now
6 where we are looking at TCE. They reported an SIR which is
7 a standardized incidence ratio of 1.6 in men employed for
8 five years or more.

9 Q And you are aware that was an occupation study?

10 A Yes.

11 Q Do you know what the employment of the individuals
12 in that study were?

13 A I don't recall, no.

14 Q And what does an SIR of 1.6 mean?

15 A Again, it's another measure of relative risk. In
16 this case, they are dealing with incidents rather than
17 mortality, new occurrence of the disease, and it is --
18 again, that's the estimated magnitude of the increased
19 risk, a 60 percent increase. In this case, it's a rather
20 narrow confidence interval obviously from a larger study
21 for those with longer-term employment. So it is both --
22 you could say in terms of the interpretation issue, it's
23 the magnitude, but it's also when the elevated risk is
24 in -- is identified in longer-term workers, it's a form of
25 a does-response evaluation, longer -- over five years

1 equating to some degree to more highly exposed.

2 Q Okay. And how did that study factor into the
3 committee's conclusion on the relationship between TCE and
4 kidney cancer?

5 A Well, as indicated there, again, it's the
6 cumulative evidence, it's all reviewed in that --
7 summarized in that paragraph of the -- under 2008
8 evaluation and the committee viewed it that this had
9 shifted the evidence into the -- at least the limited and
10 suggestive range for TCE.

11 Q And what conclusion did the committee make with
12 respect to TCE, PCE and kidney cancer, if you can read the
13 first bullet into the record first?

14 A Yes. On the basis of the available data, the
15 committee concludes that there is limited/suggestive
16 evidence of an association between chronic exposure to TCE
17 or PCE and kidney cancer. In the case of TCE, that
18 conclusion constitutes a change in the one drawn by IOM in
19 2003.

20 Q So that shows at least in that circumstance, there
21 was a change in the classification that was made by your
22 committee?

23 A Yes, I believe we tried to note that and explain
24 more carefully when we thought the evidence -- we were
25 interpreting the evidence as of 2008 differently than they

1 interpreted it as of 2003.

2 Q And can you read the next bullet point into the
3 record?

4 A Yes. Because consensus was not reached on a
5 characterization of the data on mixtures of organic
6 solvents and kidney cancer, the committee performed its own
7 evaluation of the data in the IOM report. The committee
8 concluded that reports of positive associations in multiple
9 studies, even in the context of study limitations and
10 negative studies, were sufficient to state that the
11 evidence of an association between mixtures of organic
12 solvents and kidney cancer is limited/suggestive.

13 Q Okay. So when you refer there that a consensus
14 was not reached on the characterization of the data on
15 mixtures of organic solvents and kidney cancer, are you
16 referring to the work of the committee looking at the
17 evidence since 2003?

18 A No, that's referring to the other committee, in
19 other words, the IOM 2003 could not reach a consensus.

20 Q I see.

21 A So we went back and examined the entire array of
22 data both prior to 2003 and after 2003 and that reflects
23 our judgment.

24 Q Thanks for that clarification.

25 If you can turn to page 149. And I promise you

1 I'm not going to go through every disease. We are only
2 going to go through the five that are at issue right now.
3 And this is nonHodgkins lymphoma. What were the IOM's
4 conclusions in 2003 with respect to TCE and PCE and
5 nonHodgkins lymphoma?

6 MR. TELAN: Object to the form.

7 A In the IOM 2003, they concluded there was
8 inadequate/insufficient evidence for TCE, PCE or solvent
9 mixtures in relation to nonHodgkins lymphoma.

10 Q Did your committee review additional studies with
11 respect to TCE and PCE and nonHodgkins lymphoma that had
12 become available since 2003?

13 A Yes, we did.

14 Q And again, you cite the Raaschou-Nielsen study,
15 correct?

16 A That's correct, yes.

17 Q What did you note about the dose-response
18 relationships in that study?

19 A We noted that there appeared to be a dose-response
20 relationship based on duration of employment.

21 Q And as I think we discussed earlier, the amount of
22 confidence you might have in an association being present
23 is supported when there's a step-wise increase -- an
24 exposure that's associated with a step-wise increase in
25 risk of disease, right?

1 MR. TELAN: Object to the form.

2 A That is correct, yes.

3 Q Does a nonmonotonic dose-response trend support
4 causality for these chemicals?

5 MR. TELAN: Object to the form.

6 A You know, nonmonotonic just means it's not
7 step-wise. It really depends on the pattern though. I
8 think if it -- let's say there are three groups and it's
9 low in the low and medium group and high in the high group,
10 the relative risk, that's not step-wise, but it is higher
11 in the high group. So if it's high in the middle and high
12 groups, the relative risk, when it's really erratic, when
13 it's let's say high only in the middle group, then you
14 start to question whether that's sort of an artifact. You
15 would never expect that to be a causal. Unevenness in the
16 magnitude and so on, I would not take that -- I would not
17 interpret that too rigidly, so it's a matter of how
18 nonmonotonic is it.

19 Q Okay. So when the highest is the middle level,
20 that gives you more concern?

21 A Yes.

22 Q Rather than other nonmonotonic which appears to be
23 increasing?

24 MR. TELAN: Object to the form.

25 A Right, or highest in the low level, that doesn't

1 really fit well. There can be what we call sometimes a
2 ceiling effect where once you get to medium, it's no worse
3 if you are high.

4 Q Uh-huh.

5 A Or there can be sort of, if you will, a threshold
6 effect where low and medium are not substantial enough to
7 increase risk, but high exposure is. Those are more
8 plausible scenarios. It's hard -- it's hard to come up
9 with scenarios where a little bit is bad and a lot is not.

10 Q And there's been some debate regarding
11 nonmonotonic dose-response transfer endocrine disrupters.
12 Are you aware of that?

13 A Yes, I am.

14 Q And you were in fact on an NAS committee that
15 looked into that?

16 A Yes, I was.

17 Q PCE and TCE, they are not considered to be
18 endocrine disrupters, are they?

19 MR. TELAN: Object to form.

20 A I honestly don't know. I would have to look that
21 up.

22 Q What conclusion did the committee draw with
23 respect to nonHodgkins lymphoma in the last bullet point on
24 page -- in the bullet point on page 150 there?

25 A There continues to be inadequate/insufficient

1 evidence to determine whether an association exists between
2 chronic exposure to TCE or PCE and nonHodgkins lymphoma.

3 Q Let's move to adult leukemia on page 151. What
4 were the IOM's conclusions in 2003 with respect to TCE and
5 PCE and adult leukemia?

6 MR. TELAN: Object to the form.

7 A They concluded there was inadequate/insufficient
8 evidence for TCE or PCE and adult leukemia and
9 limited/suggestive evidence for solvent mixtures and adult
10 leukemia.

11 Q And I just want to note for the record that you
12 said inadequate/insufficient evidence, right?

13 A Yes, I'm sorry, I may have misstated that.

14 Q No, I'm not sure if you did or not, but I just
15 want to make clear for the court reporter that that's the
16 category.

17 And did the committee look at some additional
18 studies that had been done since 2003 with respect to adult
19 leukemia?

20 A Yes, we did.

21 Q And I see again the Morgan Cassady study is noted
22 here; is that right?

23 A That's correct, yes.

24 Q That again is a community study regarding solvent
25 exposure?

1 A I have to -- okay, I'm just looking at the text
2 there. Yes, that's correct.

3 Q What were the findings of the Morgan and Cassady
4 study with respect to the relationship between exposure and
5 adult leukemia?

6 A Basically that there was no association found.
7 The standard incidence ratio was 1.02, very close to null.

8 Q And the null is reflected by 1?

9 A 1.0, yes.

10 Q And what's the confidence interval in that study?

11 A .74 to 1.35.

12 Q So I notice for that particular study, a
13 99 percent confidence interval is used instead of a
14 95 percent confidence interval. Do you see that?

15 A Yes.

16 Q And are you aware of circumstances in
17 epidemiological studies where a 99 percent confidence
18 interval would be more appropriate than using the
19 95 percent confidence interval?

20 MR. TELAN: Object to the form.

21 A Again, my own view is that -- that it's better to
22 stay with the standard because it's familiar and I know
23 better how to interpret it. It's arbitrary, 95 is -- there
24 is nothing magic about that, it's very traditional, so I
25 personally find it more informative to stick with that.

1 Other people will argue that they are trying to make it
2 more conservative or they are trying to sort of -- they
3 believe they are in a situation that calls for something
4 different, and that's their decision, but I tend to find it
5 more helpful to -- just because I have sort of a mental fix
6 on what a 95 percent confidence interval looks like.

7 Q Are you aware of factors where epidemiologists
8 might use a 99 percent confidence interval as opposed to a
9 95 percent confidence interval?

10 MR. TELAN: Form objection.

11 A Again, I think it is used to be more conservative.

12 Q Okay.

13 A My interpretation is -- you know, again, it's
14 taking many things into account and I don't find --
15 personally find it terribly helpful to incorporate that
16 into the confidence interval, but that's the reasoning
17 behind it is to sort of be I think more cautious, if
18 anything.

19 Q What about there being more different outcomes
20 evaluated in the same study?

21 A It's a way that they may want to account for the
22 multiple comparisons issue as it is sometimes described,
23 but again, I would take that into account in looking at the
24 overall array of results. The point is not wrong, but I
25 don't find the particular solution one that is terribly

1 helpful.

2 Q Okay. What conclusion did the committee reach
3 with respect to TCE and PCE and adult leukemia?

4 A I will read from that conclusion. There continues
5 to be inadequate/insufficient evidence to determine whether
6 an association exists between chronic exposure to TCE or
7 PCE and adult leukemia. IOM's conclusion that there is
8 limited/suggestive evidence of an association between
9 chronic exposure to unspecified mixtures of organic
10 solvents and adult leukemia also remains unchanged.

11 Q Okay. And the last one I want to ask you about is
12 Parkinson's Disease on page 160. What were the IOM's
13 conclusions in 2003 with respect to TCE and PCE and
14 Parkinson's Disease?

15 MR. TELAN: Object to the form.

16 A There's no comment reflected there regarding TCE
17 and PCE specifically, but the IOM 2003 report concluded
18 there was inadequate/insufficient evidence to determine
19 whether an association was there between exposure to the
20 solvents that were reviewed and Parkinson's Disease.

21 Q And did the committee consider additional studies
22 that had been done since 2003 as part of this 2008
23 evaluation?

24 A Yes, it did.

25 Q And what conclusion did the committee make with

1 respect to TCE, PCE and Parkinson's Disease?

2 A The committee concluded there continues to be
3 inadequate/insufficient evidence to determine whether an
4 association exists between solvent exposure and Parkinson's
5 Disease.

6 Q Okay. Go back to page seven of the report. And
7 do you see the paragraph in the middle of the page which
8 starts the majority of the health outcomes reviewed?

9 A Yes.

10 Q Can you read that paragraph into the record?

11 A The majority of the health outcomes reviewed by
12 the committee were placed into the category of
13 inadequate/insufficient evidence to determine whether an
14 association exists, which means that the studies were too
15 few in number, limited in quality, inconsistent or
16 inconclusive in results to make an informed assessment. It
17 also means that such an association cannot be ruled out.
18 For diseases and disorders in this category, the committee
19 has concluded that the epidemiologic studies cannot tell us
20 whether exposure to the chemicals is associated with the
21 disease or not.

22 Q Okay. And then in Box 2, what category or
23 categories was bladder cancer put into?

24 A Bladder cancer was put into the limited/suggestive
25 category for PCE. It was put in the

1 inadequate/insufficient evidence category for TCE.

2 Q And again, that reflects the differences with
3 respect to the studies that looked at PCE versus those that
4 looked at TCE?

5 A Well, or the results of those studies. In some
6 cases, the same study might or might not look at both, but
7 we compiled the evidence on a chemical specific basis to
8 reach those conclusions.

9 Q In Box 2, what category was kidney cancer put
10 into?

11 A Kidney cancer was put into the limited/suggestive
12 category. And because there is no -- no chemical
13 specified, in that case, it was for both TCE and PCE.

14 Q Okay. In Box 2, where was adult leukemia
15 categorized?

16 A Adult leukemia was in the limited/suggestive
17 category for solvent mixtures and for the -- it was
18 inadequate/insufficient for both TCE and PCE specifically.

