

Exhibit 158

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NORTH CAROLINA

IN RE:) Case No.:
CAMP LEJEUNE WATER) 7:23-cv-00897
LITIGATION)
)
This Document Relates to:)
ALL CASES)

The video-recorded and videoconferenced deposition of BENJAMIN WALTER HATTEN, M.D., M.P.H., taken pursuant to the Federal Rules of Civil Procedure of the United States District Courts pertaining to the taking of depositions, reported by Pauline Vargo, Certified Shorthand Reporter, Registered Professional Reporter and Certified Realtime Reporter, at Suite 100, 26 West Dry Creek Circle, Littleton, Colorado, on May 12, 2025, commencing at 9:02 a.m. Mountain Time.

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I N D E X

Monday, May 12, 2025

WITNESS

EXAMINATION

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National Academies Consensus Study Report,
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(2023)

1 THE VIDEOGRAPHER: Good morning.
2 We are now on the record. My name is Julie
3 Butcher. I am a videographer for Golkow
4 Litigation Services.

5 Today's date is Monday, May 12th,
6 2025, and the time on the record is 9:02 a.m.
7 Mountain Time.

8 This video deposition is being held
9 in Littleton, Colorado, in the matter of Camp
10 Lejeune Water Litigation, No. 723-cv-897,
11 versus the United States of America, being
12 heard before the United States District Court
13 of the Eastern District of North Carolina.

14 The deponent is Benjamin Hatten, M.D.
15 Counsel's appearances will be noted
16 on the stenographic record.

17 Our court reporter is Pauline
18 Vargo, and she will now swear in the witness.

19 THE REPORTER: Would you raise your
20 right hand to be sworn, please.

21 (The witness was duly sworn.)

22 BENJAMIN WALTER HATTEN, M.D., M.P.H.,
23 called as a witness herein, having been first duly
24 sworn, was examined and testified as follows:
25

EXAMINATION

BY MS. SILVERSTEIN:

Q. Hi, Dr. Hatten. I know we've met a few minutes ago, but my name is Kailey Silverstein. I'm here with my colleague, Haroon Anwar. We represent the United States in the Camp Lejeune litigation.

Could you please state your full name for the record.

A. It's Benjamin Walter Hatten.

Q. And what is your current address?

A. My office address or...

Q. Your office address is fine.

A. 26 West Dry Creek Circle, Suite 815, Littleton, Colorado, 80120.

Q. And that's the location of Toxicology Associates?

A. Correct.

Q. Do you understand that this deposition is proceeding -- is a court proceeding even though we are not in a courtroom?

A. Yes.

Q. And do you understand that you are under oath?

A. Yes.

1 Q. And by being under oath, do you
2 understand that that means you are obligated to
3 tell the truth?

4 A. Yes.

5 Q. And you have been deposed before, right?

6 A. Yes.

7 Q. I'm going to go over kind of a couple
8 what I call rules of the road. I'm sure they are
9 familiar to you, but I just want to make sure we
10 are on the same page.

11 We have a lovely court reporter here
12 taking down everything that we say, so it's
13 important that you answer the questions that I ask
14 verbally. So that means no nodding your head or
15 going "uh-huh." That's hard to get accurately on
16 the record. Does that make sense?

17 A. Yes.

18 Q. It's also important that you and I both
19 talk at a reasonable pace. I know sometimes I tend
20 to talk really fast, and that can be hard to get
21 down on the record. Does that make sense?

22 A. Yes.

23 Q. And you and I should also try our best
24 not to interrupt each other. There may be times
25 where you know exactly what question I'm about to

1 ask, and you are probably right, but I ask that you
2 let me finish asking the question first, and I will
3 do my best to not accidentally interrupt any of
4 your answers. Does that make sense?

5 A. Yes.

6 Q. Once the deposition is complete, you
7 will have the opportunity to read a transcript of
8 it, and you can make any corrections to the
9 transcripts in an errata, and then you will be
10 asked to sign the transcript. Does that make
11 sense?

12 A. Yes.

13 Q. During this deposition if I ask a
14 question and you don't understand what I'm asking,
15 it's a bad question, it's confusing, whatever, I
16 will ask that you please let me know and I can
17 clarify what I'm asking. If you answer the
18 question, I'm going to assume that you
19 understood -- you understood it. Does that make
20 sense?

21 A. Yes.

22 Q. During the deposition you may hear your
23 attorney say "objection" and object to something
24 about the question that I asked. Unless he
25 instructs you not to answer the question, please

1 answer the question after the objection has been
2 made. Does that make sense?

3 A. Yes.

4 Q. Is there any reason why you are not able
5 to give your most truthful and accurate testimony
6 today?

7 A. No.

8 Q. Is there any reason your memory might be
9 impaired today?

10 A. No.

11 Q. During this deposition you can ask for a
12 break at any time. I try to take breaks every
13 hour-ish, but if you need a break before that,
14 please let me know. I will ask that you answer
15 whatever question is pending if I've already asked
16 one, but we can take a break at any time that you
17 need. Does that make sense?

18 A. Yes.

19 Q. I'm handing you what I will mark as
20 Exhibit 1. This is the Notice of Deposition and
21 Subpoena for your deposition today.

22 (Exhibit 1 was marked for
23 identification and is attached to
24 the transcript.)

25 BY MS. SILVERSTEIN:

1 Q. Have you seen this document before?

2 A. Yes, an electronic version.

3 Q. Did you review the request for
4 production of documents that is listed as
5 Attachment A on the last page?

6 A. Yes.

7 Q. And I know that we received invoices
8 from you pursuant to Number 4. This attachment
9 also asks for certain letters or other
10 correspondence with a bunch of individuals that are
11 listed here. Do you have any correspondence with
12 any of these individuals?

13 A. No, not with any individual listed here.

14 Q. And do you have any correspondence with
15 any individual who has filed a claim related to the
16 Camp Lejeune Justice Act?

17 A. Not that I'm aware of, but I don't have
18 personal knowledge of anyone who has filed a claim.

19 Q. Sure, sure. But nothing that you are
20 aware of?

21 A. Correct.

22 Q. You can go ahead and set that aside.
23 What did you do to prepare for your
24 deposition today?

25 A. I reread my reports, some of the studies

1 that I reviewed in forming my opinions, and I
2 reviewed deposition transcripts of some of the
3 experts that have been taken in this case.

4 Q. You mentioned you reviewed your reports.
5 Are you referring to the bladder cancer report and
6 the kidney cancer report?

7 A. Yes, the general causation report for
8 bladder and kidney cancer that I produced I think
9 in December of 2024.

10 Q. And I think you said you also reviewed
11 some of the studies you relied on. Do you recall
12 which studies you reviewed?

13 A. It was a number of studies. I don't
14 have a comprehensive list off the top of my head,
15 so...

16 Q. Are there any studies that you reviewed
17 that you can recall right now?

18 A. Yeah, a number of studies.

19 Q. And what are those studies?

20 A. I reviewed the Bove, two Bove studies
21 from 2014; the ATSDR 2018; the two Bove studies
22 from 2024; and then a number of individual studies
23 that are included in my report. Like I said, I
24 don't have a comprehensive list of all the studies
25 I reviewed.

1 Q. Okay. Did you review any studies that
2 you hadn't previously reviewed for your report?

3 A. Yes. There were a couple studies that I
4 didn't reference in my report, but I reviewed prior
5 to the deposition particularly LeMasters 2008;
6 Goodman 2018; and there is a preprint of Yu 2025
7 that I reviewed.

8 Q. I'm handing you a supplemental materials
9 considered list, and we will mark the supplemental
10 materials considered list as Exhibit 2.

11 THE REPORTER: Do you want me to mark
12 them as we go along?

13 MS. SILVERSTEIN: Yes. Thank you.

14 (Exhibit 2 was marked for
15 identification and is attached to
16 the transcript.)

17 BY MS. SILVERSTEIN:

18 Q. This materials considered list I will
19 represent was produced to us on May 6th, 2025. It
20 lists two studies by Julie Goodman from 2018 and a
21 LeMasters study from 2006. Are those studies that
22 you reviewed while preparing for your deposition
23 that you hadn't previously reviewed?

24 A. Yes. I believe I misstated the
25 LeMasters article. I said 2008, but it was 2006,

1 at least based on this.

2 Q. But this is the same article?

3 A. Yeah, this is the same article. I just
4 don't recall if this publication date is correct or
5 -- or what, but...

6 Q. Okay. That's fine.

7 How did you become aware of these three
8 studies?

9 A. I think in conversation with the
10 attorneys and after reviewing Dr. Goodman's
11 deposition I pulled a couple articles that were
12 relevant.

13 Q. Were you aware of any of these three
14 studies when you finalized your kidney cancer or
15 bladder cancer general causation report in December
16 of 2024?

17 A. I don't recall if I was aware of them or
18 not. I think I included all studies that I used to
19 formulate my opinion and developing that, but I
20 don't recall if I was aware of these at that time
21 or not.

22 Q. Did reviewing these three studies change
23 any of your opinions in your kidney cancer or
24 bladder cancer general causation reports?

25 A. No. Just to clarify, and then I will

1 answer your question, these are just two studies.
2 The second entry is just the supplemental materials
3 to the Goodman 2018 article, so these are two
4 studies. This didn't change my opinions that I
5 expressed in the report.

6 Like, I said there, is also a preprint
7 study I reviewed that has not been published in the
8 peer-reviewed literature yet. It also did not
9 change my opinions.

10 Q. I am handing you what we will mark as
11 Exhibit 3 through the court reporter.

12 (Exhibit 3 was marked for
13 identification and is attached to
14 the transcript.)

15 BY MS. SILVERSTEIN:

16 Q. I handed you and marked as Exhibit 3
17 what is titled Dr. Benjamin Hatten Additional
18 Materials Considered, and I will represent that
19 this was provided to us on April 24th, 2025.

20 The study here is you, and it says
21 published online April 2025. Is that the preprint
22 study you are referred to?

23 A. Correct. I haven't seen a final
24 version; I've only seen the preprint version.

25 Q. It says at the top in brackets "kidney

1 cancer." Does that mean that your review of the
2 study was just for your kidney cancer causation
3 report?

4 A. No. I reviewed it for both kidney and
5 bladder.

6 Q. Okay. So it should be -- it should say
7 both kidney and bladder at the top?

8 A. I presume so, but --

9 Q. Okay.

10 A. -- I'm just letting you know I reviewed
11 it both for kidney and bladder.

12 Q. Okay, and I appreciate the clarification.
13 Did reviewing the Yu study change your
14 opinions in either the kidney cancer report or
15 bladder cancer report for general causation?

16 A. I think it helped me strengthen the
17 opinions with respect to benzene in both reports.

18 Q. I'm handing you what we will mark as
19 Exhibit 4.

20 (Exhibit 4 was marked for
21 identification and is attached to
22 the transcript.)

23 BY MS. SILVERSTEIN:

24 Q. I handed you what's marked as Exhibit 4.
25 It says "Dr. Benjamin Hatten, Second Supplemental

1 Materials Considered List," and it lists the
2 transcripts of four individuals. I will represent
3 that this was produced to us on May 8th, 2025.

4 When did you review these transcripts?

5 A. I don't recall the exact dates. In
6 early May, but I don't recall the exact date.

7 Q. Okay. So sometime in the last two-ish
8 weeks, roughly.

9 A. Sometime.

10 Q. And why did you review these four
11 transcripts?

12 A. I think I reviewed them because these
13 were other experts that were being deposed in this
14 litigation to try and get a sense of potential
15 questions that might be asked in my deposition, if
16 there were similarities.

17 Q. Did your review of any these four
18 transcripts change your opinions in any way for
19 your kidney cancer or bladder cancer general
20 causation reports?

21 A. No.

22 Q. Did you meet with anybody to prepare for
23 your deposition today?

24 A. I met with some attorneys from the team
25 I had been working with to -- during deposition

1 preparation.

2 Q. Do you remember who you met with?

3 A. I met with Ted, who is here today, and
4 Zach Mandell.

5 Q. Was there anybody else present at any of
6 these meetings?

7 A. At least one meeting, I think, Patrick
8 Wallace, who is another attorney on the team, was
9 also at one of -- one of the meetings.

10 Q. Aside from Ted and Zach Mandell and
11 Patrick Wallace was anybody present?

12 A. Not that I recall. They were done
13 virtually, so I can't -- but I don't recall anybody
14 else on the Zoom sessions.