19 Q Okay. Can you clarify, you know, with respect to
20 solvent mixtures, is that where the study just reflects
21 there being a solvent mixture without reflecting what's in
22 the solvent or --

23 A Again, I would have to look back at the individual
24 studies. It was either -- it was addressing obviously a
25 mixture. There may have been varying capabilities to sort

1 of -- to characterize what was in the mixture, that's a
2 study by study issue, but it was not providing information
3 specific to TCE or PCE.

4 Q Do you know whether the committee considered
5 distinguishing between different types of adult leukemia
6 for these categorizations?

7 A I don't know. I mean I think that -- I could
8 speculate, but I do not recall how that decision was made.

9 Q In your experience as an epidemiologist, have you
10 seen where toxic exposures are only associated with certain
11 types of leukemia?

12 MR. TELAN: Form objection.

13 A There certainly are indications of specific
14 exposures being related to subsets, I mean sometimes one,
15 sometimes multiple types, but yes, there are instances
16 where the evidence is stronger for one subtype than
17 another. It's very often though as a practical matter
18 limited by small numbers. Leukemia is a relatively rare
19 disease, and when you break it down into subsets, you often
20 find there is not a lot of literature to guide you.

21 Q Okay. Going back to Box 2, where was nonHodgkins
22 lymphoma categorized?

23 A Non-Hodgkins lymphoma was inadequate/insufficient
24 in this case without indications, so it's both for TCE and
25 PCE.

1 Q Okay. Where was Parkinson's Disease categorized?

2 A Parkinson's Disease was in the
3 adequate/insufficient, again, not specified by chemical, so
4 as of our assessment in 2008, that was the -- that was the
5 judgment.

6 Q Okay. I'm about to go to a different subject
7 matter. Do you want to take a break?

8 A Sure, brief.

9 MR. BAIN: We will take a brief break here.

10 THE VIDEOGRAPHER: Off the record. 2:25.

11 (A short break was taken.)

12 THE VIDEOGRAPHER: Back on the record. 2:32.

13 Media number four. Please proceed.

14 Q Dr. Savitz, if you can turn to page nine of your
15 report. Do you see a section that's entitled Review of the
16 Toxicologic Evidence?

17 A Yes, I do.

18 Q And what was the significance of the committee's
19 review of the toxicologic evidence?

20 MR. TELAN: Object to the form.

21 A We -- again, as actually was indicated in the
22 charge, we included studies of the chemicals of concern
23 that had been addressing animal studies, other mechanistic
24 research.

25 Q Can you look down to the last paragraph of that

1 section that starts with when possible and read the first
2 two sentences of that paragraph?

3 A Yes. When possible, the committee identified the
4 lowest dose of TCE or PCE at which adverse effects were
5 observed in animal studies. The dose is called the lowest
6 observed adverse effect level or LOAEL. To put these doses
7 in perspective, the committee did a comparison of the doses
8 with approximated doses to former residents that were
9 estimated from concentrations of TCE and PCE measured in
10 mixed water.

11 Q Can you describe how those lowest observed effect
12 levels are determined in animals?

13 MR. TELAN: Form objection.

14 A Again, I'm not an expert in -- in toxicology, so I
15 really can't speak to the generation or really
16 independently the interpretation of those.

17 Q Do you know generally what those are?

18 MR. TELAN: Object to the form.

19 A Again, I have a broad sense of just taking the
20 phrases literally, lowest observed adverse effect level,
21 but that's as far as -- again, it's without real expertise
22 in the science.

23 Q Do you know that it's based on studies that are
24 done of animals?

25 A I know that it's based on experiments I assume

1 with animals or perhaps with -- with some cellular level or
2 other experimental systems.

3 Q Do you know what end points were considered with
4 respect to the adverse effect?

5 A I do not. I mean we did -- again, in developing
6 the integration of the toxicology and the epidemiology, we
7 did discuss where they -- where they converged or where
8 they did not converge, so I'm aware that they had -- that
9 the toxicology was considering end points, some of which
10 were parallel to what the human studies addressed.

11 Q So with respect to the animal studies, do you know
12 whether they looked at acute, chronic or subchronic
13 exposures?

14 A Again, I did not -- again, except what would be
15 indicated somewhere in the report, I don't recall that
16 right now.

17 Q As an epidemiologist, would you be able to say
18 whether the exposures at Camp Lejeune would be classified
19 as acute, chronic or subchronic?

20 MR. TELAN: Object to the form.

21 A Those terms are used variably. Again, I tend to
22 think it's better to give the time duration of, you know,
23 two years, five years, six months, whatever that is
24 because, again, there are very different interpretations of
25 what the words themselves might mean.

1 Q Were you aware at the time that there were
2 uncertainties related to the lowest adverse effect levels?

3 MR. TELAN: Form objection.

4 A Again, not -- no direct insight other than what
5 may have been communicated from the toxicologist back to
6 the committee.

7 Q So with respect to the toxicological part of this
8 report, looking at animal studies, were you involved at all
9 in reviewing it or approving it in any way?

10 A Again, the -- we all approved everything at the
11 end, but obviously there's a real -- not just a tendency,
12 but a presumption that we can rely on our colleagues who
13 are experts in the relevant areas, in other words, the
14 toxicologist would not have to sort of trust the
15 epidemiologist to do their job well and vice-versa.

16 Q I might be recalling this incorrectly, but I think
17 I recall in your book that an epidemiologist has to be more
18 of a generalist and know a little bit about toxicology, a
19 little bit about statistics, a little bit about other
20 things; is that correct?

21 MR. TELAN: Object to the form.

22 A I would say that epidemiology and epidemiologic
23 research is informed by toxicology at times, may get
24 guidance on what health end points may be of concern or
25 what might be -- whether there may be different

1 susceptibility, but I also think -- I think it's in the
2 book and I certainly have said it in other places that when
3 it comes to evaluating the quality and meaning of the
4 toxicology, epidemiologists sometimes will try to do that
5 and I have real misgivings because just as epidemiology is
6 too subtle a nuance for a toxicologist to be able to really
7 get it, the same thing is true in the other direction, is
8 it a relevant animal model, how applicable is it to the
9 human situation, those are -- those are not straightforward
10 questions. A toxicologist can address them, I can't.

11 Q Okay. So in this particular part of the report,
12 there's emphasis on the animal studies and it uses a lowest
13 adverse effect level. What about a critique that you
14 shouldn't have looked at lowest adverse effect levels, but
15 should have looked at no observable adverse effect level?

16 MR. TELAN: Object to the form.

17 A Again, I really can't weigh on that -- weigh in on
18 that with any depth of understanding.

19 Q Okay. If you go back to page nine. You are
20 talking about the review of the toxicological studies there
21 and identifying the lowest dose of TCE and PCE at which
22 adverse effect levels were observed and doing a comparison
23 of those doses to those that might have been experienced by
24 residents in Camp Lejeune. If you can look down in that
25 paragraph toward the end where it says the comparison

1 reflects, do you see that?

2 A Yes, I do.

3 Q Can you read that sentence into the record?

4 A The comparison reflects estimated combined daily
5 doses from all three routes of exposure, ingestion,
6 inhalation and skin contact, that could have occurred for
7 adults and children at Camp Lejeune.

8 Q Can you go ahead with the next sentence?

9 A Results of the comparison suggest that the highest
10 levels of either TCE or PCE measured in the mixed water
11 samples at Camp Lejeune were much lower than the lowest
12 dose that caused adverse effects in the most sensitive
13 strains and species of laboratory animals.

14 Q Okay. And do you know the details of how those
15 concentrations at Camp Lejeune were determined?

16 MR. TELAN: Object to the form.

17 A Again, not -- I don't know that. That's again a
18 function of the groundwater modeling and assumptions about
19 consumption and a few other factors that went into that.

20 Q Okay. Can you turn to page 130 of the report?

21 And if you go back to page 127 just to set the
22 context of that, do you see there was a hazard evaluation
23 of trichlorethylene and perchloroethylene exposure for
24 selected end points?

25 A Yes.

1 Q And are you aware generally of what that was?

2 MR. TELAN: Form objection.

3 A Again, I would have to read it and sort of read
4 the title. It's not a depth of understanding. I
5 understand the spirit of it or the intent of it, not the
6 execution interpretation of it.

7 Q And what do you understand is the spirit or intent
8 of it?

9 A Well, it's to try to sort of relate in a rough way
10 the levels of exposure found to be harmful in laboratory
11 experiments to the levels that people may have experienced.

12 Q Okay. And if you turn to page 130, do you see
13 where there's a discussion of the lowest observable adverse
14 effect level for TCE with respect to kidney cancer, renal
15 cancer and immunosuppression?

16 A Yes.

17 Q Can you read the bullet point regarding kidney
18 cancer into the record?

19 A Kidney cancer. The LOAEL of TCE for lifetime oral
20 exposure leading to kidney cancer in the rat is
21 1,000 milligrams per kilograms per day, NTP 1990s. The
22 estimated human adult dose at Camp Lejeune is 25,000 times
23 lower than the LOAEL for exposure at half the highest water
24 supply concentration, 12,500 times lower than the LOAEL for
25 exposure at the highest concentration, and 5,000 times

1 lower than the LOAEL for exposure at twice the highest
2 concentration for a lifetime exposure. For a child, the
3 comparable estimates are 10,000, 3,350 and 1,700 times
4 lower than the LOAEL respectively.

5 Q So is it your understanding that what is being
6 done here is looking at animal studies with respect to a
7 certain end point here, kidney cancer, finding a lowest
8 observable effect level for that particular end point, and
9 then comparing the concentration that led to that end point
10 to concentrations at Camp Lejeune based on looking at the
11 highest detected level of TCE and then half that level and
12 twice that level?

13 MR. TELAN: Object to the form of the question.

14 A Again, only in the broadest sense, as I said,
15 benchmarking what was observed in the animal experiments
16 with the experience at the Camp Lejeune population.

17 Q Okay. If you look down to the next bullet point
18 on renal toxicity, can you read that one into the record?

19 A Renal toxicity. The -- I will start calling it
20 LOAEL -- LOAEL of TCE for renal toxicity in the rat dosed
21 orally for 13 weeks is 250 milligrams per kilogram per day,
22 Mally, et al. 2006. The estimated human adult dose at Camp
23 Lejeune was 6,250 times lower than the LOAEL for exposure
24 at half the highest water supply concentration, 3,125 times
25 lower than the LOAEL for exposure at the highest

1 concentration, and 1,250 times lower than the LOAEL for
2 exposure at twice the highest concentration. For a child,
3 the comparable estimates are 2,500, 830 and 415 times lower
4 than the LOAEL respectively.

5 Q Do you have an understanding of why the numbers
6 are different for a child?

7 MR. TELAN: Form objection.

8 A Again, I can only presume that the assumption is
9 different, you know, the -- again, it's some physiologic
10 reason, but I don't honestly know what that's based on or
11 what the important differences are between children and
12 adults.

13 Q Okay. If you turn to page 131. Do you see
14 there's a comparison of the LOAEL, L-O-A-E-L, for each of
15 the two health end points selected from PCE animal studies
16 with the estimated doses from the water supply?

17 A Yes, I do.

18 Q And the two end points discussed there are renal
19 toxicity and neurotoxicity?

20 A Yes, that's correct.

21 Q Can you read the bullet point on renal toxicity
22 into the record?

23 A Renal toxicity. The LOAEL for renal toxicity in
24 the rat dosed orally with PCE for 32 days is 600 milligrams
25 per kilogram per day, Jonker, et al., 1996. The estimated

1 human adult dose at Camp Lejeune is 100,000 times lower
2 than the LOAEL for exposure at half the highest water
3 supply concentration, 60,000 times lower than the LOAEL for
4 exposure at the highest concentration -- oh, no -- highest
5 concentration and 30,000 times lower than the LOAEL for
6 exposure at twice the highest concentration. For a child,
7 the estimates are 30,000, 15,000 and 7,500 times lower than
8 the LOAEL respectively.

9 Q And then finally for neurotoxicity, can you read
10 that paragraph?

11 A Neurotoxicity. The LOAEL of PCE for neurotoxic
12 effects in rats is 50 milligrams per kilogram per day for
13 eight weeks, Chen, et al., 2002. The estimated human adult
14 dose at Camp Lejeune is 8,300 times lower than the LOAEL
15 for exposure at half the highest water supply
16 concentration, 5,000 times lower than the LOAEL for
17 exposure in the highest concentration, and 2500 times lower
18 than the LOAEL for exposure at twice the highest
19 concentration. For a child, the comparable estimates are
20 2,500, 1,250 and 625 times lower than the LOAEL
21 respectively. As noted in this chapter, there is a need
22 for additional research to clarify the neurotoxic effects
23 of PCE.

24 Q Okay. Thank you. We mentioned previously that
25 the committee made reference to the maximum contaminant

1 levels or MCLs for TCE and PCE in this report, right?

2 A Again, I'm not sure where you are referring to.

3 Q Okay. Are you aware that the MCLs for TCE -- TCE
4 and PCE --

5 A Yes, I'm sorry, that was where we were
6 characterizing the -- in broad terms whether these
7 exposures were in a range of concern, and found that
8 compared to the MCLs, that, indeed, they were.

9 Q And the ATSDR in their reports referenced the MCLs
10 for TCE and PCE, right?

11 A Again, I believe that makes sense, but I would
12 have to refer back to the sections where we cite that.

13 Q Okay. So I'm going to go through a little bit of
14 that. If you look at page 20 of the report.

15 A Okay.

16 Q Do you see there's a section entitled Exposure
17 Estimates in the Context of the Toxicologic and
18 Epidemiologic Evidence?

19 A Yes.

20 Q I've been asking you to read a lot, so I'm going
21 to read this one for you. Perspective is needed in
22 evaluating the exposures that occurred at Camp Lejeune.
23 For example, some exposures are described as being high and
24 others as being low. To understand the meaning of those
25 descriptors, it is important to understand what is being

1 compared. For example, ATSDR compared exposures with EPA's
2 MCL of 5 micrograms per liter for PCE. In 1985, EPA
3 classified PCE as a probable human carcinogen and its
4 policy is to assign a public health goal of zero exposure
5 for such chemicals. The analytical feasibility of
6 measuring PCE was considered in the setting of the MCL and
7 5 micrograms per liter was selected because it was judged
8 to be the lowest concentration that could be reliably
9 detected. Thus, the MCL is not based on toxicologic or
10 epidemiologic data. Did I read that correctly?

11 A Yes.

12 Q And what was the reason that the committee
13 included this paragraph?

14 MR. TELAN: Object to the form.

15 A Again, it's to really provide sort of a context
16 for the level of concern warranted regarding the Camp
17 Lejeune exposure. It's not presented as a precise
18 comparison, but rather sort of to put it into context.

19 Q And what's the significance of the statement that
20 the MCL is not based on toxicologic or epidemiologic data?

21 MR. TELAN: Object to the form.

22 A We thought it was important that it be -- not be
23 cited or interpreted as it's safe below it and it's harmful
24 above it. It's not got that kind of a purpose.

25 Q And in the same vein, if you could take a look at

1 page 132 of the report.

2 A Okay.

3 Q And do you see there's a section called Allowable
4 Limits of Volatile Organic Compounds in Drinking Water?

5 A Yes, I do.

6 Q And it's referring again to the MCLs for the VOCs
7 in drinking water, including TCE and PCE that were
8 developed in the mid-1980s. Do you see that?

9 A Yes, I do.

10 Q Do you see where it discusses -- and this is in
11 line with the paragraph you just or we just discussed --
12 that TCE and PCE fall into category 1, so the MCLG by
13 definition equals zero as an aspirational goal. Do you see
14 that?

15 A I see that, yes.

16 Q And it also says that economic considerations for
17 water treatment were also deliberated?

18 A Yes.

19 Q And is this consistent with your understanding of
20 how the -- is this paragraph in whole consistent with your
21 understanding of how the MCLs were set?

22 A Again, I don't have background expertise. I
23 accept the description there as is indicated.

24 Q Why did the committee believe it was important to
25 include this information about how the MCLs were set in the

1 report?

2 A Again, I think broadly, we were trying to help to
3 interpret the exposures of concern at Camp Lejeune and
4 really presenting a variety of ways of trying to judge sort
5 of the -- the meaning or the potential importance of those
6 exposures and offering this as one of the benchmarks.

7 Q Okay. If you look into the next paragraph, in
8 that paragraph, it talks about new guidelines being set by
9 EPA for carcinogen risk assessment which incorporate
10 increased scientific understanding of the biological
11 mechanisms that can cause cancer. Can you read the next
12 three sentences into the record?

13 A Let me see where they are.

14 Q In the more than 20 years.

15 A Again, we are in the second paragraph?

16 Q Yes. Starting with the second sentence, in the
17 more than 20 years.

18 A Okay. In the more than 20 years since the
19 original MCLs were established, considerable kinetic and
20 biologic mechanism of action information on TCE and PCE has
21 been published, as reviewed in the present report. There
22 are different approaches to risk assessment that yield
23 different results. Continue?

24 Q Yes, please continue.

25 A At least one recent study has explored different

1 approaches, including the use of contemporary published
2 elements of TCE's biologic mode of action and a cancer risk
3 model that was the best fit to the data, Clewell and
4 Andersen, 2004. The latter approach yielded a TCE
5 concentration of 265 micrograms per liter in drinking
6 water, below this concentration, a carcinogenic hazard to
7 human health was deemed unlikely. This is one example of a
8 possible application of toxicologic and mechanistic
9 biologic data to a cancer health risk assessment for TCE
10 which yields a value greater than one based on analytical
11 limits of detection.

12 Q Okay. Were you aware of this work that had been
13 done or is this something that's in the realm of the
14 toxicologist who worked on the report?

15 A It's really within the realm of toxicology which
16 sort of overlaps with risk assessment.

17 Q Were you aware generally of the range of
18 concentrations that had been determined through the
19 historic water modeling that had been done by ATSDR with
20 the Tarawa Terrace water treatment plant?

21 A Again, I was aware that modeling had been done,
22 but not in any detail.

23 Q And were you aware that there was a different part
24 of the base where at the time of this report modeling had
25 not been done known as Hadnot Point?

1 A I am aware of the differences in the -- where
2 things stood in the way of exposure reconstruction at the
3 two areas and the two locations.

4 Q Do you recall the committee's recommendation
5 regarding whether the water modeling project for Hadnot
6 Point should go forward?

7 A I recall a general recommendation that -- that it
8 be -- you know, that it be as rapid and simple as -- within
9 the bounds of what's feasible, so they are trying to
10 reconcile the intensity of effort with the product and to
11 focus on what would be feasible to produce in a relatively
12 shorter period of time.

13 Q Okay. Let's turn to Chapter 7 starting on page
14 180.

15 EXHIBIT TECHNICIAN: Can you say the page number
16 again?

17 MR. BAIN: 180.

18 Q And this section covers the Integration of the
19 Findings from the Toxicologic and Epidemiologic Literature;
20 is that correct?

21 A Yes, that's correct.

22 Q Why did the committee perform this analysis?

23 A Well, really trying to at least informally
24 integrate the evidence from the two major lines of health
25 research addressing these chemicals.

1 Q Was there any particular methodology that the
2 committee used in performing this analysis?

3 A As I recall, it was, again, a matter of
4 interpretation, but not a specific kind of off the shelf or
5 quantitative methodology.

6 Q Can you elaborate on that a little bit?

7 A Well, we would sit down and talk about it outcome
8 by outcome and try to characterize the -- the evidence,
9 which the previous chapters did, and to sort of take stock
10 of where the evidence was consistent or sort of where we
11 could relate them well to one another, were they perhaps
12 diverged in trying to just make a -- really interpret the
13 comparability of the lines of research.

14 Q Did the committee do anything nonstandard or
15 unusual in doing that integration?

16 A No, I don't think so. It's a -- again, it's
17 trying to reconcile the two streams of evidence by
18 discussing it.

19 Q Based on the integration and analysis that the
20 committee did, did it find sufficient evidence to suggest a
21 causal inference for any of the health effects it reviewed?

22 MR. TELAN: Object to form.

23 A Well, again, no, but remember, even within the
24 framework, the step up from where we got to limited and
25 suggestive was whether an association had been established

1 and then potentially elevating it upwards further based on
2 the biologic or mechanistic data, but it was still
3 fundamentally relying on the epidemiologic evidence to
4 position it. This could bump it up even higher if such --
5 if it was warranted.

6 Q So based on the epidemiologic review, the
7 committee did not find any of the diseases fell even in the
8 association category, not to mention the causal category,
9 right?

10 MR. TELAN: Object to the form.

11 A That's right, we were -- we got to the
12 limited/suggestive category, but not above that category.

13 Q And did the integration of the toxicologic
14 analysis bump any of the diseases up to the -- even the
15 association category?

16 A Well, in the algorithm, it's not a very formal
17 role for the animal evidence in doing that. The algorithm
18 is really driven by the epidemiology. Until you get to the
19 highest level where the epidemiology has clearly
20 established an association, then there's a bigger role for
21 the toxicology.

22 Q Right. Because if you look at that highest level,
23 there's a reference to biologic plausibility and other
24 factors that might be informed by toxicology?

25 A That's right, the step before that is for the

1 epidemiology to be able to effectively rule out bias and
2 chance and assert more confidently an association has been
3 established and then the next step beyond that is to make a
4 judgment about whether that association is likely to be
5 causal or not.

6 Q Let's turn to Chapter 8 on page 184. Do you see
7 the chapter entitled Studies of the Camp Lejeune
8 Population?

9 A Yes, I do.

10 Q At the time the committee did its work, it was
11 aware that there had been some health studies done on the
12 Camp Lejeune population that focused on health effects in
13 people who were exposed as children or while their mothers
14 were pregnant with them; is that correct?

15 A The one completed study -- I believe the only
16 completed one was concerned with prenatal exposure and
17 birth outcomes. There was a study in progress looking at
18 children's health outcomes, selected children's health
19 outcomes.

20 Q Okay. So the study that had been completed was on
21 birth outcomes and the study that was being planned was on
22 childhood cancers; is that right?

23 A There was a study that was ongoing looking at
24 birth defects which was a different --

25 Q Okay.

1 A -- category, you know, based on prenatal exposure,
2 but also then looking at childhood cancers, which I can't
3 remember if they specified could be related both to
4 prenatal and post-natal exposure.

5 Q Do you recall the committee having concerns about
6 the statistical power of the studies of birth defects and
7 childhood cancer?

8 A Yes.

9 Q And what do you recall those concerns being?

10 A Well, these were -- these are very rare outcomes,
11 fortunately, and with the size of the study that they were
12 doing, we noted that they would really only be capable of
13 detecting very large elevations in risk, and on that basis,
14 were concerned that they would not be -- they would be
15 limited in their information value at the end when they
16 were completed.

17 Q And that's just because of the numbers that were
18 available in the study?

19 A Numbers available were quite small. Even in
20 conducting thousands of interviews, they were only able to
21 identify a relatively small number of cases.

22 Q Did the committee also have concerns about the
23 feasibility and utility of other future studies of the Camp
24 Lejeune population?

25 A At the time, with what we knew, we -- we

1 questioned -- we questioned the feasibility, not because we
2 had necessarily determined it wasn't feasible, but normally
3 you would look to sort of the burden of proof to show that
4 this is really going to work as planned. And a number of
5 these were at a very early stage of their development, so
6 there wasn't a clear plan, you know, that one might
7 normally see.

8 Q And when you reference the burden of proof which
9 is a legal term, what did you mean by that?

10 A I mean -- well, when we write a grant let's say in
11 another context when applying to the National Institute of
12 Health to do a study, we have to not only get -- show that
13 it's an important issue to study and an exciting idea, but
14 we have to demonstrate that we will be able to execute the
15 study, we may do some pilot work, we might make
16 calculations, how many cases will we expect to find,
17 there's a lot of ways you build confidence that it will
18 work as planned. And what we were concerned with, critical
19 of was saying at this point in time, as of 2008, there were
20 intentions, but there wasn't a clear plan that would
21 convince us or someone else that this really can work and
22 will work as we -- as we wish.

23 Q Did you review some materials from the ATSDR
24 regarding what they intended to do and what they thought
25 was the feasibility of the plans that they intended?

1 A We reviewed the materials that were provided, but
2 for the future studies, we were -- it was not entirely
3 reassuring at that time. Again, this is quite some time
4 ago, but based on the materials we received, we were not --
5 we did not find that compelling to show that it would work
6 as they would intend it to.

7 Q The committee was informed that the ATSDR was
8 contemplating doing a health survey, a cancer incident
9 study and a mortality study, right?

10 A That's correct, yes.

11 Q Let's talk first about the survey that was
12 proposed. Were you aware that Congress had directed the
13 government to perform a health survey?