15 Q. Okay. You said they were done
16 virtually. Is that true for all of the meetings?

17 A. For deposition preparation?

18 Q. Yes.

19 A. Yes.

20 Q. And how many times did you meet with the
21 attorneys for deposition preparation?

22 A. It was a few times. I don't recall the
23 exact number.

24 Q. Do you remember if it was, like, more or
25 less than five times?

1 A. Roughly five, but I don't recall the
2 exact number.

3 Q. Okay. And about how long were these
4 calls?

5 A. I think they varied from 30 minutes to a
6 couple hours.

7 Q. And you have testified as a
8 deposition -- in deposition before, correct?

9 A. Correct.

10 Q. About how many times have you had your
11 deposition taken?

12 A. I don't know the exact number. I would
13 have to estimate, if that's something you would
14 like me to do.

15 Q. Could you estimate? And I will make
16 sure to note that it is not a precise number.

17 A. I would estimate somewhere between 10
18 and 20 times, so something in the teens, but I
19 don't know exactly how many.

20 Q. Okay. Have all those depositions been
21 related to expert work?

22 A. Yes. I can't recall a deposition that
23 was not related to expert work.

24 Q. You don't recall any depositions that
25 were related to you in your personal capacity?

1 A. I've never had a deposition taken in a
2 personal capacity. I was just trying to recall
3 whether I have ever been deposed as a fact witness,
4 as a treating physician or something like that. I
5 think all of the depositions have always been as an
6 expert witness.

7 Q. Okay. Have any of those depositions
8 been related to TCE or PCE?

9 A. Not that I recall.

10 Q. Were any of those depositions related to
11 benzene?

12 A. Not that I recall.

13 Q. Were any of those depositions related to
14 vinyl chloride?

15 A. Not that I recall.

16 Q. Have you ever testified in trial -- at
17 trial?

18 A. Yes.

19 Q. How many times?

20 A. Again, I don't have an exact number, and
21 I would have to estimate.

22 Q. Do you recall if it is more or less than
23 ten times?

24 A. I would estimate it's similar to the
25 number of deposition times, so roughly 10, maybe a

1 little more, maybe a little less.

2 Q. Okay. When were you first retained for
3 the Camp Lejeune litigation?

4 A. I don't recall the exact date that --
5 when I was retained.

6 Q. Do you recall if it was in 2024?

7 A. I don't recall with certainty, although
8 I believe it was prior to 2024, but I don't recall
9 an exact date, so...

10 Q. Do you recall who retained you?

11 A. I was originally contacted by Pat Telan
12 from Bell. I don't know what the full name of the
13 firm is, but it's Bell Legal Group or Bell Law
14 Firm, something like that.

15 Q. What were you asked to do?

16 A. Are you speaking about when he
17 originally asked me?

18 Q. When you were first retained, what were
19 you asked to do?

20 MR. RUZICKA: Objection. Prior to him
21 being retained or after him being retained?

22 MS. SILVERSTEIN: I'm asking about the
23 scope of what was asked of him.

24 BY THE WITNESS:

25 A. My -- if I recall correctly, and again,

1 this was at least a year ago and probably more than
2 that, I was initially asked to review the
3 literature surrounding Camp Lejeune water exposures
4 and possible health effects in a general sense and
5 to provide some insight as a toxicologist as to
6 what that body of literature showed.

7 Q. Was the scope of your work, were you
8 only asked to look at the toxicology related to
9 kidney cancer and bladder cancer?

10 MR. RUZICKA: Objection to the extent
11 that you are asking about communications
12 between counsel and a retained expert. He
13 gave you the scope of what he was asked to
14 review. You are now going into what specific
15 communications we have had since then.

16 BY MS. SILVERSTEIN:

17 Q. Did you at any point look into
18 literature related to TCE, PCE, benzene or vinyl
19 chloride on any disease other than kidney or
20 bladder cancer?

21 A. I've reviewed some of that literature.
22 I wasn't -- however, I was not asked to form an
23 opinion on those and have not formed an opinion on
24 any outcomes other than kidney and bladder cancer.

25 Q. Were you -- did you do research into any

1 chemicals other than TCE, PCE, benzene and vinyl
2 chloride?

3 A. I may have read some articles on other
4 compounds, but the focus of my literature search
5 was on those four compounds.

6 Q. I'm handing you what we have marked as
7 Exhibit 5.

8 (Exhibit 5 was marked for
9 identification and is attached to
10 the transcript.)

11 BY MS. SILVERSTEIN:

12 Q. I handed you a series of invoices on the
13 bottom marked as CL_PLG-expert_Hatten_000000001
14 through 26, and these are invoices billed to Bell
15 Legal Group for the matter Camp Lejeune. Have you
16 seen these invoices before?

17 A. I believe I have seen them. I typically
18 don't review the finished invoice that my assistant
19 sends out. I sent a list of billing entries, and
20 she produces these to send to the attorney firms,
21 but I believe I've looked at these before.

22 Q. Okay. On the first page ending with the
23 Bates number 01, the first day on that page is
24 November 5th, 2023. Does that sound like it would
25 be around when you started working on the Camp

1 Lejeune litigation?

2 A. That sounds like a -- like it is
3 probably appropriate. I wouldn't have -- I don't
4 think I would have done work on this prior to
5 billing for it, though. That's not a typical
6 practice, so I presume this is the first date.

7 Q. Okay. And to the best of your
8 recollection, you didn't start working on the Camp
9 Lejeune litigation several months before that,
10 right?

11 A. Not that I recall.

12 Q. Okay. If you'd turn to the page ending
13 in Bates stamp 023. Are you on the page ending
14 023?

15 A. Yes.

16 Q. The last date there is listed as
17 February 27th, 2025. There are no invoices for
18 March or April 2025. Did you do any work on the
19 Camp Lejeune litigation in March or April of 2025?

20 A. Yes.

21 Q. And have you billed for that work that
22 you did yet?

23 A. I don't recall if I did any work in
24 March. I know I have some billings from April.
25 I just don't know if they have gone out yet to the

1 attorney firms.

2 MS. SILVERSTEIN: We will note that we
3 are requesting the remaining invoices since
4 February 2025.

5 MR. RUZICKA: That's fine., and just
6 for the record, Exhibit 5 contains Bates label
7 Hatten 24 and 25, which we emailed about which
8 were inadvertent production.

9 MS. SILVERSTEIN: Yep.

10 BY MS. SILVERSTEIN:

11 Q. Do you have Exhibit 1 next to you still?

12 A. Yes.

13 Q. Actually, you can go ahead and put that
14 aside. Do you know who Nicklaus Brandehoff is?

15 A. He is one of the -- my colleagues in
16 Toxicology Associates that's listed at the top of
17 the billing sheets here.

18 Q. And did you work with him at all on the
19 Camp Lejeune litigation?

20 A. No.

21 Q. Did you work with anybody other than
22 Nicklaus Brandehoff on the Camp Lejeune litigation?

23 MR. RUZICKA: Object to form.

24 A. I didn't work with Nicklaus Brandehoff
25 on this litigation.

1 Q. Sure. Did you work with anybody else in
2 preparing the reports?

3 A. I had conversations with the attorneys
4 who retained me, but outside of that, no.

5 Q. So you didn't have a research assistant
6 or a secretary help you with any of your work?

7 A. No. I do my own literature search and
8 write my own reports.

9 Q. Okay. I am handing you what we will
10 mark as Exhibit 6.

11 (Exhibit 6 was marked for
12 identification and is attached to
13 the transcript.)

14 BY MS. SILVERSTEIN:

15 Q. I have handed you Exhibit 6 which is
16 titled Camp Lejeune: Kidney Cancer Expert Report of
17 Benjamin Hatten, M.D., M.P.H. Is this the
18 report that you prepared for this -- one of the
19 reports that you prepared for this litigation?

20 A. Yes, it appears to be.

21 Q. It is dated December 8, 2024. Do you
22 see that date?

23 A. Yes.

24 Q. And below the date, is that your
25 signature?

1 A. Yes.

2 Q. If you could turn to Appendix II of this
3 report, which is labeled as Dr. Hatten's CV.

4 A. Yes, I have it.

5 Q. Is this your current CV?

6 A. I believe so. I typically update my CV
7 about twice a year, so it's probably due for an
8 update soon, but I think this is the most recent
9 version available.

10 Q. Is there -- you said it is due for an
11 update soon. What would need to be updated on the
12 CV?

13 A. I presume any publications that have
14 come out since the last -- last time I updated
15 this. And, yeah, I don't think there have been any
16 new presentations since then, so it would just be
17 if there were any publications that have occurred
18 since the last time I updated it.

19 Q. If you turn to page 11 of this CV. At
20 the top of page 11 it says Publications/Work
21 Products. Do you see that?

22 A. Yes.

23 Q. Are there any publications that you have
24 had that are not listed here?

25 A. I suspect so. I'm on a number of

1 guideline writing committees, and we produce
2 publications fairly regularly. I believe there
3 have been at least, at a minimum, one; likely a
4 handful of publications that have occurred since
5 December.

6 Q. We will request an updated list of
7 Dr. Hatten's publications.

8 Aside from the publications that we were
9 just discussing, is there anything else that you
10 can think of that is missing from your CV?

11 A. Not as I sit here.

12 Q. Is your CV a complete representation of
13 your educational and professional background?

14 A. It's a sketch of my educational and
15 professional background. I don't think you can
16 ever represent somebody's full background on a set
17 of paper, but it lists I think programs that are
18 completed, publications, talks that I have given
19 and positions I've held.

20 Q. Is there anything that you made the
21 decision to not include on your CV?

22 A. No. It's comprehensive as far as I'm
23 aware.

24 Q. So when you say a sketch, you just mean
25 it is a piece of paper and not actually a picture,

1 not actually your real life; would that be fair to
2 say?

3 MR. RUZICKA: Objection, form.

4 A. Correct. I also think something like
5 listing that I have completed a medical toxicology
6 fellowship doesn't really give an explanation for
7 all the training and knowledge and expertise that
8 goes into that, so...

9 Q. Okay. So would it be fair to say that
10 it lists all of the programs or certifications you
11 have, but it doesn't list all of the coursework or
12 practice that went into obtaining those
13 certifications?

14 A. Correct, in the sense that it is just a
15 list, so...

16 Q. Dr. Hatten, have you published any
17 original research on kidney cancer and PCE, TCE,
18 vinyl chloride or benzene?

19 A. I don't believe I've published any
20 papers that where the primary objective is focused
21 on that. I have done a -- participated in research
22 projects that involved large databases that may
23 have touched upon those either exposures or
24 outcomes, but none where that is the primary
25 hypothesis being or primary exposure-outcome

1 relationship that's being evaluated.

2 Q. Do you recall any projects that you can
3 think of right now that may have included the
4 exposure-outcome relationship of kidney cancer and
5 either PCE, TCE, vinyl chloride or benzene?

6 A. Not that I can recall right now.

7 Q. Have you published any original research
8 on bladder cancer and PCE, TCE, vinyl chloride or
9 benzene?

10 A. I think that would be the same answer,
11 where it may have been a component of a project
12 I've worked on, but it was not the primary
13 exposure-outcome relationship being evaluated.

14 Q. Okay. Can you recall sitting here now
15 any projects where -- that included the
16 exposure-outcome relationship of bladder cancer and
17 PCE, TCE, vinyl chloride or benzene?

18 A. Not -- I can't recall anything while I'm
19 sitting here.

20 Q. Okay. And, Dr. Hatten, you are a
21 medical toxicologist and emergency medicine
22 physician, right?

23 A. Those are the medical specialties that I
24 am -- have been trained in and am board-certified
25 in.

1 Q. Would it be accurate to say that you are
2 a toxicologist?

3 A. Yes. A medical toxicologist is a
4 physician who has completed a medical toxicology
5 fellowship and has specific training in toxicology
6 as it relates to human health.

7 Q. Do you consider yourself an
8 epidemiologist?

9 A. Yes. I have a master's in public health
10 in epidemiology and biostatistics.

11 Q. Since receiving your master's in public
12 health, how much of your time has been spent
13 working on epidemiology or epidemiology-related
14 projects?

15 A. Could you clarify the question? Are you
16 asking, like, what percentage of my time or what
17 roles I've had or...

18 Q. About what percentage of your time has
19 been spent working on epidemiology as compared to
20 toxicology or emergency medicine?

21 A. It's a little difficult to completely
22 stratify that because most of the research I do is
23 epidemiology or epidemiologic research oriented
24 with a toxicologic focus, like those are the kind
25 of problems I look at, are toxicology problems in

1 general. And I also teach principles of
2 epidemiology and causation to our fellowship
3 program, like I am the faculty member who teaches
4 that in the medical toxicology program.

5 I'm a site director for occupational
6 environmental health programs at the University of
7 Colorado, and so I'm involved in other specialties
8 where epidemiology is a large role and -- or is a
9 focus. And I, like I said before, I sit on a
10 number of guideline writing committees, and those
11 involve evaluating the evidence using epidemiologic
12 principles.

13 So I don't know that I could give you a
14 specific breakdown of how -- what proportion of my
15 time is spent doing strictly epidemiology because
16 it crosses over into other aspects of my job.

17 Q. Okay. Fair enough.

18 Do you consider yourself an exposure
19 scientist?

20 A. I use principles of exposure science as
21 they pertain to toxicology. However, I don't
22 typically do my own modeling or anything for
23 exposure assessments.

24 Q. Okay.

25 A. So in some aspects, yes, but not as a

1 stand-alone exposure scientist.

2 Q. Okay. Do you consider yourself a risk
3 assessor?

4 A. That answer is similar in the sense that
5 I discuss risk and risk evaluation in the context
6 of primarily toxicology. However, I typically
7 don't produce, like, isolated reports on risk
8 assessment and I'm not typically engaged to do a
9 risk assessment as an -- as an isolated topic.
10 It's only in the context of patient care or in
11 evaluating the literature on another product -- or
12 another problem.

13 Q. If you turn to page 7 of your CV, it
14 lists -- it says service and then organizations.
15 Is this a complete list of the organizations that
16 you are a member of?

17 A. To the best of my knowledge, I believe
18 it is.

19 Q. Okay. And so I want to go back to the
20 body of the kidney cancer report, which is Exhibit
21 6. This is the report on -- for general causation
22 that you wrote about kidney cancer for this case,
23 right?

24 A. Correct.

25 Q. Are there any changes that you need or

1 want to make to your opinions as they relate to
2 kidney cancer?

3 A. No.

4 Q. Does this report contain all of the
5 opinions on kidney cancer that you intend to offer
6 in the Camp Lejeune litigation?

7 A. Yes, with respect to general causation.
8 I guess I reserve the right to provide specific
9 opinions if that happens at a later date.

10 Q. Okay. But you haven't provided any
11 specific opinions related to kidney cancer at this
12 time, correct?

13 A. Not at this time.

14 Q. And sitting here right now, there aren't
15 any opinions that you have formulated that you have
16 not offered in a written report?

17 MR. RUZICKA: Object to form.

18 A. I currently don't have any additional
19 opinions on kidney cancer that I formulated or
20 prepared to offer.

21 (Exhibit 7 was marked for
22 identification and is attached to
23 the transcript.)

24 BY MS. SILVERSTEIN:

25 Q. I am handing you Exhibit 7. This is the

1 bladder cancer report on general causation that you
2 prepared for this case, right?

3 A. Yes, it appears to be.

4 Q. And I understand that you also authored
5 reports on bladder cancer for specific causation.
6 So during the course of today's deposition, all of
7 my questions related to bladder cancer will pertain
8 to your general causation report. Does that make
9 sense?

10 A. Yes.

11 Q. And this report is dated December 9th,
12 2024. Do you see that?

13 A. Yes.

14 Q. And below that date, is that your
15 signature?

16 A. Yes.

17 Q. Are there any changes you need or want
18 to make to your opinions on bladder cancer as they
19 relate to general causation?

20 A. Not with respect to general causation.

21 Q. And does this report contain all of the
22 opinions on bladder cancer you intend to offer in
23 this case for general causation?

24 A. Yes.

25 Q. Are all of the opinions that you intend

1 to offer in this case as they relate to general
2 causation contained in either your kidney cancer
3 report or your bladder cancer report?

4 A. At the current time, based on my review
5 of the literature.

6 Q. And do you have -- so I guess to be
7 clear, you are not offering any opinions on
8 leukemia, correct?

9 A. Not at this time.

10 Q. And you are not offering any opinions on
11 non-Hodgkin's lymphoma, right?

12 A. Not at this time.

13 Q. And you are not offering any opinions on
14 Parkinson's, right?

15 A. Not at this time.

16 Q. And you said that you performed a
17 literature search when preparing your opinions,
18 right?

19 A. Yes.

20 Q. Would it be fair to say that when
21 analyzing the epidemiology and toxicology on the
22 exposure-outcome relationship, a literature search
23 is a key step.

24 MR. RUZICKA: Objection, form.

25 A. Yes. I think performing a literature

1 search is a key step in identifying the body of
2 evidence that surrounds a specific exposure-outcome
3 relationship.

4 Q. And a literature search should be
5 crafted to produce both positive results and
6 negative results for the exposure-outcome
7 relationship, correct?

8 A. Yes. Ideally you are not doing the
9 search with the outcomes of the studies in mind.
10 It's only with respect to the exposure and outcome
11 relationship.

12 Q. And that's to make sure that you are
13 getting a balanced understanding of the literature?

14 A. I don't know if it's necessarily
15 balanced, but it's to have a comprehensive review
16 of the literature so you know the full body of
17 science surrounding the question.

18 Q. And would it be right to say that that's
19 to make sure you are not missing any relevant
20 studies in that search?

21 MR. RUZICKA: Objection, form.

22 A. I think that is part of it. Part of it
23 is also -- part of it is also to ensure that you
24 have -- you understand the entire breadth of the
25 body of literature. So it's not as if two

1 scientists will perform the exact same search and
2 find the exact same number of articles, but the
3 scope for a well-crafted literature search should
4 be similar.

5 Q. Where did you perform your search? And
6 by that I mean, like, what search, what databases
7 did you use?

8 A. I typically use PubMed and Google
9 Scholar as my primary search instruments. I
10 believe I primarily used PubMed for this search,
11 although I don't -- and I think it's listed in my
12 report, although I don't recall without reviewing
13 the report.

14 Q. Do you recall what your search criteria
15 was?

16 A. If we are talking about bladder cancer,
17 if you looked on -- if you look on page 10, I list
18 the search terms.

19 Q. And the search terms for kidney cancer
20 are likewise listed on page 10 of the kidney cancer
21 report, right?

22 A. I don't know if the page numbers are the
23 same. I would have to review.

24 Yes, it appears to be page 10 on my
25 kidney cancer report as well.

1 Q. Did anybody provide you with any studies
2 for either your kidney cancer report or your
3 bladder cancer report?

4 A. No one -- there are some articles that I
5 requested, I identified and requested the full
6 manuscript, and I think I had my assistant pull
7 those from some source. I don't know where, where
8 she got the full text from, through some form of
9 interlibrary loan, but I identified all those
10 studies when I requested the manuscripts.

11 Q. Okay. So there weren't any studies that
12 were provided to you that you didn't request?

13 A. Not that I recall.

14 Q. There are a number of studies that are
15 listed in your materials considered list attached
16 to your report that are not discussed or cited in
17 the body of the report. How did you decide which
18 studies to rely on?

19 MR. RUZICKA: Which report?

20 MS. SILVERSTEIN: Both reports.

21 MR. RUZICKA: Object to form.

22 BY MS. SILVERSTEIN:

23 Q. Would it be fair to say that you
24 reviewed more studies than you cited and discussed
25 in the body of the report?

1 A. Yes. I reviewed more studies than are
2 explicitly cited in the body of the report.

3 Q. And how did you decide which studies to
4 discuss in the -- or cite in the body of the report
5 from the body of studies you reviewed?

6 A. I included studies that had an explicit
7 exposure of either Camp Lejeune or the compounds we
8 have been discussing, TCE, PCE, benzene and vinyl
9 chloride, or had a proxy exposure that -- exposure
10 definition that was clearly correlated to one of
11 those compounds and with an outcome of either
12 kidney cancer or bladder cancer respectively.

13 So there are a number of studies that
14 don't have clear exposure outcome relationships or
15 definitions that I reviewed but did not discuss in
16 the body of the report.

17 Q. In the study of epidemiology, an
18 association isn't the same thing as causation,
19 right?

20 MR. RUZICKA: Objection, form.

21 A. There is -- sometimes the term "causal
22 association" is used, which is -- implies that the
23 association is actually causal. An association is
24 a finding in a study or an evaluation of a
25 population that may or may not be causal if you are

1 using a generic term of association.

2 Q. And that's because while epidemiologists
3 use the term "association" to report quantifiable
4 findings when discussing a dataset derived from a
5 specific population, this term doesn't imply a
6 general association in the population at large or
7 provide direct evidence of causation; right?

8 MR. RUZICKA: Object to the form.

9 A. Sorry. I was -- I kind of lost what the
10 question was there. If you could rephrase or ask
11 again.

12 Q. Sure. If you turn to page 4 of the
13 kidney cancer report, do you see the heading for
14 causation?

15 A. Yes.

16 Q. And the second-to-last sentence of that
17 first paragraph says, "Of note, while
18 epidemiologists use the term 'association' to
19 report quantifiable findings when analyzing a
20 dataset derived from a specific population, this
21 term does not imply either a general association in
22 the population at large or provide direct evidence
23 of causation," correct?

24 A. You read that correctly, and I believe
25 I'm referring to the term "association" that's in

1 quotes in that sentence.

2 Q. Okay. And, Dr. Hatten, would it be fair
3 to say that this statement in your report is a
4 statement you agree with?

5 A. I wrote this statement, and I've already
6 said that this expresses my opinion, so I don't
7 have a reason to change that.

8 Q. And you wouldn't typically draw a
9 conclusion about causation from a single study,
10 right?

11 A. I think it would depend on the specific
12 circumstances, although in general most times a
13 single study is -- it is difficult to find
14 causation with only a single study if that's the
15 only body of evidence that's evaluated.

16 Q. You would want to see if the results of
17 that study are replicated in other studies before
18 determining whether there is causation, right?

19 A. In general, yes. As I said, we would
20 have to talk about a specific example if there was
21 a situation where somebody drew a or identified a
22 causal association based on a single study, but I
23 don't know that that's the case in anything in my
24 reports.

25 Q. Epidemiology studies often use relative

1 risk to indicate the level of association observed
2 in a study, right?

3 MR. RUZICKA: Objection, form.

4 A. Relative risk is one measure of
5 association that is used in epidemiologic studies.
6 It is not the only one. It depends on how you
7 design the study as to what your measure of
8 association -- what reported measure of association
9 you would use for that study.

10 Q. A relative risk of 1.0 or lower
11 generally indicates no association, right?

12 MR. RUZICKA: Objection, form. Go
13 ahead.

14 A. It generally indicates no association in
15 the population study, as studied in that report.

16 Q. At what level of relative risk do you
17 consider there to be evidence of an association?

18 A. I don't think or I'm not aware of a
19 specific cutoff for a single number. They all
20 report what the association is in the data that was
21 analyzed in that study, so it's not as if there is
22 a single number you can point to and say greater or
23 less than this is an association. Even a number
24 less than 1 is still a reported association in the
25 study. It is just a negative association.

1 Q. Sure. Maybe I should reframe that.

2 When you are analyzing studies to
3 determine whether or not a positive association
4 exists, what relative risk do you generally look
5 for?

6 A. I don't have a specific number that I
7 look for, and I'm not aware of any consensus or
8 scientific consensus on what a specific number that
9 represents a positive association is other than the
10 factual report of greater than 1 is positive, less
11 than 1 is negative when you are discussing a
12 measure such as relative risk.

13 Q. Are you familiar with Dr. David Savitz?

14 A. I'm familiar based on some questions
15 that were in the deposition transcripts related
16 to -- related to his publications.

17 Q. Before reviewing those transcripts, were
18 you familiar with Dr. David Savitz?

19 A. Not personally. I don't recall whether
20 I've reviewed any of his work or not in the past.

21 MS. SILVERSTEIN: Okay. We have been
22 going for about an hour. I think now would be
23 a good time to take a five- to ten-minute
24 break.

25 MR. RUZICKA: If you would like to.

1 I'm fine.

2 THE WITNESS: I can keep going.

3 MS. SILVERSTEIN: I would like to take
4 a short five- to ten-minute break.

5 THE VIDEOGRAPHER: The time is
6 10:00 a.m. We are now off the record.

7 (Recess taken.)

8 THE VIDEOGRAPHER: The time is 10:08
9 a.m. We are back on the record.

10 BY MS. SILVERSTEIN:

11 Q. Dr. Hatten, one way to analyze -- do you
12 consider it important to analyze the precision of a
13 study's risk estimate?

14 A. I think it's informative to review the
15 precision of a study's risk estimate.

16 Q. Would it be fair to say that the wider
17 -- or I guess one of the ways that you can analyze
18 the precision of a risk estimate is by looking at
19 the study's -- the study results' confidence
20 intervals?

21 A. That's one way to eval- -- or to -- the
22 precision is reported or one aspect of precision
23 that's reported frequently in studies, and I just
24 want to make clear when you are using "precision,"
25 you are using the statistical term "precision," not

1 a lay term, correct? So a statistical term
2 "precision" is how closely grouped a particular set
3 of results are.

4 Q. And do you agree that the wider the
5 confidence interval, the less confidence in the
6 point estimate?

7 MR. RUZICKA: Objection, form.

8 A. No, that's not the case. The point
9 estimate that is reported is the actual measured
10 value that the investigator found. The confidence
11 interval may describe something different than how
12 confident the investigator is in the point estimate
13 they found.