14 A I don't -- I don't recall -- I don't recall
15 whether that was the motivation for pursuing that, but yes.

16 Q What was the committee's understanding of the type
17 of information that the survey would gather?

18 A Well, by definition, a health survey is going to
19 be self-reported information on symptoms or diseases that
20 may have occurred, the health experience of the study
21 participants.

22 Q Okay. If I could direct your attention to page
23 12. Are you there?

24 A Yes.

25 Q Okay. If you look at the first full paragraph, it

1 starts the committee also reviewed. Can you read that
2 paragraph into the record?

3 A Yes, the committee also reviewed ATSDR's plans for
4 a health survey that was generated in response to a
5 Congressional directive. The survey would seek information
6 on residential history and various health outcomes.
7 Although the survey could contribute to designing future
8 studies at Camp Lejeune, its success depends on getting
9 adequate participation, at least 60 percent. Even if
10 satisfactory participation is achieved, there are concerns
11 that there could be bias in the reported data because
12 people who have experienced disease or illness are more
13 likely to participate in the survey.

14 Q Why did the committee remark that at least
15 60 percent participation in the survey was necessary?

16 A Again, it's an arbitrary figure, but we were
17 trying to acknowledge both that it's not going to be
18 100 percent, but it's -- that's sort of a lower bound of
19 where you would maybe have more confidence in. As I said,
20 it's an arbitrary cut point.

21 Q And what is the significance to the committee of
22 concerns that there could be bias in the reported data
23 because people who have experienced disease or illness are
24 more likely to participate?

25 A Well, again, this is a general sort of phenomenon

1 in epidemiologic studies, when you try to recruit people
2 for participating in a study that's driven by any kind of
3 exposure and -- the ones who are willing to participate
4 very often will be those who have suffered a health
5 problem. It's more salient to them. They want to get
6 their story out. They are more motivated than someone who
7 is completely healthy and not going to be as interested,
8 all other things being equal.

9 Q Okay. If you look down to the next paragraph, I
10 think you talk about some of the other studies that were
11 planned. Can you read the first three sentences of that
12 paragraph into the record?

13 A After reviewing the study plans and feasibility
14 assessments, the committee concluded that most questions
15 about whether exposures at Camp Lejeune resulted in adverse
16 health effects cannot be answered definitely with further
17 scientific study. There are two main reasons for this.
18 First, it is not possible to reliably estimate the
19 historical exposures experienced by people at the base.

20 Q Okay. Stop there.

21 A Okay.

22 Q What was the basis of the statement there that
23 it's not possible to reliably estimate historical exposures
24 experienced by the people at the base?

25 MR. TELAN: Object to the form of the question.

1 A Well, again, there are -- this exposure as of 2008
2 had already occurred and ended a long time ago, so we are
3 in the business of trying to reconstruct something that
4 happened historically, and although there are tools for
5 modeling groundwater dissemination and movement and so on,
6 it is limiting in the precision or the refinement that's
7 possible. It's also -- there was very little measurement
8 data, so even when you develop the model, you can't -- it's
9 very hard to show it's correct without some measurement
10 data to relate it to, so it was acknowledging that problem.
11 And again, we may have overstated our ability to predict
12 the future or what is and isn't feasible, but at this point
13 in time, we were certainly aware of how long this had been
14 going on and how impatient -- understandably impatient
15 everybody was to bring this to some kind of resolution, so
16 we may have been overly sort of prescriptive in
17 encouraging -- sort of acting based on what's known rather
18 than based on what might some day in the future become
19 known. That was I think a little bit of the spirit behind
20 that.

21 Q Okay. And I'm going to ask you to talk about some
22 of the other things in that paragraph, but first, I want to
23 take a look in relation to this to page 16. And this is
24 talking about the modeling of the contamination
25 concentrations at Camp Lejeune, and if you look at the

1 first full paragraph on page 16, can you read the first
2 four sentences there into the record?

3 A The committee concluded that ATSDR applied
4 scientifically rigorous approaches to address the complex
5 groundwater contamination scenario at Tarawa Terrace. The
6 outcome of the modeling was monthly estimates of the
7 concentrations of contaminants in the water supply to which
8 people could have been exposed. Although ATSDR recognized
9 and tried to account for the limitations and uncertainties
10 associated with its models, the committee judges that,
11 because of the sparse set of water quality measurements,
12 the need to make unverifiable assumptions and the complex
13 nature of the PCE source, it is virtually impossible to
14 estimate exposure to historical levels of PCE and its
15 degradation products accurately. Continue?

16 Q Yeah, just the next sentence.

17 A Reporting precise values based on model
18 predictions gives the misleading impression that the
19 exposure of the former residents and workers at Tarawa
20 Terrace during specific periods can be accurately defined.

21 Q And so that is for the modeling that already had
22 been done for Tarawa Terrace with respect to PCE, correct?

23 MR. TELAN: Object to the form.

24 A That's what that is referring to, yes.

25 Q And you were aware that modeling had not been

1 completed for Hadnot Point as of that time, right?

2 A Yes, that was the case, we were aware of that.

3 Q And if you look down at the next sentence
4 discussing Hadnot Point, can you just read the first
5 sentence of that section?

6 A The water supply contamination scenario for Hadnot
7 Point is much more complex than that for Tar -- I'm not
8 sure I'm pronouncing it right -- Tarawa Terrace because
9 there were multiple sources and contaminants.

10 Q And would that have made as far as you are aware
11 it more difficult to model Hadnot Point than it had been
12 for Tarawa Terrace?

13 MR. TELAN: Object to the form of the question.

14 A The exposure scenario and the sources were more
15 complex, and therefore, it would be more challenging to --
16 to approximate exposure.

17 Q Okay. Going back to page 12 -- and this again is
18 the paragraph that is discussing the feasibility of doing
19 future studies for Camp Lejeune. And you are discussing
20 the reasons that it cannot be answered -- the adverse
21 health questions cannot be answered with further scientific
22 study. Do you see where -- the sentence that starts with
23 second? Can you read that and the next couple sentences
24 into the record?

25 A Second, it would be difficult to detect any

1 increases in the rate of diseases or disorders in the study
2 population. Most of the health effects of concern are
3 relatively rare which means that very large numbers of
4 people are needed to detect increased cases.

5 Q Can you go onto the next sentence?

6 A Yes, although the total number of people who have
7 lived at Camp Lejeune while Tarawa Terrace and Hadnot Point
8 water supplies were contaminated is sizeable, the
9 population is still unlikely to be large enough to detect
10 effects other than common diseases or disorders of concern.

11 Q Can you stop there? When the committee says the
12 population is still unlikely to be large enough to detect
13 effects other than common diseases or disorders of concern,
14 why did the committee consider this to be a concern
15 regarding the feasibility and utility of the proposed
16 studies?

17 MR. TELAN: Form objection.

18 A Well, this would really pertain to utility, not
19 feasibility.

20 Q Okay.

21 A And the utility is -- obviously you need a
22 sufficient number of events for the results to be precise
23 or adequately precise and there are different ways to
24 characterize that, but if the study is not big enough to
25 have a good chance of detecting an adverse effect if one is

1 really present, then you can question the value of the
2 study because negative results aren't going to be
3 reassuring which -- which is -- so that is the concern
4 about what is the study capable of doing.

5 Q And that concern about being able to produce value
6 given the size of the population being studied, that
7 doesn't change with time, right?

8 MR. TELAN: Objection to form.

9 Q That was a consideration in 2009 and it would
10 still be the same consideration today?

11 MR. TELAN: Object to the form of the question.

12 A Actually it does change because they get older.

13 Q Uh-huh.

14 A And unfortunately, for some of us, as you get
15 older, the disease rates go up, and so every -- you know,
16 the initial exposures occurred to many young people
17 relatively speaking, and as the years go by, there will be
18 increasing numbers of cancers and neurologic diseases and
19 all the diseases that occur with aging, so the passage of
20 time in that sense you can say adds in information.

21 Q Did the committee have any understanding at the
22 time when these studies would be done and when they were
23 proposed to be completed?

24 A That was not clear at the time and that's where it
25 was sort of -- again, the level of information we got, we

1 didn't see it as being sufficient to say, you know, a study
2 executed right now in 2008 will or will not be informative.
3 Obviously it's a completely different question if it were
4 2022 or 2023 or 2024, you could ask the same question and
5 it would surely have a different answer.

6 Q Okay. And if you look back at page 12, the next
7 sentence, another factor, can you read that sentence into
8 the record?

9 A Yes. Another factor is that the population is
10 relatively young, so many who would be studied are in an
11 age range in which chronic diseases are rare.

12 Q Okay. If you can stop there. That's what we just
13 discussed, right?

14 A That's correct, yes.

15 Q So as time goes on, you would expect to see just
16 because of age more diseases; is that right?

17 MR. TELAN: Object to the form of the question.

18 A Again, with age, there will be more cases.
19 Whether -- whether or not there's an effect of their
20 exposure, that is not -- this is going to mean that there
21 will be -- that the study will be more informative
22 regarding whether there is an effective exposure if it has
23 more cases of the outcomes we are interested in.

24 Q Okay. And if you could read the next -- the next
25 sentence into the record.

1 A Yet another factor is that the people tended to
2 live on the base for a relatively short time, resulting in
3 a small increase in risk of disease at most, making it
4 difficult to rule out other exposures or factors that
5 could -- that could have contributed to disease or illness.

6 Q Okay. And why did the committee state that living
7 at the base for a relatively short time would result in a
8 small increase in risk of disease at most?

9 MR. TELAN: Object to the form.

10 A I mean in general, the exposures are usually sort
11 of characterized by intensity and duration, and even if the
12 exposure was of high intensity, it was -- again, it varied
13 across individuals. For the -- for the service personnel,
14 it may have been shorter than let's say for the civilian
15 personnel, that's a different issue, but two years or three
16 years or five years is relatively short compared to the
17 magnitude of duration that is often studied in working
18 populations where there may be people there 10 years, 20
19 years or 30 years, so it was recognizing that the studies
20 that are done should be capable of detecting relatively
21 modest effects, not just extremely large effects, and
22 that's a function of the study size.

23 Q Okay. And why did the committee state that living
24 a short time at the base would make it difficult to rule
25 out other exposures or factors that could have contributed

1 to disease or illness?

2 MR. TELAN: Object to the form.

3 A I'm not sure there is anything unique about that
4 issue. I'm not sure potential of these other factors, you
5 know, as we call them, confounding factors is any greater
6 or lesser than it would be otherwise. In general, when you
7 are looking for a small effect, it's harder to be confident
8 that it is really due to the exposures and not due to some
9 other subtle factor, so it's more the magnitude that's --
10 like in the Bradford Hill considerations, high magnitude
11 makes confounding less likely.

12 Q And this concern with respect to the fact that
13 people tended to live on the base for a relatively short
14 period of time affecting the feasibility of these
15 contemplated studies, that's the same in 2009 as it is
16 today, right?

17 MR. TELAN: Object to the form.

18 A Obviously the magnitude of exposure -- the
19 exposure ended in 1985 no matter what, so whatever
20 limitations there are based on the magnitude of exposure
21 that were there in 2008 would still be there today. There
22 may be refinements in the modeling, there may be all sorts
23 of other improvements, as I think there have been in some
24 cases over time, but it remains a population that was
25 exposed for a limited period of time.

1 Q Okay. And can you finish reading that paragraph
2 into the recording starting with all these factors?

3 A Yes. All these factors make it unlikely that the
4 proposed studies even if the notable uncertainties about
5 feasibility are resolved favorably will produce results of
6 sufficient certainty to resolve the question of whether
7 Camp Lejeune residents suffered adverse health effects from
8 exposure to contaminated water.

9 Q Would these concerns have been characterized as
10 both an inability to generate results of sufficient
11 statistical power and an inability to sufficiently account
12 for bias?

13 MR. TELAN: Object to the form.

14 A I mean we were -- again, we were projecting an
15 unknown future based on what we knew at the time and I
16 think that, again, as I said in another context, we were
17 trying to in a sense lower expectations because of the
18 hunger for definitive -- for closure on this, and so what
19 we were indicating with those kinds of statements is that
20 even if they do this, it's not going to bring this issue to
21 closure based on definitive epidemiologic results. We
22 didn't say whether they might contribute, they might be
23 informative, but we were trying to make clear that -- that
24 sort of the effort to find some closure should not await
25 these future incompletely planned studies.