14 Q. I am handing you Exhibit 8.

15 (Exhibit 8 was marked for
16 identification and is attached to
17 the transcript.)

18 BY MS. SILVERSTEIN:

19 Q. I handed you, if you look on the first
20 page, it says Reference Manual on Scientific
21 Evidence: Third Edition (2011). Do you see that?

22 A. Yes.

23 Q. And in the top left-hand corner it says
24 National Academies, Sciences, Engineering and
25 Medicine. Do you see that?

1 A. Yes.

2 Q. And are you familiar with the National
3 Academies of Sciences, Engineering and Medicine?

4 A. Yes, in a general sense that I'm aware
5 of what it is.

6 Q. And in a general sense you would agree
7 that the national Academies of Sciences,
8 Engineering and Medicine is a reputable body,
9 right?

10 MR. RUZICKA: Objection, form.

11 A. I think you always have to evaluate a
12 individual work product based on what its -- based
13 on its own merits. However, in general, this is
14 considered a reputable scientific body.

15 Q. If you turn to page 621. Are you on
16 page 621?

17 A. Yes.

18 Q. Do you see the -- one, two, three --
19 fourth definition down, it has confidence interval?

20 A. Yes.

21 Q. And about, it looks like, two sentences
22 in there is a sentence that starts with "the
23 width." Do you see that?

24 A. Yes.

25 Q. It says, "The width of the confidential

1 interval provides an indication of the precision of
2 the point estimate of relative risk found in the
3 study; the narrower the confidential interval, the
4 greater the confidence in relative risk estimate
5 found in the study. Where the confidence interval
6 contains a relative risk of 1.0, the results of the
7 study are not statistically significant."

8 Do you agree with that statement?

9 A. The -- there are multiple statements
10 here, so could you ask me specifically about what
11 you are asking me to agree with?

12 Q. Sure. The first part says, the width of
13 the confidence interval provides an indication of
14 the precision of the point estimate or relative
15 risk found in the study. Do you agree with that
16 statement?

17 A. I agree that this provides an indication
18 of the precision of the point estimate or relative
19 risk found in the study.

20 Q. So you do agree with that statement?

21 A. I think I just answered. I read the
22 part I agree with.

23 Q. Is there a part of that statement that
24 you don't agree with?

25 A. No.

1 Q. Okay. It next --

2 A. Not as I read it, so...

3 Q. It next says, "The narrower the
4 confidence interval, the greater the confidence in
5 the relative risk estimate found in the study." Do
6 you agree with that statement?

7 A. I am not sure how they are intending
8 that statement to come across, so I don't know if I
9 can agree with it or not.

10 Q. Is there a part of that statement that
11 you disagree with?

12 A. Again, I think I'm not sure how they are
13 intending that statement to come across, so I don't
14 know how -- whether I can agree with it or not.

15 Q. So you don't know whether you can agree
16 that the narrower the confidence interval, the
17 greater the confidence in the relative risk
18 estimate? You don't know if you can agree with
19 that statement?

20 A. I think I've answered this twice, and I
21 can answer again. I don't know what they are
22 intending here. I think there are multiple ways
23 you can read this study, and without having more
24 information, it would be difficult to answer that.

25 You are also showing me one -- this is,

1 I think, a thousand-page book or something like
2 that if you look at the whole book, so my guess is
3 there is a much larger section on confidence
4 intervals that is in this book that's beyond this
5 single or, like, definition entry that you are
6 pointing out; and I think we would have to review
7 that entire section to know what they are intending
8 or what can reasonably be believed is intended with
9 that statement.

10 Q. Okay. So generally speaking you --
11 would you agree that a narrower confidence interval
12 indicates a greater confidence in the relative risk
13 estimate than a wide confidence interval?

14 A. Could you explain what you mean by
15 confidence in a relative risk estimate?

16 Q. Would you agree that a narrower
17 confidence interval indicates that the relative
18 risk is more likely to be representative of the
19 population than a wide confidence interval?

20 A. I think it is more likely that you have
21 a -- that the true value in the population falls
22 within the range that's expressed by the confidence
23 interval. That doesn't necessarily mean that the
24 relative risk it expressed, you have more or less
25 confidence in that, the relative risk that's

1 expressed; it's just the relative risk that's
2 expressed.

3 Q. Would you agree that where relative risk
4 includes 1.0, that result is not statistically
5 significant?

6 A. Presuming a -- I would agree in a study
7 that utilizes a statistical test that produces --
8 where the study authors produce a 95% confidence
9 interval, when it includes one that is by
10 convention assuming the authors set their
11 methodology up that way, that is not considered
12 statistically significant.

13 Q. Another way that you can look at
14 statistical significance is by considering the
15 p value, right?

16 A. That is a way to evaluate statistical
17 significance.

18 Q. A p value of less than 0.05 is generally
19 considered to be statistically significant, right?

20 A. Again, if the study authors set up their
21 study and identify a p value of .05 as
22 statistically significant, then that is
23 statistically significant for that study. However,
24 there are a number of statistical methodologies
25 that can be employed that don't use a .05 p value

1 as statistical significance.

2 Q. What statistical methodologies are you
3 referring to?

4 A. Do you want an example or an exhaustive
5 list?

6 Q. Provide an example, please.

7 A. So, for example, something like a
8 Bonferroni correction is used. Oftentimes it's not
9 a .05. There are also studies where people will
10 use .01 or they will use .1. The authors typically
11 identify what they consider statistically
12 significant in a specific study, and it's dependent
13 on how the hypothesis that's being studied is --
14 what methods the authors think are most appropriate
15 in analyzing the exposure-outcome relationship if
16 we are talking about an epidemiologic study.

17 Q. So it sounds like you are saying that
18 generally speaking there is not an accepted p value
19 in the epidemiology community. Is that right?

20 MR. RUZICKA: Objection, form.

21 A. I don't think that's what I said.
22 I think I'm saying that it's dependent on the
23 methodology of the individual study and how you are
24 using statistical testing within the methodology of
25 the study. Historically, by convention, .05 was

1 used to indicate statistical significance, but
2 that's not a methodologic -- there is not a
3 methodologic rationale for using .05.

4 Q. If you could go ahead and turn back to
5 your kidney cancer report to page 7.

6 On page 7 you have the heading
7 "Exposures of Interest." Do you see that?

8 A. Yes.

9 Q. Right above that you have a two-sentence
10 paragraph. Do you see where I'm looking?

11 A. I see the section just above the heading
12 Exposures of Interest.

13 Q. And it says, "Of note, the ATSDR states
14 that we did not use confidence intervals to
15 determine whether a finding was statistically
16 significant, nor did we use significance testing to
17 assess the evidence of causality."

18 Do you see that?

19 A. Yes.

20 Q. In forming your opinion as it relates to
21 kidney cancer and bladder cancer on general
22 causation in the Camp Lejeune litigation, did you
23 consider confidence intervals when determining
24 whether a study was statistically significant?

25 A. As identified by the authors in each

1 individual study with respect to their study
2 methodology, I considered confidence intervals as
3 to whether that was statistically significant in
4 the study.

5 Q. And so did you make your determination
6 based on whether or not the authors said that their
7 results were statistically significant?

8 A. Are you asking if they used the term
9 "statistically significant"? Is that how I
10 identified it?

11 Q. No. Did you -- when you were
12 determining whether a study supported causality,
13 did you use the authors' parameters as set out in
14 their studies, or did you have your own criteria
15 for statistical significance?

16 MR. RUZICKA: Objection, form.

17 A. Could you clarify the question because I
18 think --

19 Q. Sure. I will go ahead and give you an
20 example. For example, hypothetically if in a study
21 an author said a confidence interval of 0.1 to 2.5
22 is what we would consider statistically
23 significant, did you rely on their determ- -- or is
24 what we call evidence of causality. Did you rely
25 on what they said the parameter would be, or did

1 you have your own criteria for determining when a
2 confidence interval was too wide to support
3 causation?

4 MR. RUZICKA: Objection, form.

5 A. I did not rely on the authors'
6 assessment of whether statistical significance as
7 expressed by a confidence interval in their study
8 was supportive or not supportive of causality, but
9 I'm not aware of authors that -- I can't recall
10 authors that made a statement to that effect saying
11 that based on this confidence interval it does or
12 does not support causality.

13 Q. So if there is no statement about -- in
14 the studies about whether the confidence interval
15 was narrow enough to support causality, how did you
16 determine when a confidence interval was too wide
17 to be considered in your analysis?

18 MR. RUZICKA: Objection, form.

19 A. I'm not aware that I restricted my
20 analysis to a specific confidence interval, if that
21 is the question you are asking. I'm just not sure
22 that I under- -- if I misunderstood the question.
23 If you could rephrase it. But I'm not aware of any
24 studies where I excluded them based on the width of
25 a confidence interval.

1 Q. Are you aware of any studies where you
2 excluded them based on the p value?

3 A. I'm not aware of any studies that
4 excluded based on a p value alone.

5 Q. Do you agree that statistical
6 significance is an important factor to consider?

7 A. I would agree that it is a factor to
8 consider in the context of evaluating a specific
9 study. Again, it's dependent on how the study
10 authors developed their methodology and how they
11 are testing a hypothesis as to how -- how
12 statistical significance is expressed at any -- at
13 any point in a study.

14 Q. Dr. Hatten, I am handing you Exhibit 9.
15 (Exhibit 9 was marked for
16 identification and is attached to
17 the transcript.)

18 BY MS. SILVERSTEIN:

19 Q. Dr. Hatten, you submitted a report in
20 the Zantac litigation; is that right?

21 A. Yes.

22 Q. And that was in 2022?

23 A. I don't recall the year, but this is
24 dated March 7th, 2022.

25 Q. Does that sound accurate as to when you

1 submitted your report in the Zantac litigation?

2 A. That -- that sounds accurate. And I
3 don't have a reason to doubt that this date is
4 correct.

5 Q. The first page of this document is
6 Exhibit 7. If you turn to the next page, it says
7 at the top, "United States District Court for the
8 Southern District of Florida." Do you see that?

9 A. Yes.

10 Q. And it says, "Rule 26 expert report of
11 Benjamin Hatten, M.D., M.P.H." Is that right?

12 A. Yes.

13 Q. And that means this is your report?

14 A. Yes.

15 Q. And --

16 A. I didn't produce this myself, so I'm
17 trusting that you have an accurate version of this.

18 Q. If you look below that on the signature
19 line, that's your signature, correct?

20 A. Correct.

21 Q. And this is your report, but if you flip
22 through it quickly, does it appear to be a complete
23 and accurate copy of your report in the Zantac
24 litigation?

25 A. As far as I am aware, this is complete

1 and accurate as of March 7, 2022.

2 Q. Did you change this report after
3 March 7, 2022?

4 A. I have -- not for this specific action.
5 However, there have been a number of additional
6 Zantac matters where I have submitted reports and
7 have updated aspects of my report since 2022.

8 Q. So as to the in Re Zantac Products
9 Liability Litigation, MDL No. 2924, this appears to
10 be a complete and accurate copy of your report,
11 right?

12 A. I believe so.

13 Q. If you go to page 5 -- excuse me,
14 sorry -- page 6, the first sentence says, "Along
15 with a robust analysis of bias, the possibility
16 that the association of interest occurred by chance
17 rather than truly representing the underlying
18 population must be considered. Proper
19 consideration typically takes the form of an
20 examination of the study methodology in concert
21 with the statistical significance testing to
22 examine this possibility."

23 Do you agree with that statement?

24 A. Yes. I wrote this statement.

25 Q. And it is a statement that you still

1 agree with today, correct?

2 A. Could you -- sorry. I may have missed
3 it. Which sentence did -- or how far down did you
4 -- were you reading?

5 Q. The first sentence says, "Along with a
6 robust analysis of bias, the possibility that the
7 association of interest occurred by chance rather
8 than truly representing the underlying population
9 must be considered."

10 Today do you still agree with that
11 statement?

12 A. Yes.

13 Q. The next sentence says, "Proper
14 consideration typically takes the form of an
15 examination of study methodology in concert with
16 statistical significance testing to examine this
17 possibility."

18 Sitting here today, do you agree with
19 that statement?

20 A. I agree with that statement, and I don't
21 think that's any different than what I've been --
22 we have been discussing so far.

23 Q. Directing you to page 7, in the second
24 full paragraph there -- one, two -- the third
25 sentence and beginning with "however," do you see

1 that?

2 A. Yes.

3 Q. It says, "However, when effect sizes are
4 consistently weak (e.g., relative risk of less than
5 2.0), the likelihood that measured confounders have
6 not been fully accounted for or that the
7 association (if one exists) is only causal in
8 specific subpopulations becomes more likely,
9 necessitating additional scrutiny of any general
10 causation claim."

11 Do you agree with that statement?

12 A. I agree that it -- yes, I agree with
13 that statement as written.

14 Q. Okay. You can go ahead and set that
15 aside. In your reports for bladder cancer and
16 kidney cancer, you evaluated whether there was a
17 causal association for the chemicals TCE, PCE,
18 vinyl chloride and benzene individually, right?

19 A. Yes, correct.

20 Q. You also included a section in both of
21 those reports discussing the Camp Lejeune water.
22 Is that right?

23 A. I would say the entire report discusses
24 the Camp Lejeune water in the sense that that's the
25 exposure of interest that prompted this evaluation.

1 Q. Directing you to page 12 of the kidney
2 cancer report, on page 12 of your kidney cancer
3 report you have a section header that says,
4 "Exposure: Camp Lejeune Water," right?

5 A. Yes, you read that correct.

6 Q. And if you turn to page 16 of your
7 kidney cancer report, you have a section that says,
8 "Exposure: TCE." Do you see that?

9 A. Yes.

10 Q. So would it be fair to say that you
11 conducted an analysis, including a Bradford Hill
12 analysis, for Camp Lejeune water as well as for
13 TCE, PCE, vinyl chloride and benzene?

14 A. My report is structured evaluating the
15 Camp Lejeune water as a direct exposure, and then
16 the compounds of concern that were contained in
17 that, I evaluated each of those individually, and
18 that's how I set up the report.

19 Q. In the section that says "Exposure:
20 Camp Lejeune Water," were you evaluating the --
21 were you evaluating the Camp Lejeune water as a
22 mixture of the substances identified?

23 A. I was evaluating the evidence that
24 examined Camp Lejeune water as the exposure at a
25 specific study. So it is whatever mixture of

1 compounds that was present or that was being
2 evaluated in the water system at Camp Lejeune is
3 what I was evaluating here.

4 Q. You offer an opinion that there is a
5 causal relationship between the Camp Lejeune water
6 and kidney or bladder cancer, correct?

7 A. Yes.

8 Q. For what years does that opinion apply?

9 A. I think I was --

10 MR. RUZICKA: Object to form.

11 A. I think I listed that in the...

12 Q. In other words, does that opinion that
13 there is a causal relationship between the Camp
14 Lejeune water and kidney or bladder cancer, does
15 that apply for the entire period of 1953 to 1985 --
16 1987? Excuse me.

17 MR. RUZICKA: Objection, form.

18 A. My opinion applies to any water consumed
19 at Camp Lejeune that was contaminated with these
20 compounds at a -- or that was contaminated with
21 PCE, TCE, benzene and/or vinyl chloride during that
22 period from 1953 to 1987. So does that answer your
23 question?

24 Q. You are familiar with ATSDR's Camp
25 Lejeune water model, right?

1 A. I've reviewed the documentation
2 surrounding that.

3 Q. And so then you are aware that the
4 levels of the individual contaminants are estimated
5 to vary over the time period 1953 to 1987, right?

6 A. Correct. My understanding is based on
7 the modeling it is the individual contaminants
8 varied when modeled through that time period.

9 Q. Does your opinion that the Camp Lejeune
10 water has a causal relationship with kidney cancer
11 or bladder cancer take into account the varying
12 levels of individual contaminants from 1953 to
13 1987?

14 A. Are you asking -- if I can clarify, are
15 you asking for a specific individual who was
16 exposed or in general as a general causation
17 evaluation does the variability play a role?

18 Q. Is it your opinion that the levels of
19 contaminants that are estimated to have been
20 present at Camp Lejeune from 1953 to 1987 are all
21 sufficient to cause -- sufficiently high enough to
22 cause either kidney cancer or bladder cancer?

23 MR. RUZICKA: I object. You are
24 bordering on the specific causation component
25 of his report. He identified levels that were

1 hazardous to human health generally in this
2 report, and you are kind of asking him to go a
3 step further in the specific models at
4 different times and years.

5 MS. SILVERSTEIN: I am not, but I will
6 ask that you limit your objections to form and
7 foundation pursuant to the deposition
8 protocol.

9 MR. RUZICKA: Well, I'm just --

10 MS. SILVERSTEIN: Dr. Hatten -- I will
11 rephrase my question, that's fine, but please
12 limit the speaking objection.

13 BY MS. SILVERSTEIN:

14 Q. Dr. Hatten, would you agree that the
15 dose makes the poison? Have you heard that
16 statement before?

17 A. I've heard that statement before.

18 Q. Is it a statement that you agree with?

19 A. In general. The degree of toxicity is,
20 for a toxic exposure, for a specific outcome often
21 or almost always is dependent on a dose that -- or
22 a amount or however you want to characterize the
23 exposure, the degree of exposure impacts the
24 outcome.

25 Q. So would you agree that the

1 concentration of TCE, for example, in the water,
2 matters in your determination as to whether TCE is
3 capable of causing kidney cancer or bladder cancer?

4 A. I would agree that evaluating the --
5 using the example you provided, evaluating the
6 degree of exposure, and if you're limiting
7 specifically to TCE, the degree of TCE exposure,
8 would impact the outcomes that are seen.

9 Again, this is -- for any specific
10 individual, though, there is -- an individualized
11 assessment would be necessary.

12 Q. And to be clear, I'm not asking about
13 specific individuals. Is it your opinion that any
14 amount of PCE is capable of causing kidney cancer
15 or bladder cancer? Is that your opinion?

16 A. I don't think that's a opinion that's
17 expressed in this report, and I don't hold that
18 opinion.

19 Q. Okay. And so then it would be fair to
20 say that the amount of PCE in the water plays a
21 role in determining whether that PCE is enough to
22 be hazardous to human health, right?

23 A. I would agree --

24 MR. RUZICKA: Objection, form. Go
25 ahead.

1 A. I would agree that the degree of
2 exposure plays a role in the expected outcome
3 following or the potential outcome following an
4 exposure.

5 Q. And when you say you were reviewing the
6 Camp Lejeune water, were you considering the
7 amounts of TCE, PCE, vinyl chloride and benzene in
8 the water at the same time as part of your
9 analysis, or were you looking at these as four
10 separate constituents?

11 MR. RUZICKA: Objection, form.

12 A. The section -- the way I organized my
13 report, the section on Camp Lejeune expresses the
14 or identifies the evidence that where either the
15 water system as a whole is evaluated, so sometimes
16 that is or I think most often it was identified as
17 a duration, so a time of exposure or as a
18 combination of compounds.

19 If that water system had a analysis or
20 if the analysis of the water system was analyzed by
21 an individual compound, I placed that in the
22 individual compound section when I was performing a
23 causation analysis.

24 Q. When you were looking at the Camp
25 Lejeune water as the Camp Lejeune water systems,

1 did you examine any -- whether any of the chemicals
2 compete with each other for the same metabolic
3 pathways?

4 A. Yes. That was part of my evaluation.

5 Q. And do you discuss that in your report?

6 A. I think I discuss how metabolism is
7 similar between TCE and PCE and it utilizes some of
8 the same enzymes -- enzymes.

9 Q. Did you discuss whether TCE competes
10 with vinyl chloride or benzene?

11 A. I don't recall discussing that.

12 Q. And you would agree that the exact
13 relationship between the interactions of TCE,
14 benzene, PCE and vinyl chloride isn't known,
15 correct?

16 MR. RUZICKA: Object to form.

17 A. I just don't want to misrepresent the
18 opinion I expressed in the report. However -- and
19 so if you will give me a second, I just want to
20 find the section in the report where I discuss
21 this.

22 Q. Dr. Hatten, you said a minute ago that
23 you don't think that you discussed whether TCE
24 competes with benzene or vinyl chloride for the
25 same metabolic pathways, correct?

1 A. I don't believe I discussed that in the
2 report.

3 Q. Okay. So you didn't discuss whether the
4 exact relationship between TCE and benzene or vinyl
5 chloride is known, correct?

6 MR. RUZICKA: Objection, form.

7 A. I believe -- so I state in -- there are
8 a few instances where I discuss how multiple
9 compounds are present and that the exact
10 relationship is not known. I don't recall if there
11 is additional discussion in the report of other
12 aspects of that, though.

13 Q. Dr. Hatten, did you review ATSDR's 2022
14 publication, the public health assessment for Camp
15 Lejeune drinking water?

16 A. Yes.

17 Q. I am handing you Exhibit 10.

18 (Exhibit 10 was marked for
19 identification and is attached to
20 the transcript.)

21 BY MS. SILVERSTEIN:

22 Q. This is the ATSDR's public health
23 assessment for Camp Lejeune, correct?

24 A. Yes, or it appears to be.

25 Q. And this is a document that you reviewed

1 when forming your opinions, right?

2 A. I reviewed the 2017 public health
3 assessment produced by ATSDR.

4 Q. And does this appear to be the same
5 document that you reviewed?

6 A. I believe it is.

7 Q. If you could turn to page 33, do you see
8 at the bottom of the page the heading "PCE-TCE
9 Interaction"?

10 A. Yes.

11 Q. So three sentences in it says, "TCE is
12 generally metabolized at a higher rate than PCE."
13 Do you see that?

14 A. I see where it states that.

15 Q. And do you agree with that statement?

16 A. I think based on metabolic studies
17 that's correct.

18 Q. And then it says, "As a result, TCE is
19 primarily eliminated from the body in the urine
20 whereas PCE is eliminated primarily by exhalation."
21 Do you see that?

22 A. I see -- I see where it states that.
23 They are describing the parent compound, the TCE or
24 PCE, like the compound themselves, the elimination
25 of the compound themselves.

1 Q. Right. And so you see the sentence that
2 I just read out loud, right?

3 A. Correct. I just answered that.

4 Q. So then it says, "Evidence in animal
5 studies suggest that PCE will inhibit the
6 metabolism of TCE." Is that right?

7 A. I see that sentence and the next
8 sentence that says, "However, that effect may only
9 occur at exposure doses that are much higher than
10 could have been experienced by individuals
11 contacting water from the Camp Lejeune systems."

12 Q. Okay. And then it says, "There does not
13 appear to be evidence of synergistic effects
14 resulting, i.e., greater than additive, resulting
15 from combined exposures to PCE and TCE." Do you
16 see that?

17 A. I see where that sentence is written.

18 Q. And do you agree with that sentence?

19 A. I agree in the sense that it says there
20 does not appear to be evidence. I don't think
21 there is evidence either way. Like, there is just
22 a lack of evidence to indicate or to be able to
23 determine whether the effects are synergistic or
24 additive.

25 Q. Then a couple sentences down it says,

1 "The results of the binary weight of evidence,"
2 parentheses, "BINWOE, analysis from the Interaction
3 Toxicological Profile, ATSDR 2004, shown in
4 Appendix D, shows that the effects of TCE and
5 PCE" -- or "TCE on PCE," excuse me, "are considered
6 to be additive and the effect of PCE on TCE
7 toxicity are additive for neurological effects and
8 slightly inhibitive" -- "inhibitory for effects on
9 the liver and kidney," parentheses, "likely due to
10 the effects on TCE metabolism."

11 Do you see that?

12 A. I see where you have read that sentence.

13 Q. And do you agree with that sentence?

14 A. I agree that they wrote this sentence
15 correctly based on the analysis. I don't think
16 this is discussing kidney cancer, though, if that
17 is the implication, so --

18 Q. Dr. Hatten, do you agree with the
19 sentence?

20 MR. RUZICKA: He was answering his
21 question. You can finish.

22 BY THE WITNESS:

23 A. Like I said, I agree that they are
24 representing their analysis correctly. However, I
25 don't believe that the outcome that's being

1 analyzed is kidney cancer. I don't think there is
2 information available to let -- to tell us how --
3 how that interaction or potential interaction has
4 a -- has been defined with respect to kidney cancer
5 an outcome.

6 BY MS. SILVERSTEIN:

7 Q. So that wouldn't be something that you
8 considered in your report?

9 A. What is the -- what are you asking
10 about? What is the something I considered?

11 Q. You said there is not evidence
12 discussing the interaction between PCE and TCE and
13 whether or not it is additive or inhibitory for
14 kidney cancer; is that right?

15 A. I'm not aware of a sufficient body of
16 evidence to determine whether it is additive or
17 synergistic or inhibitory for kidney cancer.

18 Q. So you didn't consider then whether the
19 relationship between PCE and TCE was additive,
20 synergistic or inhibitory in your analysis of the
21 Camp Lejeune water; is that correct?

22 A. I did consider it and do not believe
23 there is sufficient evidence for us to determine
24 based on what we know about the mechanisms of
25 kidney cancer development.