1 Q Do you recall the committee reviewing the ATSDR
2 2008 report on the feasibility of conducting the future
3 epidemiologic studies?

4 A I do recall reviewing the information that was
5 provided which was -- we found to be incomplete in its --
6 in its addressing of the feasibility.

7 Q Do you recall the report including statistical
8 power calculations for certain cancers of interest,
9 including kidney cancer, nonHodgkins lymphoma, leukemias
10 and other cancers?

11 A I don't recall that report in detail. We did
12 review it at the time, but I don't recall it now.

13 Q Okay. So you did have access to the report and it
14 wasn't sufficient to alleviate the concerns that were
15 referenced here?

16 MR. TELAN: Object to the form.

17 A That's correct, we reviewed it and took that into
18 account in reaching our assessment that's reported there.

19 Q Okay. As I think we noted previously, there's an
20 entire chapter of the report, Chapter 8, beginning on page
21 184, that addresses the current and future health studies
22 of the Camp Lejeune Population?

23 A Yes.

24 Q Okay. And I want to direct your attention to the
25 last page of that chapter which is 197. And on this page,

1 it discusses some of the same limitations that we just went
2 over. And at the end of the first set of recommendations,
3 let me see if I can find it here, it's the very end of the
4 first set of recommendations, do you see where it says
5 conduct of research that is deficient in those respects not
6 only would waste resources, but has the potential to do
7 harm by generating misleading results that erroneously
8 implicate or exonerate the exposures of concern?

9 MR. TELAN: Form objection.

10 A Where are we on that page?

11 Q Do you see the recommendations?

12 A Yes.

13 Q It's right above that.

14 A Okay. Yes, I see that.

15 Q Can you elaborate on what the committee meant by
16 potential to do harm by generating misleading results that
17 erroneously implicate or exonerate the exposures of
18 concern?

19 MR. TELAN: Form.

20 A I think that's really back to the issue of the
21 desire for clear information -- clear scientific
22 information is kind of setting things up so that -- for the
23 misinterpretation of evidence, so that if the studies are
24 done and they show no adverse effects, it may be
25 interpreted as somehow saying the exposure did no harm, and

1 we are saying that we don't know that the studies are
2 capable of that, in the same way that if they show
3 associations or show adverse effects, well, it's part of
4 the array of data, but it's not the final definitive proof,
5 it's not 100 percent certainty now. It weighs in -- each
6 of them sort of weighs in the direction that the results
7 point, but given the inherent challenges, there was a
8 concern that they will be given -- whatever they find, they
9 will be given too much weight. That was I think the
10 concern there.

11 Q Okay. Turn back to page 12, if you will. If you
12 look back at the last paragraph of this section here or
13 this page, can you read the first sentence into the record?

14 A The available scientific?

15 Q Yes.

16 A The available scientific information does not
17 provide a sufficient basis for determining whether the
18 population at Camp Lejeune has in fact suffered adverse
19 health effects as a result of exposure to contaminants in
20 the water supplies. Continue?

21 Q Well, in this paragraph of the report, did the
22 committee identify several lines of scientific reasoning to
23 suggest that health effects as a result of exposure to
24 contaminated water at Camp Lejeune were unlikely to have
25 occurred?

1 MR. TELAN: Object to the form.

2 A I'm not sure. Are you asking me to read further?

3 Q Yeah, why don't you just go ahead and read -- this
4 is kind of a conclusory paragraph. Read this paragraph for
5 the record. I'm sorry, it's kind of long.

6 A On the one hand, several lines of scientific
7 reasoning suggest such effects are unlikely to have
8 occurred. The evidence includes a substantial body of
9 research on the toxicology of TCE and PCE that indicate
10 that the exposures required to cause adverse health effects
11 in laboratory animals were much larger than the highest
12 measurements available on the Camp Lejeune water supplies,
13 evidence that humans have lower sensitivity to TCE and PCE
14 than rodents, epidemiologic data largely from occupational
15 settings with higher, longer-term exposures to TCE and PCE
16 that has not generated compelling evidence of adverse
17 health effects, and the relatively short-term intermittent
18 nature of the exposures incurred at Camp Lejeune.

19 Q Okay. To be fair, why don't you go ahead and read
20 the rest of the paragraph.

21 A Okay. On the other hand, the possibility that
22 health effects have been produced by the contaminant
23 exposures at Camp Lejeune cannot be ruled out. Some
24 effects of TCE or PCE exposures might have occurred below
25 the level of detection in toxicologic studies which focused

1 on single contaminant exposures at high doses, used
2 generically homogenous animal strains and necessarily
3 involved extrapolation across species. In addition, the
4 population exposed at Camp Lejeune is more diverse and
5 possibly more susceptible than those who have been exposed
6 to TCE and PCE in occupational settings, and the actual
7 concentrations of PCE and TCE and the presence of
8 additional water contaminants are poorly documented and
9 thus could be higher or more complex than the limited
10 historical measurements suggest. There were divergent
11 views among the committee members about the probability
12 that each would assign to whether adverse health effects
13 have in fact occurred, but there was consensus among them
14 that scientific research is unable to provide more
15 definitive answers to that question.

16 Q Thank you. And then just to wind up, if you go
17 over to the last part of the public summary, there's
18 conclusions and recommendation, if you could read that for
19 the record.

20 A Yes, it cannot be determined whether -- reliably
21 whether diseases and disorders experienced by former
22 residents and workers at Camp Lejeune are associated with
23 their exposure to contaminants in the water supply because
24 of data shortcomings and methodological limitations and
25 these limitations cannot be overcome with additional study.

1 Thus, the committee concludes that there is no scientific
2 justification for the Navy and Marine Corps to wait for the
3 results of additional health studies before making
4 decisions about how to follow-up on the evident solvent
5 exposures on the base and their possible health
6 consequences. The services should undertake the
7 assessments they deem appropriate to determine how to
8 respond in light of the available information.

9 Q Thank you, Dr. Savitz. Just a few more exhibits
10 to show you. I think I'm -- I might be done with
11 Exhibit 2.

12 (Exhibit No. 10, Public Summary and Context Report in
13 Brief, marked for identification.)

14 Dr. Savitz, I'm showing you what's been marked as
15 Exhibit 10. This is entitled Public Summary and Context
16 Report in Brief. Do you see that?

17 A Yes, I do.

18 Q As the chairman of the committee, did you review
19 this document before it was issued by the National
20 Academies?

21 A Yes, I believe I did.

22 Q Do you recall having any reservations at all about
23 the statements in this document?

24 MR. TELAN: Object to the form.

25 A Again, I don't recall -- I remember the

1 opportunity for input. I don't remember in finer detail
2 than that at this point given how long -- how long ago it
3 was.

4 Q Okay. Was this -- as far as you are aware, was
5 this intended to be a summary that could be provided to the
6 public of the work that your committee did?

7 A Yes, I mean, again, as the title indicates, Public
8 Summary and Context.

9 Q Okay. And can you look at the last page and read
10 the conclusions and recommendations into the record?

11 A Conclusions and recommendations. It cannot be
12 determined reliably whether diseases and disorders
13 experienced by former residents and workers at Camp Lejeune
14 are associated with their exposure to contaminants in the
15 water supply because of data shortcomings and
16 methodological limitations and these limitations cannot be
17 overcome with additional study. Thus, the committee
18 concludes that there is no scientific justification for the
19 Navy and Marine Corps to wait for the results of additional
20 health studies before making decisions about how to
21 follow-up on the evidence solvent exposures on the base and
22 their possible health consequences. The services should
23 undertake the assessments they deem appropriate to
24 determine how to respond in light of the available
25 information.

1 MR. BAIN: Okay. And lastly, I would like to
2 mark this as Exhibit No. 11.

3 (Exhibit No. 11, News Release, June 13, 2009, marked
4 for identification.)

5 Q Dr. Savitz, I'm showing you what's been marked as
6 Exhibit No. 11. Do you recognize this as a National
7 Academy of Sciences press release?

8 A Yes, I do.

9 Q And do you recall being consulted on this press
10 release?

11 A Again, yes, I would have been as a routine matter,
12 and as chair of the committee, I would have a chance to go
13 over it.

14 Q And do you see that you're quoted in the second
15 paragraph of this news release?

16 A Yes.

17 Q And can you read that paragraph into the record?

18 A Quote, even with scientific advances, the complex
19 nature of the Camp Lejeune contamination and the limited
20 data on the concentrations in water supplies allow for only
21 crude estimates of exposure, end quotes, said David Savitz,
22 chair of the committee that wrote the report and professor
23 in the Department of Community and Preventative Medicine at
24 Mount Sinai School of Medicine, New York City. Quote,
25 therefore, the committee could not determine reliably

1 whether the diseases and disorders experienced by former
2 residents and workers at Camp Lejeune are associated with
3 their exposure to the contaminated water supply.

4 Q Okay. Thank you. Do you recall the ATSDR writing
5 a letter to the Department of Navy with commentary on the
6 National Academy of Sciences report for which you were
7 committee chair?

8 A Again, I don't recall the details of that, but I
9 do recall a letter being sent that was critical of our
10 report, but nothing more than that at this point.

11 Q Do you recall your reaction to that letter?

12 A Well, I don't -- again, once the committee is out
13 of business, we are out of business, so I'm reacting as a
14 former committee member. The Academy staff I believe has
15 their own approach to responding to that. I certainly --
16 again, I just remember being critical and that -- not
17 surprising, but there was -- in a report of this nature,
18 you kind of go into it expecting there will be a variety of
19 responses, whatever -- whatever we have to say.

20 Q Were you involved in formulating any response to
21 that letter?

22 A I don't think so. I don't know for sure if there
23 was any discussion with Dr. Martel in her -- her
24 generating -- again, I honestly don't recall if she
25 generated a formal written response or not, and I don't

1 recall if she did, whether we conferred on that response.

2 Q Have you been retained as a consultant in this
3 litigation?

4 A I have, yes.

5 Q And who retained you?

6 A It was with -- again, I remember the initial call
7 was in 2022 with a representative of the firm that
8 Mr. Telan works with.

9 Q Mr. Who?

10 A Patrick.

11 Q And have you worked with Patrick on any prior
12 cases?

13 A Yes, I have.

14 Q What cases were those?

15 A There was one that was -- I'm sorry, I'm blocking
16 it out already, it's a long day, but it's a case involving
17 a medical treatment and medical malpractice case.

18 Q Okay. And have you been retained on any prior
19 cases by Ms. Greenwald before?

20 A Yes, sometime ago involving a PFAS.

21 Q Okay. And I don't want to get into any details,
22 but approximately how many hours have you spent consulting
23 for counsel to date?

24 A I'm sorry, for this particular case?

25 Q Yep.

1 A Oh, gosh, this is a rough guess, maybe in total 15
2 hours, maybe 20 hours, something in that ballpark.

3 Q And have you been told whether you are expected to
4 provide an expert report?

5 A It has not evolved to that point.

6 Q Okay. We might see you again.

7 A That's possible.

8 Q What rate are you charging counsel?

9 A I charge \$500 an hour for my time.

10 Q Since the time you've been retained, have you had
11 any contacts with Jerry Ensminger?

12 A No, I have not.

13 Q Mike Partain?

14 A No, I have not.

15 Q Morris Maslia?

16 A No.

17 Q Frank Bove?

18 A No.

19 Q Christopher Portier?

20 A No.

21 MR. BAIN: Okay. I think I'm almost done. I
22 want to take a break and talk to my colleague.

23 THE VIDEOGRAPHER: Off the record at 3:42.

24 (A short break was taken.)

25 THE VIDEOGRAPHER: We are back on the record at

1 3:50. Media number 5. Please proceed.

2 Q Okay. Back on the record. Dr. Savitz, I just had
3 one more thing to ask you. We talked about before the
4 break your knowledge that ATSDR had sent a letter with some
5 critiques of your report to the Navy. Do you recall that?

6 A Yes, I do.

7 Q And did you ever read a copy of that letter?

8 A I believe I did at the time. I haven't in at
9 least 15 years, but I did read it I believe when it was
10 received.

11 (Exhibit No. 12, Letter, 10/22/10, marked for
12 identification.)

13 Q Okay. And so we have placed before you
14 Exhibit 12. If you take a minute to look at that and just
15 ask you to identify it, do you recall that's the letter you
16 reviewed?