1 I don't -- I don't believe there is a
2 reasonable way to think it is inhibitory, and I
3 think that's in the public health assessment, they
4 say it is -- they are presuming it is additive
5 given there is a lack of information about
6 synergism to support a synergistic effect. I just
7 don't think there is enough information available
8 to make that determination.

9 Q. So in your analysis, would it be fair to
10 say that you didn't evaluate PCE and TCE as
11 additive or synergistic?

12 A. I don't entirely understand the question
13 you are asking, so if you can rephrase it.

14 Q. Sure. When you were looking at the Camp
15 Lejeune water, you didn't consider whether the
16 interactions between TCE, PCE, vinyl chloride or
17 benzene had a synergistic effect on each other,
18 correct?

19 A. I considered it in the sense that there
20 is -- there are multiple studies that evaluate the
21 Camp Lejeune water as a whole which contains a
22 combination of these compounds, and I evaluated the
23 literature surrounding the interaction between
24 these chemicals, but it was not sufficient to
25 provide an answer as to whether it is additive or

1 synergistic.

2 Q. You reviewed the literature and then
3 applied the Bradford Hill viewpoints, correct?

4 A. I reviewed the literature, and I
5 organized my discussion according to the aspects of
6 causation as expressed by Bradford Hill.

7 Q. Before applying the Bradford Hill
8 viewpoints, an association must be more than just
9 observed; it needs to be clear-cut, correct?

10 MR. RUZICKA: Objection, form.

11 A. As a epidemiologist and toxicologist,
12 I'm not sure what you mean by that question, so...

13 Q. Do you agree that an explicit
14 exposure-outcome relationship must be defined
15 before you do any analysis?

16 A. Yes. That is step 1 in any causation
17 analysis.

18 Q. Do you agree that the exposure
19 definition needs to involve distinguishing factors
20 beyond simply the name of the substance of
21 interest?

22 A. Yes. It -- yes. There -- it is ideal
23 to be as specific as possible with the exposure
24 definition.

25 Q. Defining the outcome of interest

1 requires sufficient detail with respect to the
2 organ, tissue or metabolic processes affected,
3 correct?

4 A. In general, yes. It is also true,
5 though, that in epidemiologic literature it is
6 frequent that investigators will define an outcome
7 differently, like there will be individual
8 definitions depending on how the study is
9 conducted; and it's a -- kind of in the judgment of
10 the person evaluating the literature as to whether
11 those can be pulled together in a causation
12 analysis or not.

13 Q. If you have distinct causal pathways,
14 would you describe each pathway as a separate
15 general causation question?

16 A. I think it depends on the specific
17 question you are analyzing and how distinct the
18 individual causal pathways are and how -- how they
19 might interact with each other, so I think it
20 depends on the individual analysis.

21 Q. If you could go to Exhibit 9 and turn to
22 page 4. Do you see the second full paragraph
23 there?

24 A. Yes.

25 Q. Beginning at the second sentence it

1 says, "In the context of medical toxicology, the
2 exposure definition needs to involve distinguishing
3 factors beyond simply the name of the substance of
4 interest, including but not limited to timing,
5 chronicity and route of exposure, dosing range and
6 chemical formulation in order to analyze proposed
7 causal associations."

8 Is that correct?

9 A. Correct. Those are all factors that
10 need to be considered when performing a causation
11 analysis.

12 Q. And then it says, "Likewise, defining
13 the outcome of interest requires sufficient detail
14 with respect to organ, tissue or metabolic
15 processes affected as well as whether the proposed
16 causal pathway is related to subpopulations or
17 occurs in all humans."

18 Is that correct?

19 A. Yes. Those are all aspects of defining
20 the outcome of interest that are important.

21 Q. One of the Bradford Hill viewpoints that
22 you considered is strength of association, right?

23 A. Yes.

24 Q. Strength of association refers to
25 whether the risk estimate is clinically meaningful

1 and plausible, right?

2 A. It refers to the measured effect size in
3 populations who have been exposed to the exposure
4 of interest with respect to the outcome of
5 interest.

6 Q. You would agree that the higher the
7 relative risk, the greater the likelihood the
8 relationship is causal, right?

9 A. I would say all else being equal in a
10 hypothetical situation where the only difference
11 was the strength of association that was found, it
12 is -- it adds weight to a causation discussion to
13 have a higher strength of association. However, in
14 the real world, it's almost never or essentially
15 never the case that all else is equal, so...

16 Q. But assuming all else is equal, you
17 would agree that a lower relative risk means that
18 it is less likely the relationship is causal,
19 right?

20 MR. RUZICKA: Objection, form.

21 A. If you are only discussing that specific
22 Bradford Hill point, which is strength of
23 association and not evaluating the other aspects of
24 causation, there is less -- the strength of a
25 association, a lower strength of -- measured effect

1 size is relatively less supportive. But again, the
2 causation discussion doesn't happen only looking at
3 one viewpoint or criteria, and it's never -- all
4 else is never equal in the real world.

5 Q. It's possible for a relative risk to be
6 elevated due to bias or other confounding factors,
7 correct?

8 A. It is possible for the magnitude of
9 effect to be elevated or lowered due to bias. Then
10 separately confounding is a separate factor to
11 consider, but either can affect the measurement of
12 association.

13 Q. Another Bradford Hill viewpoint is
14 consistency, right?

15 A. Yes.

16 Q. You would agree that it is important
17 that a study be replicated in different populations
18 and by different investigators before a causal
19 relationship is accepted, right?

20 A. As a general statement, that is correct.
21 Again, you are never evaluating the body of
22 evidence in isolation to only look at consistency;
23 and however, I think it provides much -- it
24 provides additional evidence of strength to have
25 consistent findings.

1 Q. It's important that different studies
2 that examine the same exposure-disease relationship
3 generally should yield similar results, right?

4 A. I don't think there is an expectation
5 that doing or examining the same exposure-response
6 evalu- -- relationship in different populations
7 with different designs would yield the same
8 results. However, I think you could have more
9 confidence in the findings if they are -- if they
10 are similar across -- that the finding -- that the
11 finding of an exposure-response relationship is
12 consistent. If it is consistent across multiple
13 populations and multiple investigators, you can
14 have more confidence that that applies to humans
15 generally and not a subpopulation.

16 Q. Exposure response is another Bradford
17 Hill viewpoint, right?

18 A. Yes. That's one of the aspects that's
19 considered in causation.

20 Q. And generally speaking, a dose-response
21 relationship means that the greater the exposure,
22 the greater the risk of the outcome, right?

23 A. Generally speaking, yes. There are
24 various ways to analyze that, but generally
25 speaking.

1 Q. And you would agree that, generally
2 speaking, higher exposures should increase the
3 incidence or severity of the disease, correct?

4 A. I would agree that that is the case in,
5 for example, laboratory studies. Unless there is a
6 ceiling effect or sometimes you will see this in
7 animals where if they get too much of a compound
8 they die from it or they have another process that
9 develops. That means you don't find the outcome at
10 high doses.

11 In the real world it is evaluating
12 people who have been exposed. There are other
13 factors that may lead to a dose-response assessment
14 not being strictly increasing at higher doses.

15 Q. One of the Bradford Hill viewpoints you
16 considered is biological plausibility, right?

17 A. Yes.

18 Q. And biological plausibility depends on
19 the existing knowledge about the mechanism by which
20 the disease develops, right?

21 A. As a very general statement, that's
22 correct. It is evaluating whether there is a
23 potential mechanism for the disease to occur.

24 Q. The Bradford Hill viewpoints consider
25 specificity, right?

1 A. Correct.

2 Q. Generally speaking, an association
3 exhibits specificity if the exposure is associated
4 with a single disease or type of diseases, right?

5 A. Yes, in the sense that specific subtypes
6 of disease or a specific -- if there is a unique
7 sort of outcome that is associated with a specific
8 exposure, that adds -- and there aren't competing
9 causes, that is -- add strength to a causation
10 discussion.

11 However, I think throughout the
12 literature on causation discussions the absence of
13 a specific exposure-response relationship or a
14 absence of specificity as traditionally defined is
15 not necessarily a argument against causation.

16 Q. The vast majority of agents do not cause
17 a wide variety of health effects, correct?

18 A. I think it's difficult without knowing
19 exactly what you mean by "vast majority" and "a
20 wide variety." So if you have a specific example,
21 then I might be able to answer it more clearly.

22 Q. You would agree that a study that finds
23 that a specific agent is associated with many
24 different diseases should be looked at skeptically,
25 right?

1 MR. RUZICKA: Object to form.

2 A. I think you should look at every study
3 skeptically in the sense that that's part of your
4 job as a scientist, is to critically evaluate the
5 literature. In general, finding multiple
6 associations may make -- lead one to look at the
7 findings critically. That doesn't necessarily mean
8 they are wrong or right. It just requires
9 evaluation.

10 Q. Did you weigh the Bradford Hill
11 considerations relative to each other?

12 A. Could you clarify the question?

13 Q. Were there some Bradford Hill
14 considerations that you gave more weight to than
15 others?

16 A. A discussion of causation employing a
17 Bradford Hill framework is a qualitative discussion
18 in the sense that you are evaluating it. It's not
19 as if like it's a checklist or a point system where
20 you add up a number of points and say yes, this is
21 causal or no, this is not.

22 In general in toxicology, consistency
23 and dose-response are oftentimes the first things
24 that we evaluate. That doesn't necessarily mean
25 that -- and when present a well worked-out

1 biologically plausible mechanism are important
2 factors that I would look at first, but those are
3 not -- it's not to imply that the other factors are
4 not important.

5 MS. SILVERSTEIN: Okay. I think I
6 would like to take a short break. We have
7 been going for over an hour.

8 THE VIDEOGRAPHER: The time is
9 11:13 a.m. We are off the record.

10 (Recess taken.)

11 THE VIDEOGRAPHER: The time is
12 11:22 a.m. We are back on the record.

13 BY MS. SILVERSTEIN:

14 Q. Dr. Hatten, did you discuss with anybody
15 the substance of your testimony during the break?

16 A. Not the substance, no.

17 Q. For your kidney cancer and bladder
18 cancer general causation reports, you reviewed two
19 Bove studies from 2014?

20 A. Correct.

21 Q. You reviewed two Bove studies from 2024,
22 correct?

23 A. Yes.

24 Q. And you reviewed an ATSDR study from
25 2018, right?

1 A. Correct, as Camp Lejeune -- as
2 evaluations of the Camp Lejeune or exposures,
3 direct evaluations of the Camp Lejeune water system
4 exposures.

5 Q. You also reviewed the National Research
6 Council's 2009 report, Contaminated Water Supplies
7 at Camp Lejeune: Assessing Potential Health
8 Effects, correct?

9 A. I believe I reviewed that. It should be
10 on my materials considered list, though.

11 Q. Do you consider the National Research
12 Council to be a reputable organization?

13 MR. RUZICKA: Objection, form.

14 A. In general they are well recognized as a
15 scientific body.

16 (Exhibit 11 was marked for
17 identification and is attached to
18 the transcript.)

19 BY MS. SILVERSTEIN:

20 Q. I am handing Dr. Hatten Exhibit 11.

21 It's a lot of exhibits.

22 And I'm handing you the chapter that I
23 will be asking about rather than the entire
24 document.

25 Dr. Hatten, this is the NRC report on

1 Camp Lejeune that you reviewed in forming your
2 opinions on general causation as it relates to
3 kidney cancer and bladder cancer, correct?

4 A. I reviewed this when I was formulating
5 the my opinions. I don't know how much it informed
6 my opinions.

7 Q. And if you would turn to page 12 of the
8 document. You are on page 12?

9 A. Yes, I'm on page 12.

10 Q. The last full paragraph at the bottom
11 starts with the sentence, "The available scientific
12 information does not provide a sufficient basis for
13 determining whether the population at Camp Lejeune
14 has in fact suffered adverse health effects as a
15 result of exposure to contaminants in the water
16 supplies."

17 Did I read that correctly?

18 A. I believe you read that correctly.

19 Q. If you turn to page 8, on page 8 there
20 is Box 2 that says the "Categorization of health
21 outcomes reviewed in relation to TCE, PCE or
22 solvent mixtures." Do you see where I'm looking?

23 A. I see where you are looking.

24 Q. And do you see "Limited/Suggestive
25 Evidence of Association." Do you see that heading?

1 A. Yes.

2 Q. NRC classified kidney cancer as having
3 limited/suggestive evidence of an association,
4 correct?

5 A. Are you asking if that's what written?
6 Is that correct?

7 Q. Is that how NRC classified kidney cancer
8 in this 2009 report?

9 A. That's what it states on page 8 of this
10 2009 report.

11 Q. And it states that NRC classified
12 bladder cancer as having limited/suggestive
13 evidence of an association as to PCE, correct?

14 A. That's what this -- that's what I
15 believe this is stating on page 8 in this report.

16 Q. You didn't discuss NRC's findings for
17 kidney cancer or bladder cancer in the Camp Lejeune
18 water section of your reports, did you?

19 A. I don't believe I discussed that and
20 wouldn't have had a reason to. This is not --
21 these aren't original studies that would provide
22 evidence for or against a causal relationship.

23 Q. Okay. So in other words, you didn't
24 consider NRC's findings as relevant to your
25 conclusions regarding Camp Lejeune water, correct?

1 MR. RUZICKA: Objection, form.

2 A. This publication may be relevant in the
3 sense of providing a picture of one body's
4 assessment of the scientific evidence as published
5 in 2009. However, that's not what I would use ever
6 for my basis of forming a causation opinion.

7 Q. You did consider conclusions from bodies
8 like IARC in informing your opinions today,
9 correct?

10 A. I reviewed those bodies, but the
11 determination of -- my causation determination is
12 based upon my evaluation of the literature.

13 Q. So your review of agency determinations
14 as discussed in your report, that wasn't a
15 contributor to your conclusions, right?

16 MR. RUZICKA: Objection, form.

17 A. Again, I think I described my
18 methodology in my report for determining causation.

19 The agency evaluations of the evidence
20 may be helpful in assessing or in evaluating what
21 other scientists' opinions are with respect to a
22 causal relationship, but they are not -- but my
23 evaluation of the evidence is independent of any of
24 those organizations.

25 Q. Okay. So I guess to be clear, you

1 didn't consider the NRC report in forming your
2 opinion about kidney cancer or bladder cancer,
3 that's correct?

4 MR. RUZICKA: Objection, form.

5 A. I reviewed it and considered it, but it
6 is not the -- it doesn't provide new evidence that
7 would or doesn't provide any original evidence
8 of -- with respect to causation.

9 Q. You can set that aside.

10 I am handing you Exhibit 12, I believe.

11 (Exhibit 12 was marked for
12 identification and is attached to
13 the transcript.)

14 BY MS. SILVERSTEIN:

15 Q. I handed you Exhibit 12, which is titled
16 Evaluation of mortality among marines and navy
17 personnel exposed to contaminated drinking water at
18 USMC base Camp Lejeune: a retrospective cohort
19 study. Do you see that?

20 A. I see this title. This is not the
21 complete publication. There are four supplemental
22 files.

23 Q. Sure. This is the body of the report,
24 correct?

25 MR. RUZICKA: Objection to form.

1 BY MS. SILVERSTEIN:

2 Q. This is the written report, correct?

3 A. This is an incomplete version of the
4 report.

5 Q. So earlier you said that -- we looked at
6 a materials considered list that you said you
7 looked at that listed a study by Goodman separately
8 from the supplemental materials from Goodman,
9 correct?

10 MR. RUZICKA: Objection, form.

11 A. I think, as I said before, that those
12 are part of the same study and I listed --

13 Q. Yeah. You listed the supplemental
14 materials separate, as a separate entry, correct?

15 A. I didn't generate the list that was sent
16 to you. I told the attorneys what I reviewed
17 and...

18 Q. Okay. So I will acknowledge this
19 doesn't include the supplemental materials. Does
20 this appear to be the full text of the body minus
21 the supplemental materials?

22 A. It appears to be the body of the -- or
23 it appears to be the report or the study in
24 incomplete form without the supplemental materials.

25 Q. So if you turn to page 48 of your report

1 on kidney cancer. Are you on page 48?

2 A. This, somehow it's not -- it got mixed
3 up somehow.

4 Yes, I'm on page 48.

5 Q. And this is part of your materials
6 considered list, correct?

7 A. Correct.

8 Q. And you list the Bove studies, right?

9 A. Correct.

10 Q. You don't list the supplemental
11 materials, do you?

12 A. They are part of the publication.

13 Q. So if they are part of the publication,
14 how come in Exhibit 2 you listed the supplemental
15 materials separately?

16 MR. RUZICKA: Objection, form.

17 A. I think I just told you, I didn't
18 generate that list of supplemental materials. I
19 told my attorneys what materials I had reviewed,
20 and they sent something to -- in response to the
21 notice of the deposition, but I didn't physically
22 write that. I would include supplemental materials
23 for any study as part of the study itself.

24 Q. Okay. Well, let's talk about the body
25 of this study in what I handed you as Exhibit 12.

1 MR. RUZICKA: Objection, form.

2 BY MS. SILVERSTEIN:

3 Q. This is Dr. Bove's 2014 study, correct?

4 MR. RUZICKA: Objection, form. Do you
5 have the supplemental materials?

6 MS. SILVERSTEIN: No, as they are not
7 listed in the materials considered list. It's
8 noted on the record that the supplemental
9 materials are not here, and I won't ask any
10 questions about supplemental materials.

11 BY THE WITNESS:

12 A. This is a 2014 study, the first author
13 of Bove.

14 BY MS. SILVERSTEIN:

15 Q. Are you aware that Bove testified in a
16 deposition that this study suffered from an
17 exposure misclassification issue?

18 A. I've reviewed Dr. Bove's deposition, I
19 believe. I don't recall the details of his
20 testimony. I would have to review it to be able to
21 explicitly --

22 Q. So sitting here today you aren't aware
23 of whether or not Dr. Bove said that this study had
24 a misclassification issue, correct?

25 MR. RUZICKA: Objection, form.

1 A. I don't think that's true. I think I
2 would prefer to review his deposition testimony and
3 see exactly how it was he phrased things.

4 Q. Did you consider whether there was a
5 misclassification issue when analyzing this study?

6 A. Yes.

7 Q. And did you believe that there was a
8 misclassification issue?

9 A. I think my understanding is that there
10 was a possible but not confirmed misclassification
11 issue.

12 Q. Are you aware that Dr. Bove had very
13 little information on where marines were barracked?

14 A. I don't know how to define "very
15 little." I think he -- my understanding is he and
16 his team at the ATSDR utilized the records that
17 were available and recollections from individuals
18 in classifying them into various groups.

19 Q. I'm handing you Exhibit 13.

20 (Exhibit 13 was marked for
21 identification and is attached to
22 the transcript.)

23 THE WITNESS: If I could add to my
24 last answer, it's discussed explicitly in this
25 on page 12, and Dr. Bove also notes that it's

1 likely to be non-differential, that any
2 exposure misclassification would be
3 non-differential.

4 BY MS. SILVERSTEIN:

5 Q. I handed you what is described on the
6 first page as the videotaped and videoconferenced
7 deposition of Dr. Frank J. Bove dated Thursday,
8 October 17th, 2024. Is that correct?

9 A. That's what it states.

10 Q. And you reviewed this deposition in
11 forming your conclusions?

12 A. I reviewed a deposition of Dr. Bove.
13 I don't recall if it was -- if he has been deposed
14 multiple times, I'm not aware, but I reviewed a
15 deposition.

16 Q. Directing you to your materials
17 considered list in your kidney cancer report, which
18 is on page 48. And you see there -- one, two,
19 three -- four up from the bottom, it says, "Bove,
20 FJ, deposition on October 17th through 18th, 2024,
21 correct?

22 A. Yes.

23 Q. So you reviewed this October 17th, 2024
24 transcript?

25 A. I believe so.

1 Q. If you turn to page 207. Are you on
2 page 207?

3 A. Yes.

4 Q. Beginning at line 25 it says:

5 "Answer: This is -- okay. And then
6 the second analysis takes into account where
7 we thought the units were barracked. Again,
8 we had very little information on that, and
9 the information we did have was from the CAP
10 members and people who had -- other Marines
11 who had recollections. The Marine Corps
12 couldn't help us. So where the barracks were
13 and the family housing records, and all that
14 were used with the modeling results.

15 "As you know, there were some
16 things we didn't know and learned maybe later
17 from the Marine Corps, for example, where
18 women were, were they with their unit, were
19 they at Camp Johnson. We never got a clear
20 answer on that, which added more problems with
21 that exposure-response analysis, using the
22 modeling and the residential exposure."

23 Did I read that correctly?

24 A. I believe you read that correctly.

25 Q. And if you turn to page 13 of

1 Exhibit 12. You are on page 13?

2 A. Yes.

3 Q. Do you see where it says "Conclusion"?

4 A. Yes.

5 Q. And if you look at the second sentence
6 under "Conclusion" it says, "However, the precision
7 of many hazard ratio measurements was low as
8 indicated by wide confidence intervals."

9 Did I read that correctly?

10 A. Yes, you read that correctly.

11 Q. If you could turn to page 7. Page 7 has
12 Table 4, which is Standardized Mortality Ratios,
13 SMRs, Underlying Cause of Death. Do you see that?

14 A. Yes.

15 Q. And do you see where it says kidney
16 cancer: In Table 4?

17 A. Yes.

18 Q. For Camp Lejeune the standardized
19 mortality ratio is 1.16, correct?

20 A. That's what's reported in this table.

21 Q. The confidence interval for that is 0.84
22 to 1.57, correct?

23 A. That's what's reported in this table.

24 Q. You agree that that means that
25 confidence interval includes 1?

1 A. This confidence interval includes 1,
2 yes, that's correct.

3 Q. The next line is bladder cancer. Do you
4 see that?

5 A. Yes.

6 Q. The standardized mortality ratio for
7 bladder cancer at Camp Lejeune is 0.84, correct?

8 A. That's what's reported in this table.

9 Q. Which means that the study did not
10 observe an increased risk, right?

11 MR. RUZICKA: Objection, form.

12 A. This, this result, doesn't reflect an
13 increased risk or an elevated measure of
14 association.

15 Q. On page 12 of your kidney cancer
16 report...

17 Are you on page 12?

18 A. Yes.

19 Q. In the last paragraph on page 12 the
20 second sentence says, "In an adjusted analysis with
21 a 10-year lag, the hazard ratio for kidney cancer
22 in Camp Lejeune personnel was 1.35," correct?

23 A. Yes, you read that correctly.

24 Q. If you turn to page 12 of Exhibit 12 --
25 oh, I'm sorry. I just gave you the wrong page.

1 Page 8. Excuse me. Do you see Table 5 on page 8?

2 A. Yes.

3 Q. Is this the result that you were
4 referring to when you said in an adjusted analysis
5 with a 10-year lag the hazard ratio for kidney
6 cancer in Camp Lejeune personnel was 1.35?

7 A. This is a hazard ratio of 1.35. I
8 believe this is the one I'm referring to, but
9 without reviewing the supplemental materials, I
10 can't tell you for sure that there is not a
11 different analysis that I was referring to.

12 Q. Okay. Well, in Table 5 the hazard ratio
13 is 1.35, correct?

14 A. Correct.

15 Q. And the confidential interval is 0.84 to
16 2.16, right?

17 A. Correct, as listed in this table.

18 Q. That means that the confidence interval
19 includes 1, right?

20 A. In this table.

21 Q. In this table the confidence interval
22 includes 1, correct?

23 A. In this table the confidence interval
24 includes 1.

25 Q. And the p value is 0.19, correct?

1 A. Correct, the p value is 0.19.

2 Q. And you would agree that 0.19 is greater
3 than 0.05, right?

4 A. Yes, I would agree that 0.19 is greater
5 than 0.05.

6 Q. The next line down is bladder cancer.
7 Do you see that?

8 A. Yes.

9 Q. The hazard ratio reported is 0.76,
10 correct?

11 A. Correct, the hazard ratio is 0.76 in
12 Table 5.

13 Q. Which does not indicate a positive
14 association, correct?

15 MR. RUZICKA: Objection, form.

16 A. There is not an elevated measure of
17 association identified for bladder cancer in this
18 analysis.

19 Q. If you could turn to your bladder cancer
20 report. Are you on page 7? Oh, sorry. Turn to
21 page 12 in your bladder cancer report.

22 Under "Exposure: Camp Lejeune Water," in
23 the second paragraph you acknowledge that the
24 primary measure of association for bladder cancer
25 was not elevated, correct?

1 A. Correct, or I state although the primary
2 measure of association was not elevated.

3 Q. If you could turn back to Exhibit 12,
4 and please turn to page 10. Do you see Table 7,
5 Hazard ratios, 95% confidence interval, for
6 categorical cumulative exposure and coefficients,
7 95% confidence interval, for continuous cumulative
8 exposure? Do you see that table?

9 A. Yes.

10 Q. The hazard ratio for kidney cancer is
11 only shown for PCE and total volatile organic
12 compounds in this table, correct?

13 A. Correct. In the -- in Table 7 it's for
14 kidney cancer, and only PCE and total volatile
15 organic compounds or chemicals is listed.

16 Q. You would agree that the high exposure
17 category for total volatile organic compounds for
18 kidney cancer shows a hazard ratio of 1.54,
19 correct?

20 A. Correct. In Table 7 the high exposure
21 is 1.54.

22 Q. And you would agree that the confidence
23 interval for high exposure in Table 7 for kidney
24 cancer is 0.63 to 3.75, correct?