17 A Again, it's a long letter. Again, I have every
18 reason to believe it is the letter that was sent and that I
19 reviewed when it was first out.

20 Q But as I think you said before the break, you
21 didn't prepare any type of written response to the letter?

22 A No, I did not.

23 Q Did you have any discussions with Ms. Martel or
24 anyone else about it?

25 A That's what I cannot recall, again, whether I was

1 engaged informally, you know, to address the point or not.

2 MR. BAIN: Okay. Thanks very much, Dr. Savitz.
3 I don't have any further questions. I appreciate your time
4 and patients with so much reading today.

5 THE WITNESS: Thank you.

6 MR. BAIN: Thank you very much.

7 EXAMINATION BY ATTY. TELAN:

8 Q Dr. Savitz, we had a little discussion out in the
9 hallway and Mr. Bain and I just spoke a bit. What the plan
10 will be -- because I have a few hours of questioning in
11 front of us and given the time and the fact that you've
12 been here almost seven hours already is we are going to try
13 to clear the decks of just a couple of general matters and
14 then come back to address a couple hours of specific
15 questions, if you are okay with that.

16 What I would like to do is just start to talk to
17 you a bit about the process of the formation of the NRC
18 committee, so we will kind of start there. Is it correct
19 that you had no input into the composition of the committee
20 itself?

21 A That's correct, I mean when I am invited to chair
22 the committee, it's -- there may be one or two unresolved
23 members yet to be decided, but that's being handled by the
24 NRC staff independent of me. They are making their
25 decisions. The most input I would have is to comment on

1 maybe whether we have the right mix of expertise and so on,
2 but I don't nominate people, I don't approve or disapprove
3 people, that goes on all behind the scenes as far as I'm
4 concerned.

5 Q And do you know what involvement Ms. Martel might
6 have had in that decision?

7 A I assume she's centrally involved in that. I
8 assume that she is the recruiter of the committee. I'm
9 sure she confers with her colleagues. I don't know who
10 else is involved, but my assumption is that she's the point
11 person for constituting the committee.

12 Q In terms of your background, Mr. Bain went through
13 a bit of your education and training. You are by training
14 and education an epidemiologist, correct?

15 A That's correct, yes.

16 Q Are you a toxicologist?

17 A I am not.

18 Q Have you ever held yourself out as a toxicologist?

19 A No, I have not.

20 Q So to the extent today that you were asked
21 questions about conclusions reached -- conclusions or
22 opinions reached within the realm of toxicology, would you
23 defer to toxicologists on those specific issues?

24 A I -- I would and did, as a committee member, when
25 I sign off and approve the consensus report, in essence,

1 that is deferring to the experts working in areas outside
2 of mine, including the toxicologists.

3 Q The same questions relative to water modeling, you
4 are not a civil engineer by training, correct?

5 A No, that's right, and again, deferring to those
6 with -- on the committee with expertise in those areas.

7 Q So any analysis of the reliability or the process
8 involved by the ATSDR in their water modeling, you wouldn't
9 have any opinions or critique of that; is that correct?

10 A No, the most involvement we have in areas outside
11 our own is when the experts offer their opinion, we do have
12 an opportunity to discuss it and make sure we understand
13 it, raise questions, but it's always in the mode of looking
14 to them as the experts in that area on behalf of the
15 committee.

16 Q I think you and I are communicating, but I asked
17 the question one way and I think you answered it another.

18 A Okay.

19 Q So let me ask it differently just so we are clear.

20 A Yes, sure.

21 Q Would you defer to a water modeler on whether the
22 ATSDR water modeling was done appropriately and reliably?

23 A Yes.

24 Q And as to the reliability of the toxicological
25 aspects of the report, is that again something you would

1 defer to toxicologists?

2 A Yes.

3 Q Now as it pertains to Ms. Martel -- well, let me
4 strike that.

5 Before joining this particular panel, I think
6 Mr. Bain asked you about your background, training and your
7 prior work with NRC panels, right?

8 A Yes, that's correct.

9 Q Had you ever done any chemical specific research
10 on TCE, PCE, benzene or vinyl chloride before this event
11 that you recall?

12 A You know, it may have been sort of one of the
13 elements of one or more of the papers I had written over
14 the years, but I certainly was not identified as an expert
15 or an experienced researcher in those areas. In fact,
16 there is very often -- particularly for the committee
17 chair -- to make sure that someone is brought in who is
18 sufficiently agnostic and neutral on the issues and that
19 may mean that they have not made it a career focus, the
20 specifics, but that they have the general expertise and
21 perspective to address the issue well.

22 Q Okay. To put it another way, have you held
23 yourself out as an -- as an expert on any of the chemicals
24 in the water at Camp Lejeune?

25 A Not specifically, no.

1 Q Okay. In terms of whether or not there was any
2 consideration given by Ms. Martel to engage any chemical
3 specific experts on this panel, do you know whether or not
4 that was discussed?

5 A It wasn't something that I would have discussed
6 with her, no.

7 Q By the same token, on the flip side, on the health
8 effect side, do you consider yourself an expert on cancer?

9 A Again, I'm conversant with these areas, yes, I
10 have done research on environmental factors and cancer and
11 reproductive outcomes and a lot of different areas. As an
12 epidemiologist, you sort of -- there is maybe more breadth
13 to the territory that we can cover. I have looked at
14 occupational studies, I have looked at community exposures,
15 but not anything that was targeted specifically to the Camp
16 Lejeune issues. Broadly, yes, but not specifically.

17 Q Put another way, in the past, you have done
18 research into cancer, but you have actually never conducted
19 a study specifically determining whether or not a
20 particular chemical like TCE causes cancer?

21 A Again, not -- as I said, I'm trying to think
22 through. I have done studies of environmental exposures
23 and cancer that are more targeted, looking at DDT and
24 cancer, PCPs and cancer and magnetic fields and cancer, so
25 I have done my own studies of that nature. And I have also

1 done broad surveys looking at occupation and cancer that
2 may include dry-cleaners, for example, so I don't want to
3 say that I haven't done work in those relevant areas, but
4 it's not -- again, it's a matter of -- it's broadly, but
5 not -- not targeted studies squarely, you know, on target
6 or analogous to the Camp Lejeune situation.

7 Q But would it be a fair statement that within the
8 broad range of experience that you have as an
9 epidemiologist, your career hasn't been focused on
10 contaminants like TCE, solvents in particular and cancer?

11 MR. BAIN: Object to form.

12 A That's not been a distinctive focus, no.

13 Q Okay. In terms of the sponsor, we have talked
14 about the United States Navy as being the sponsor of this
15 study. Mr. Bain referenced a contract and I was just going
16 to ask you if you ever saw the contract between the United
17 States Navy and the National Academy of Sciences.

18 A To be honest, it's the first contract I have ever
19 seen between a sponsor and the NRC. There's a clear
20 separation of our role as the committee from their role in
21 overseeing -- their being NAS in overseeing and managing
22 the process, so I had no, again, awareness or knowledge of
23 any of the details of the contract. The only thing I know
24 about is the statement of task.

25 Q So you were asked a number of questions about the

1 objectivity of NRC panels. Fair statement that the NRC
2 committee was composed before you were asked to be chair,
3 correct?

4 A That is correct.

5 Q So to a degree, you would have to look at somebody
6 like Ms. Martel to determine whether or not in her
7 selection of candidates, there was any bias that might have
8 influenced selection?

9 MR. BAIN: Object to form.

10 Q Correct?

11 A I mean, again, I would have to look to the NRC
12 broadly. That's their -- they configure the committee and
13 I sort of accept the principle that they are looking for
14 the right expertise and a degree of objectivity. I don't
15 know anything really more than that, but it is a trust that
16 there's not some subtle bias that's been built in. It's
17 not obvious from the knowledge of the -- you know, I
18 know -- knew a number of people before the committee. I
19 got to know them all during the course of the committee of
20 course and the committee's work and I did not have the
21 impression of bias.

22 Q And so when you were asked by Ms. Martel to serve
23 as the chair of the committee, you had mentioned before
24 that there was a desire on the part of the Navy to bring
25 this issue to a close, right?

1 A That was -- became very clear when we heard from
2 the -- the representatives of the Navy that were overseeing
3 this and requesting the assessment, they were seeking
4 guidance to help bring this issue to some closure.

5 Q Were there any particular Navy personnel that you
6 can recall being present and vocal with that?

7 A Again, I can't remember his -- his role or title,
8 but a General in the Marines that was representing and
9 presenting on the charge to the committee. I think that
10 was in the report that was provided, the slides that were
11 provided to me.

12 Q Do you happen to know whether the Navy had any
13 input into the selection of the committee members?

14 A I would have no direct knowledge on that, no.

15 Q If they did, would that be a violation of
16 protocol?

17 A Again, you would have to look at the NRC rules.
18 They are the ones who configure it. I know that they
19 solicit input from multiple sources. I have never --
20 again, I have never participated directly in the formation
21 of a committee, but my understanding is they ask other
22 people from outside the academies, they ask colleagues from
23 within the academy. I don't know if they even -- I think
24 now, they have even put out public invitations, we are
25 configuring a committee on this topic, if you have any

1 recommendations, you broadly, we would be -- you know,
2 welcome your input.

3 Q But whether or not the U.S. Navy had direct
4 involvement in selection of committee members, you have no
5 knowledge one way or the other?

6 A I would have no idea whether they -- again, really
7 whether they did or did not, I would have no idea.

8 Q The decision not to retain any specific cancer
9 experts for this panel, I'm talking about medical experts
10 like oncologists, is that a decision that was made by Ms.
11 Martel?

12 MR. BAIN: Object to form.

13 A Again, implicitly, all the decisions were made by
14 her, you know, through the NRC.

15 Q Okay. During the course of your discussions from
16 the time of the formation of the committee through the
17 conclusion of its report, did you speak to any oncologists
18 who treat cancers of various types?

19 A Again, we heard from a number of people, but I do
20 not -- I do not believe we heard from any -- any clinical
21 experts in any of the relevant health areas.

22 Q In terms of the composition of the panel, there
23 was a discussion about balance. Do you recall that?

24 A Yes.

25 Q Was it your decision to have only one water

1 modeler vis-a-vis numerous toxicologists and
2 epidemiologists or whose decision was that?

3 A Again, like all the decisions, that was made by
4 the NRC before I joined the committee.

5 Q Do you remember specifically -- and I think there
6 was reference by Mr. Bain of presentations being made by
7 Dr. Maslia and Dr. Bove. Do you remember there being
8 presentations made or were there just questions sent to
9 them by -- by the NRC committee that they would have
10 answered?

11 A Again, I believe -- I'm not 100 percent sure --
12 that they would have presented the ongoing work to the
13 committee. I'm almost sure Mr. -- Mr. Bove did, I can't
14 remember Mr. Maslia for sure, but the normal procedure
15 would be for them to present to us and for us to have the
16 opportunity for discussion at the presentation. It may --
17 it could be remote or it could be in person. And then as
18 we are going through our work, if we have additional
19 questions, those would typically be channeled through the
20 NRC, the project director, we would raise our questions,
21 and then in this case, Dr. Martel would contact them and
22 bring back an answer, so I think -- I think we had both the
23 presentation and may well -- I think we may have also had
24 some follow-up questions. I don't recall at this time.

25 Q Dr. Bove like yourself is an epidemiologist?

1 A That's correct, yes.

2 Q Did you know him from before this?

3 A I do not know him personally. I had run across
4 his work before.

5 Q You have --

6 A But I did not know him.

7 Q You have run across his work before, you said?

8 A I had run across his work even before this
9 committee, you know, and looked at his work.

10 Q In terms of the global role of the National
11 Academy of Sciences, is it your understanding that that is
12 an organization that is meant to inform the government on
13 matters involving science?

14 A Broadly, yes.

15 Q Do you have an understanding as to the -- what the
16 mission statement and goal of the ATSDR is?

17 MR. BAIN: Object to form.

18 A Again, only in the broad sense of addressing
19 environmental contaminants and health concerns related to
20 those exposures.

21 Q So do you know specifically whether the ATSDR is
22 tasked with protecting the public from environmental harms?

23 MR. BAIN: Object to form.

24 A I mean that would -- again, I don't have -- I
25 haven't looked at their specific charge, but that certainly

1 would -- I am -- I am familiar with the work they do in a
2 number of areas and it's certainly along those themes of
3 trying to assess and advise regarding environmental hazards
4 and the public health.

5 Q And do you know -- I'm sure you know now -- the
6 ATSDR was in fact conducting a study on Camp Lejeune at the
7 time you were asked by the Navy to -- to perform your
8 review into the Camp Lejeune matter as well?

9 A You mean did I know before I was appointed to the
10 committee?

11 Q Yeah.

12 A Again, I was somewhat familiar with it. I
13 knew there were -- I didn't know honestly in any detail
14 what they were doing, but I knew they had been involved in
15 some of the reproductive health studies.

16 Q Do you know what charge the ATSDR was given as it
17 relates to Camp Lejeune?

18 A I do not.

19 Q In terms of your role as committee chair, is it
20 correct that your role was to make sure that the NRC
21 committee in this case followed the very narrow wording of
22 the charge?

23 A It's sort of all of our obligation, but I think if
24 there is anything distinctive about the role of chair, it's
25 keeping us on target, which means sticking with the

1 statement of task. I might truncate it if we are going way
2 off target, just leading the discussion to make sure we
3 have addressed fully the statement of task, so there is
4 that element of managing the -- the activities and it's
5 partially a way of making sure also that we get the work
6 done on time and the report is complete when it needs to
7 be.

8 Q You were shown what's been marked as Exhibit 4.
9 And I will show this to you. It's a document dated
10 September 6, 2006, which would have been before you were
11 asked to be chair, correct?

12 A That's correct.

13 Q And this document contains -- what is at least
14 visible on page one is an abbreviated statement of the
15 task. Do you see that?

16 A Yes, I do.

17 Q Okay. Hand that back to me.

18 Is that the same or different than what is noted
19 in page one of -- I believe this is Exhibit 3, the NRC
20 report of 2009, where it states the charge to the
21 committee?

22 A This is a truncated paraphrasing of the charge to
23 the committee. It's, you know, the same broadly, but very
24 often the committee reports will actually have verbatim the
25 charge in a box in the report. That was not provided in

1 this report.

2 Q Okay.

3 A This is only a synopsis of it.

4 Q Okay. So where it says in Exhibit 4 that this is
5 an abbreviated statement of the task and where in Exhibit 3
6 it has the charge to the committee, which of those two
7 actually represents the charge to the committee, if any?

8 A I --

9 MR. BAIN: Object to form.

10 A Again, I can't -- I don't know for certain it was
11 this wording, but we are given --

12 Q I'm sorry to interrupt. When you say this
13 wording, you are looking at Exhibit 4?

14 A The abbreviated statement of task from Exhibit 4.
15 I mean we read that, review it. We often revisit it at
16 every meeting and it's a more formal -- the reason I think
17 it's probably the one in Exhibit 4 is that's a much more
18 explicit formal statement. This is kind of a review and a
19 overview of it in the -- in the report itself, and so the
20 committee -- remember, this report didn't exist when the
21 committee was doing its work. We created the report.
22 There was a statement of task before the committee began
23 its deliberations and that's what would have guided us.

24 Q So to the extent though that the charge to the
25 committee at page one is different from what is seen at

1 Exhibit 4, what is at page one wouldn't be entirely
2 complete or accurate then; is that correct?

3 A Well, I don't know about accurate, but certainly
4 not as complete and not as formal and explicit as the -- as
5 statements of task typically are and more like what appears
6 in Exhibit 4 which is here's the scope, here are the issues
7 to address, it's very -- it's very concrete, very specific.

8 Q Is it a fair statement that your committee was not
9 asked to determine whether the exposures to the
10 contaminants at Camp Lejeune and the perceived harms were
11 as likely as not as it relates to the association between
12 those two?

13 MR. BAIN: Object to form.

14 A We were asked to generate the information that
15 would inform an assessment of the health risks faced by the
16 Camp Lejeune population, again, based on what the
17 literature on those chemicals indicated and based on the
18 studies that had been done and would be done, but we were
19 not asked to make a judgment on that -- sort of the final
20 question, did these individuals suffer from adverse health
21 effects, that is not in the charge and it was not something
22 that we were asked to do or did.

23 Q And specifically, if you look at both the charge
24 and the abbreviated statement of task in both Exhibit 3 and
25 4, is it a fair statement that this committee that you were

1 chair of was not asked specifically to determine whether or
2 not the exposure was associated with the harms to a level
3 of at least as likely as not?

4 MR. BAIN: Object to form.

5 A Again, that was not part of the charge and not
6 something that we would have done.

7 Q Okay. In terms of the charge, were you asked to
8 assess the combination effects of the contaminants in the
9 water?

10 MR. BAIN: Object to form.

11 A No, I mean I think that in evaluating, as we
12 described, the results of evaluating TCE and PCE and
13 solvents, we were looking at the literature and what that
14 could tell us about each of those chemicals. It was not
15 part of the charge and it was not something in the report
16 to talk about, you know, chemical mixtures or what would be
17 expected from multiple chemicals. As might have been -- as
18 would have been involved in the Camp Lejeune exposure, the
19 literature evidence was on a chemical by chemical basis.
20 That's what we described.

21 Q So when you looked at the charge, I will show you
22 again, the charge and the abbreviated task, statement of
23 task, is it a fair statement that your directive from the
24 National Academy of Science was not to determine whether or
25 not there was a combined effect as a result of these

1 multiple contaminants in the water?

2 A That was not part of the statement of task, no.

3 Q Okay. The -- I don't know if this has been stated
4 as of yet, but the report that was authored in 2009 was
5 based on epidemiological information that ended in 2008; is
6 that correct?

7 A That's correct.

8 Q Okay. Somewhat of a silly question, but has
9 science stood still for the last 15 years?

10 A No, it has not.

11 Q So as it pertains to health effects that have been
12 revealed over the course of the last 15 years, this report
13 has no follow-up that would inform either the government or
14 the public about those health effects that have been shown
15 to exist over the past 15 years, correct?

16 MR. BAIN: Object to form.

17 A The -- that's correct, the evidence today is a
18 cumulation of -- if you go back to the 2003 report, it's
19 updated in 2008, and obviously there would be a lot
20 updating to do if one were to take on the same mission in
21 2024, that's, you know, 16 years of research that would
22 be -- that would have been added to the mix, and these
23 remain areas of active research, TCE and PCE.

24 Q The -- the limitations on the charge, do you know
25 who specifically actually formulated the charge?

1 A I do not. This is something that is provided to
2 us having presumably been worked out between the sponsor
3 and the NRC staff.

4 Q Do you know why it was that you weren't asked to
5 specifically look at benzine and vinyl chloride?

6 A I do not. I mean there was an emphasis -- I think
7 there was some mention of other chemicals in the water, but
8 the clear focus was on TCE and PCE.

9 Q And at the time your study was published, the
10 ATSDR had only done its work on Tarawa Terrace which was
11 largely a PCE contaminated site?

12 A The only work that had been completed was the
13 reproductive health studies, which it had some information
14 on Hadnot Point, but it was incomplete. In fact, there
15 were some inaccuracies as it turned out in the assignment,
16 but that was all that had been completed. The modeling and
17 exposure assessment, there was a great deal of emphasis on
18 the Tarawa Terrace with more work to be done at the time on
19 Hadnot Point.

20 Q When you say there were some inaccuracies in the
21 assignment, what do you mean?

22 A This is where, again, it's in the report, but
23 there was a section of the base that was thought to not
24 have been exposed to contaminated water that was later
25 found to have intermittently received water from one of the

1 contaminated sources, and so even in the simple
2 classification of exposed, unexposed, there was I know a
3 recommendation to redo the report that had been completed
4 with correcting for that -- that erroneous assignment.

5 Q In terms of the process that you utilized in
6 reviewing the literature, am I correct in my understanding
7 that it would have been Ms. Martel that would have pooled
8 together the literature from 2003 to 2008?

9 MR. BAIN: Object to form.

10 A I am -- I'm assuming that the staff would have
11 helped in doing, you know, computerized literature searches
12 and they have really excellent resources and help within
13 the academy for identifying literature. They do this all
14 the time. And so I don't recall in detail, but maybe I'm
15 generalizing from other committees that they would have
16 taken the lead in identifying all the subsequent
17 epidemiologic and toxicologic research on the chemicals of
18 interest in the intervening years. It may have been -- you
19 know, if individual committee members found new things, we
20 would have certainly thrown those in the mix if other
21 things came up, but typically the formal search is done by
22 the staff of the NRC.

23 Q Ms. Martel and her --

24 A Right, on behalf of her. It may have been her,
25 but it's also possibly the information technology experts

1 that are employed at NRC.

2 Q So you would have started with the Institute of
3 Medicine study from 2003 --

4 A Yes.

5 Q -- as kind of the foundation and then utilized Ms.
6 Martel to -- and her staff to build upon that to pull the
7 research both epidemiological and toxicological together to
8 fill in the gap from 2003 to 2008?

9 A I believe that it would have -- that it was done
10 that way and we were provided with the references and then
11 we as the committee reviewed and interpreted those studies.

12 Q And whether or not Ms. Martel did an exhaustive
13 search and pulled everything together that existed as it
14 related to the diseases of consideration, we have to ask
15 her whether or not that was the case or not, correct?

16 A Again, I don't think it's in there, the sort of
17 exact method that was used to identify the literature. I
18 think at that time, there was less emphasis on the exact
19 algorithm, the search words, the databases, but the goal
20 was to identify all relevant studies that had occurred --
21 that had come out since 2003.

22 Q But from the epidemiological standpoint, the
23 search words and the algorithms would have been formulated
24 from Ms. Martel and her staff?

25 A Right, through NRC rather than the committee

1 itself.

2 Q I had asked you about the contract between the
3 Navy and the National Academy of Science. Did you say you
4 have seen that contract or you have not seen it?

5 A I have never seen that before.

6 Q So you don't know how much the Navy paid the
7 National Academy of Science for this research?

8 A No, no.

9 Q Do you know why there was only one water modeler
10 selected to the NRC panel?

11 A I do not.

12 Q And as to whether or not any of the -- strike
13 that.

14 I think you were asked about the peer reviewers
15 at one time, that there's a -- part of the process is that
16 when the draft is completed, then that goes to some peer
17 reviewers?

18 A That's correct, yes.

19 Q And how those peer reviewers are selected, you
20 don't have input into that?

21 A Other than, again, we sometimes are asked to
22 suggest individuals we know who we think may be of value
23 and we will offer that advice. The presumption is that Dr.
24 Martel is soliciting advice from lots of people -- it's not
25 like we have don't have any ideas anyway -- and we are

1 unaware of who they are, who is selected, who the comments
2 came from, that's -- that's done completely blindly.

3 Q There was a statement in the report about the
4 scope and the role of the peer reviewers and I'm going to
5 paraphrase it. I don't remember it exactly, but is it a
6 fair statement that the peer reviewers were not asked to
7 agree or disagree with the conclusions that you made, but
8 just offer commentary?

9 A That's right, I mean they can offer whatever
10 comments they want, but I think the main point there is
11 that after we have received those comments and taken it
12 into account in revising the report, we do not go back and
13 ask them if they are satisfied now. In other words, they
14 offer their input, we are -- we make use of that to improve
15 the report. We are not obligated to make -- you know,
16 there is not -- there is not a formal sort of obligation,
17 it's not that they ultimately are going to approve or
18 disapprove it. They have offered their expert opinion and
19 that's what we receive and that ends their involvement.

20 Q You were asked specifically about the lack of
21 inclusion of immune effects related to TCE and or PCE. Did
22 you speak with any immunologists at all about the impact
23 that TCE and or PCE has on the immune system?

24 A There was a mention in the -- I think it was in
25 the preface about hearing from an expert at the National

1 Institute of Occupational Safety and Health, Mike Luster,
2 who is an immunotoxicologist. I don't remember the details
3 of that. It was only in the preface that we I believe
4 mention -- thank him for his input, but I don't recall any
5 other details beyond that in terms of immune effects.

6 Q Were there any members of the panel who resigned
7 at any point in time?

8 MR. JOHNSON: Objection.

9 A Again, I had to read the preface to refresh my
10 memory that there was someone -- I don't even know that --
11 this individual may have resigned before even the first
12 committee meeting, they may have agreed and then withdrawn,
13 but there was mention of an individual who had been engaged
14 and then chose to withdraw.

15 Q And as to the circumstances and the timing of that
16 resignation, you are just not absolutely clear on that?

17 A I had not honestly remembered until I looked at
18 the preface again. The involvement had ended so early or
19 been so minimal that at least in terms of my memory of it,
20 I don't recall -- you know, I don't -- I didn't recall her
21 being involved or leaving.

22 Q There's a statement -- and I may not be able to
23 find it -- put my hand on it right now, but I can when we
24 come back later and that is there was a note thanking Ms.
25 Martel for helping to work through many controversies that

1 existed during the course of your -- your review of Camp
2 Lejeune. Do you remember what those many controversies
3 were?

4 MR. JOHNSON: Objection.

5 A Again, this is where I honestly don't recall
6 any -- at this point in time, any specific comments. I
7 mean obviously if I did recall this individual said that,
8 that's really -- that's deliberation that goes on, you
9 know, with confidentiality, but there are always points of
10 contention. That's the part of the process by which the
11 committee reaches a consensus is people express their
12 impressions and divergent interpretations, these are all
13 independent experts, and we come around to a common point
14 of view, which I think that's why it works as well as it
15 does. And, you know, it's the nature -- all the committees
16 are like that. They are dealing with something that's not
17 so straightforward. If it was, they wouldn't need a
18 committee. So I wouldn't put undue weight on that as being
19 this was somehow uniquely -- I don't know -- contentious or
20 problematic.

21 Q I wasn't suggesting that. I'm not looking for
22 anything that would be confidential in the deliberative
23 process, but, for instance, at page 131, there's a mention
24 and a footnote related to Leanne Sheppard's dissent.

25 A Right.

1 Q Is that part of the controversies you were
2 speaking about?

3 MR. JOHNSON: Objection.

4 A That's the only one that was not ironed out to
5 reach -- in other words, the rest of the report reflects in
6 varying ways the controversies that arose and were brought
7 to some happy agreeable resolution. That was one that was
8 indicated in the footnote there that did not reach that
9 resolution and so Dr. Sheppard chose to express her
10 misgivings about the way a particular issue was handled.

11 Q We will speak more directly about that later on.

12 I think you had mentioned this, that it's not
13 uncommon for folks on a panel even among the epi --
14 epidemiologists to not necessarily agree on all the finer
15 points of a particular study?

16 MR. JOHNSON: Objection.

17 A I think that there's a general sense in which we
18 make our independent assessments, we may all read the same
19 paper, we may get together and talk about it, put different
20 degrees of emphasis on one issue or another and come around
21 to finding some common ground. It may be that, you know,
22 on the one hand, on the other hand, but it's often more on
23 the subtleties. It's not that there are these like
24 diametrically opposed views, at least from my experience,
25 they are more often nuances of interpretation where we

1 might differ.

2 Q And I guess what I'm driving at is whether it's
3 epidemiology or toxicology, what we are dealing with is a
4 science that is not absolutely a precise or exact science,
5 correct?

6 A Right, well, by the nature of both the science
7 itself, but also the nature of this particular body of
8 research, there are a lot of unresolved issues. That's how
9 we end up with the categories we end up with. The
10 literature is not -- you know, it's not -- you know, one of
11 these issues where it's been studied so well and so
12 definitely that there is complete disclosure. That is a
13 situation where there are going to be different judgments
14 about how strong it is because it's in the range of, well,
15 you know, suggestive -- there's a range there, but it's in
16 a controversial range I guess inherently.

17 Q I want to ask you a bit about a document,
18 Exhibit 6. It's got a date on it of October 7, 2008.

19 A 6, okay, yes.

20 Q Do you see that?

21 A Yes.

22 Q I think you were asked a number of questions about
23 this. This document would have been generated after you
24 had come up with your draft, right?

25 A No, this was -- I believe this was --

1 Q The top corner says October 7, 2008, so I just
2 don't know when --

3 A Yeah, that's not the date -- this would have --
4 oh, that would have been the first committee meeting
5 presumably. I have to look at the calendar again and see
6 when -- I thought we met in 2007 though. That's what's a
7 little strange. I'm not sure of the dates, but my
8 recollection is that this was the -- yeah, that this was
9 part of the clarification of the charge to the committee
10 and I'm just not sure on the timing of that.

11 Q If this date is accurate, then it couldn't be part
12 of the charge?

13 MR. BAIN: There is also a date on the first --

14 THE WITNESS: Oh, there, that helps.

15 Q I'm not sure what the --

16 A Somebody transcribed it or whatever, but no,
17 that's correct.

18 Q Okay. No, that's okay. So who would have
19 presented this to you?

20 A This is the Marine General whose name I'm not
21 recalling, but it's in the preface.

22 Q And was this the General that you had talked about
23 before as being more vocal in terms of bringing this to a
24 close?

25 A In presenting, you know, the motivation behind

1 this. I mean it's pretty explicit in there, but, you know,
2 the desired outcome, it was basically tell us what to do in
3 the broadest sense. There was much more than that to it of
4 course and it was -- but it was also -- in the discussion,
5 it was clear they were looking for scientific guidance that
6 would help to bring this, again, long-standing controversy
7 to some sort of resolution and closure.

8 Q So in terms of when the charge would have been
9 given, would it have been given to you before September 24,
10 2007?

11 A I think -- again, this is maybe more what's
12 typical, but I think that I was shown the charge when I was
13 invited to be the chair of the committee.

14 Q Which was in July, right?

15 A Again, I don't have the details of when that
16 occurred. That sounds about right though. And then I
17 think other committee members may well have been recruited
18 by -- when they say what am I signing onto, there has to be
19 some way to describe what this committee is going to do,
20 and I believe it would have been by looking at the
21 charge -- by sharing the charge with the potential
22 committee members.

23 Q And how many times did this committee actually
24 meet? And I'm not talking about in a public meeting, but
25 meet --

1 A I believe three times.

2 Q Okay.

3 A Some of that may involve public time, you know,
4 open session and some may have -- I think at least the
5 first two involved both open and closed sessions.

6 Q Okay.

7 A I guess the other one -- I don't know if you
8 consider it a meeting -- is when we were releasing the
9 report and providing a description of the report itself, I
10 didn't consider that a meeting, that was a subset of us
11 went to Camp Lejeune to present the report.

12 Q And you mentioned you were on other NRC panels.
13 Is three kind of a typical number, have you met more than
14 that at times?

15 A That's a pretty short one. That's a time limited
16 one. It depends on the scope of the work and what's being
17 asked of us, but I've been on some that more like six or
18 seven or eight over a period of three years or something.
19 This was relatively time compressed and relatively few
20 meetings.

21 Q And was that time compression driven by the
22 sponsor, in other words, they wanted this done rather
23 quickly?

24 MR. BAIN: Object to form.

25 A Again, this is part of what goes on behind the

1 scenes with the NRC and the sponsor, they are presumably
2 addressing the nature of the question, the budget, a
3 realistic timeline for getting the work done, sort of
4 shaping it and scoping it out, so that by the time I get
5 involved, it's been -- it's been sort of refined, you know,
6 to take all those things into account.

7 Q Okay. I'm going to show you this document and
8 then we will wrap up for today. You were asked about
9 Mr. Ensminger's -- Master Sergeant Ensminger's power point
10 that's also dated September 24, 2007. Do you recall being
11 asked about that?

12 A I do. I'm not sure if I'm able to find it right
13 now. Oh, there it is, I did, I found it.

14 Q And I think Mr. Bain kind of pointed you to the
15 second box on the first page that says the Marine Corps
16 knew for years that the drinking water was heavily
17 contaminated. Do you know when the drinking wells at
18 Hadnot Point and Tarawa Terrace were actually turned off?

19 MR. BAIN: Object to the form.

20 A What I recall, the general statement is when the
21 contamination was identified in 1985, they -- I don't
22 remember if that was specific to one source or another, but
23 that was when the exposure was identified and ended. I
24 would have to look in the report or some other source for
25 more detail than that.

1 Q Well, if you look at -- I will direct you to pages
2 two and three of Mr. Ensminger's power point. Does it
3 appear there that if you look at the boxes from Jennings
4 Laboratory, the U.S. Army Environmental Hygiene Team, on
5 pages two and three, that there is knowledge of
6 contamination beginning in 1980?

7 MR. BAIN: Object to form and foundation.

8 A Again, that's what he reported. I have no idea
9 where that came from. It's not something that -- again, I
10 don't have the expertise really to interpret that.

11 Q If that is true though, that the U.S. Army knew
12 about the contamination in 1981, then simple math would say
13 that it took four years to turn the wells off?

14 MR. BAIN: Object to form and foundation.

15 A Again, I don't -- if the -- right, if the
16 contamination was discovered at time one and they shut it
17 off at time two, again, as I said, there's a lot of -- that
18 would obviously be the timeline, the interval between those
19 two events.

20 Q So to the extent that there was any suggestion
21 that what is on Box 2 of page one, Exhibit 7, is either
22 false or inaccurate, that would be true if it took four
23 years to turn -- turn off these wells, correct?

24 MR. BAIN: Object to form and foundation.

25 A Right, I have -- right, I have no idea if it is

1 true, but this is again -- well, it's outside the scope of
2 my expertise, but it's -- if that were the case, that would
3 be the time interval and that would be -- you know,
4 lending -- again, I'm trying to be careful here because I
5 have no basis for showing that this is incorrect, but I
6 also have no direct evidence or knowledge that it is
7 correct.

8 Q Understood.

9 MR. TELAN: Why don't we -- since I have a few
10 hours of questions related to the NRC report itself and
11 since we have been here now almost eight hours, we will
12 reconvene at a later point and that will give us time to
13 get the -- I think the order from our court on the NRC
14 attorneys being here. And I believe we are still waiting
15 on the NRC response to the subpoena, so that will give us
16 time to get that done too.

17 THE WITNESS: Okay.

18 THE VIDEOGRAPHER: This concludes today's
19 testimony of David Savitz. We are going off the record at
20 4:41.

21 (End of video record.)

22 THE REPORTER: So on the stenographic record, can
23 you place your orders?

24 MR. BAIN: Don't we have a standing order?

25 MR. TELAN: I thought we did.

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MS. GREENWALD: Are you with Golkow?

EXHIBIT TECHNICIAN: Yes.

MS. GREENWALD: Okay. We definitely have a standing order.

MR. JOHNSON: I doubt we have a standing order, but we would like a copy.

(Time noted: 4:42 P.M.)

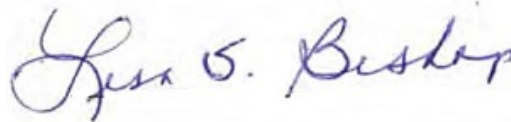
C E R T I F I C A T E

I, Lisa S. Bishop, RPR, RMR, a Notary Public in and for the State of Maine, hereby certify that the within-named deponent was sworn to testify the truth, the whole truth, and nothing but the truth, in the aforementioned cause of action.

I further certify that this deposition was stenographically reported by me and later reduced to print through Computer-Aided Transcription, and the foregoing is a full and true record of the testimony given by the deponent.

I further certify that I am a disinterested person in the event or outcome of the above-named cause of action.

IN WITNESS WHEREOF, I subscribe my hand this 25th day of June, 2024.



Lisa S. Bishop

Notary Public

My Commission Expires: January 27, 2030

DEPONENT SIGNATURE PAGE

CAPTION: Camp Lejeune Water Litigation v. USA

DEPONENT: David A. Savitz, Ph.D.

I _____, acknowledge that I have read pages ____ through ____ inclusive of the transcript of my deposition taken on June 10, 2024.

I further acknowledge that:

(check appropriate language)

_____ the same is a true, correct, and complete transcription of the answers given by me to the questions recorded therein. OR

_____ except for the changes noted on the attached errata sheet, the same is a true, correct, and complete transcription of the answers given by me to the questions recorded therein.

Deponent

Subscribed and sworn to before me

this ____ day of _____, 2024.

Notary Public _____

1 ERRATA SHEET FOR THE TRANSCRIPT OF:

2 David A. Savitz, Ph.D. - 6/10/24

3 Corrections:

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate.

The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

DISCLAIMER: THE FOREGOING FEDERAL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS

COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

Veritext Legal Solutions is committed to maintaining the confidentiality of client and witness information, in accordance with the regulations promulgated under the Health Insurance Portability and Accountability Act (HIPAA), as amended with respect to protected health information and the Gramm-Leach-Bliley Act, as amended, with respect to Personally Identifiable Information (PII). Physical transcripts and exhibits are managed under strict facility and personnel access controls. Electronic files of documents are stored in encrypted form and are transmitted in an encrypted

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