25 A. Correct. The confidence interval is

1 0.63 to 3.75 in Table 7.

2 Q. And that means that the confidence
3 interval for total volatile organic compounds high
4 exposure for kidney cancer includes 1, right?

5 A. Yes. 1 is between 0.63 and 3.75.

6 Q. I'm handing you what we will mark as
7 Exhibit 14.

8 (Exhibit 14 was marked for
9 identification and is attached to
10 the transcript.)

11 BY MS. SILVERSTEIN:

12 Q. I handed you the text of the study
13 titled Mortality study of civilian employees
14 exposed to contaminated drinking water at U.S.
15 Marine Corps Base Camp Lejeune: a retrospective
16 cohort study, correct?

17 A. That's the correct title.

18 Q. This is a 2014 study, right?

19 A. Yes, this is 2014. And do you have the
20 supplemental files for this study?

21 Q. This study does not include the
22 supplemental files that I handed you, correct?

23 A. The printout you gave me does not
24 include the supplemental files. The study has four
25 supplemental files.

1 Q. Do you agree that this study has a
2 limitation and misclassification bias?

3 MR. RUZICKA: Objection, form.

4 A. It is subject to there is possible
5 misclassification. I don't know if -- how
6 substantial the limitation that is.

7 Q. But you agree that there is potential
8 misclassification in this study, right?

9 A. I -- as I just said, I agree that there
10 is potential misclassification in this study.

11 Q. And you agree that this study lacked
12 data on workers' water use, right?

13 A. Could you rephrase the question or
14 clarify?

15 Q. If you go to Exhibit 13, please, and
16 turn to page 246.

17 A. I'm on page 246.

18 Q. Starting at line 20 on page 246, do you
19 see that?

20 A. Yes.

21 Q. It says:

22 "Question: The last full paragraph,
23 which starts with 'Another serious
24 limitation.'" Do you see that?

25 "Answer: Yes.

1 "Question: You state, 'Another
2 serious limitation of the study was exposure
3 misclassification bias.'

4 "Answer: Uh-huh.

5 "Question: This is because you
6 assumed that all the Camp Lejeune workers
7 spent considerable time during the workday at
8 the Mainside area of the base --

9 "Answer: Right.

10 "Question: -- served by Hadnot
11 Point even though, undoubtedly, some did not
12 work at Mainside, right?

13 "Answer: Yes.

14 "Question: And additionally, you
15 didn't have information on the workers' water
16 usage, and some may have been unexposed
17 because they didn't use the drinking water?

18 "Answer: Yes.

19 "Question: You also assumed that
20 all the workers resided off base and were not
21 served by contaminated water at their
22 residences?

23 "Answer: Right. And I
24 subsequently learned that there may have been
25 some teachers that lived on base.

1 "Okay.

2 "Answer: You know, but -- you
3 know, we didn't distinguish teachers from the
4 rest of the workers."

5 Did I read that correctly?

6 A. Yes.

7 Q. If you could turn back to Exhibit 14,
8 and please turn to page 7.

9 THE VIDEOGRAPHER: I'm sorry, counsel.
10 Could we go off the record for a minute? I'm
11 having an audio issue.

12 MS. SILVERSTEIN: Sure.

13 THE VIDEOGRAPHER: The time is 11:57.
14 We are off the record.

15 (A short interruption.)

16 THE VIDEOGRAPHER: The time is
17 11:58 a.m. We are back on the record.

18 BY MS. SILVERSTEIN:

19 Q. Page 7 has Table 3, which is
20 Standardized Mortality Ratios, SMRs, Underlying
21 Cause of Death, correct?

22 A. Yes, that's the title of the table.

23 Q. And it is comparing Camp Pendleton to
24 Camp Lejeune, right?

25 A. Yes.

1 Q. You would agree that the standardized
2 mortality ratio for kidney cancer at Camp Lejeune
3 is 1.30, right?

4 A. That's what is stated in Table 3.

5 Q. And you would agree that the confidence
6 interval in Table 3 is 0.52 to 2.67, right?

7 A. Yes, that's what's dated in Table 3.

8 Q. And you would agree that the confidence
9 interval in Table 3 includes 1, right?

10 A. 1 is between 0.52 and 2.67.

11 Q. The standardized mortality ratio for
12 bladder cancer reported in Table 3 for Camp Lejeune
13 is 0.53, right?

14 A. Yes, that's what's stated in Table 3.

15 Q. And you would agree that that does not
16 indicate a positive association, right?

17 A. That's not an elevated measure of
18 association.

19 Q. The standardized mortality ratio for
20 bladder cancer at Camp Pendleton was 0.69, right?

21 A. That's what's stated in Table 3.

22 Q. And you would agree that Table 3 is
23 reporting a standardized mortality ratio for Camp
24 Lejeune -- for Camp Pendleton, excuse me, as higher
25 than the standardized mortality ratio at Camp

1 Lejeune, right?

2 A. 0.69 is greater than 0.53.

3 Q. If you could turn to page 8. Page 8
4 shows Table 4, Camp Lejeune versus Camp Pendleton:
5 Hazard ratios and 95% confidence intervals,
6 adjusted by sex, race, occupation (blue collar
7 versus white collar) and education, 10-year lag.
8 Do you see that?

9 A. Yes, I see that as the title of Table 4.

10 Q. And you would agree that the hazard
11 ratio for kidney cancer is 1.92, correct?

12 A. In Table 4 it's listed as 1.92.

13 Q. And you would agree that the confidence
14 interval is 0.58 to 6.34, correct?

15 A. The confidence interval for kidney
16 cancer in Table 4 is 0.58 to 6.34.

17 Q. You would agree that the confidence
18 interval for kidney cancer reported in Table 4
19 includes 1, right?

20 A. 1 is between 0.58 and 6.34.

21 Q. So that means it includes 1, right?

22 A. Yes. That's what I just stated.

23 Q. Would you agree that a hazard ratio of
24 0.58 to 6.34 is -- excuse me -- a confidence
25 interval of 0.58 to 6.34 is a wide confidence

1 interval?

2 MR. RUZICKA: Objection, form.

3 A. I think there is -- I think it depends
4 on the context of how you are evaluating whether
5 it's a wide confidence interval or not.

6 Q. When you evaluated Table 4, did you
7 consider 0.58 to 6.34 to be a wide confidence
8 interval?

9 A. I don't think I evaluated it in terms of
10 whether it was -- I would consider it wide or not.

11 Q. Did you consider the confidence
12 interval?

13 A. Yes.

14 Q. Did you determine that it shows a
15 precise point estimate?

16 MR. RUZICKA: Objection, form.

17 A. I'm not aware of a standard definition
18 for defining precision based on the confidence
19 interval, so I use it in part to evaluate the
20 precision of the point estimate.

21 Q. Sitting here today, do you agree that
22 the confidence interval 0.58 to 6.34 is a wide
23 confidence interval?

24 MR. RUZICKA: Objection, form, asked
25 and answered.

1 A. I don't think my opinion has changed
2 from the time I wrote the report, so I just
3 answered it with respect to my report, and I don't
4 think that opinion has changed.

5 Q. Sure. I think you said that you didn't
6 look at whether it was a wide confidence interval
7 for your report. Is that right?

8 A. I think I said I didn't evaluate it in
9 terms of whether it was wide or not.

10 Q. So what I'm asking here is, right now,
11 sitting here in this deposition, do you consider
12 the confidence interval 0.58 to 6.34 to be a wide
13 confidence interval?

14 MR. RUZICKA: Objection, form.

15 A. Again, I think as I said before, I don't
16 -- I think you have to evaluate it in the context
17 of what's being studied, and I don't know if
18 that -- I would consider that wide or not.

19 Q. So you have no opinion as to whether in
20 Dr. Bove's Camp Lejeune civilian mortality study
21 whether that confidence interval is a wide
22 confidence interval?

23 MR. RUZICKA: Objection, form.

24 A. I think the confidence interval is what
25 it is, like it's reported based on the number of --

1 the point estimate that is found in the number of
2 subjects in the distribution of the -- of the
3 population. So it's not as if it is a judgment
4 over whether it's wide or not. It's the confidence
5 interval that is associated with the data and the
6 dataset.

7 Q. Dr. Hatten, do you think there can ever
8 be a wide confidence interval for a study?

9 MR. RUZICKA: Objection, form.

10 A. I think it depends on how you are using
11 the term "wide." It's -- that's a subjective term
12 or a term that doesn't have a standard definition
13 with respect to biostatistics. It's -- generally
14 you would describe it as wider or less or narrower
15 in comparison to another evaluation of the data,
16 so...

17 Q. So there is not a range that you would
18 go from this is a narrow confidence interval to
19 this is a wide confidence interval; you don't have
20 a standard that you look at for that?

21 A. No, I don't have a numerical standard
22 that I apply to determine whether a confidence
23 interval is wide or narrow.

24 Q. The hazard ratio for bladder cancer in
25 Table 4 is 0.65, correct?

1 A. Correct. It's listed as 0.65 in
2 Table 4.

3 Q. And that does not indicate a positive
4 association, right?

5 MR. RUZICKA: Objection to form.

6 A. That's not -- that is not an elevated
7 measure of association.

8 Q. Dr. Hatten, are you aware that Camp
9 Pendleton is a Superfund site?

10 A. I don't -- I don't recall if I'm aware,
11 if I've ever -- if I have been aware of it or not,
12 so as I sit here I don't know if I'm aware of that.

13 Q. But sitting here right now do you -- you
14 don't recall knowing that Camp Pendleton was a
15 Superfund site, right?

16 A. No, although a Superfund is based on a
17 specific compound of concern, that it's a
18 environmental contamination mitigation program, and
19 it's typically based on a specific compound of
20 concern, so it would depend on what compound; or
21 defining it as a Superfund site would also
22 necessitate defining what the compound of concern
23 is at that site.

24 Q. Are you aware that EPA has stated that
25 the chemicals of concern at Camp Pendleton includes

1 TCE?

2 A. I don't recall if I'm -- if that's been
3 identified or not.

4 Q. Are you aware of that? Do you know?

5 A. I'm not aware one way or another whether
6 I have ever read that or not.

7 Q. And you are not aware of the levels of
8 contamination identified at Camp Pendleton,
9 correct?

10 A. I am not aware of quantitative levels of
11 contamination that -- if you are specifically
12 talking about TCE at Camp Pendleton that have been
13 identified.

14 I would point out again, you had a long
15 line of questioning about misclassification bias,
16 and again, Camp Pendleton, were there TCE there,
17 that would only serve to lower the point estimates
18 in a comparison with Camp Lejeune rather than raise
19 them if we accept that TCE is a cause of kidney
20 cancer.

21 Q. Would it be fair to say that in writing
22 your general causation reports on kidney cancer and
23 bladder cancer you did not consider the levels or
24 chemicals of contamination at Camp Pendleton?

25 A. I --

1 MR. RUZICKA: Objection, form. Go
2 ahead.

3 A. I reviewed them in the context of the
4 reporting in the studies out that compared Camp
5 Pendleton and Camp Lejeune. I do not -- I don't
6 recall looking specifically at any measured levels
7 of TCE at Camp Pendleton outside of what's reported
8 in these studies.

9 Q. Can you turn to page 13.

10 Oh, I'm sorry. Table 6, which is page
11 10. Are you on Page 10?

12 A. Yes.

13 Q. Page 10 has Table 6, which is Hazard
14 ratios, 95% confidence interval, for categorized,
15 less than median, more than or equal to median,
16 maximum cumulative exposure and coefficients, 95%
17 confidence interval, for continuous cumulative
18 exposure in micrograms per liter year, correct?

19 A. Correct. That's the title of Table 6.

20 Q. And under a kidney cancer, you would
21 agree that the greater than or equal to median
22 exposure for a total volatile organic compounds is
23 4.44, correct?

24 A. That's what's reported in Table 6.

25 Q. And you would agree that the confidence

1 interval is 0.52 to 38.19, correct?

2 A. Correct. The confidence intervals in
3 this table is 0.52 to 38.19.

4 Q. Dr. Hatten, do you consider 0.52 to
5 38.19 to be a wide confidence interval?

6 MR. RUZICKA: Objection, form.

7 A. Again, I don't know how much different
8 or I don't think this answer would be any different
9 than the previous question about confidence
10 intervals. This is the confidence interval that is
11 the result of the data. It is wider than the last
12 confidence interval we discussed, and as I said,
13 it's very hard to define something that's wide or
14 not wide unless you are talking about in relation
15 to another confidence interval that's reported. So
16 I would say this is wider than the previous
17 confidence interval we discussed.

18 Q. Would you agree that a confidence
19 interval of 0.52 to 38.19 indicates a lower level
20 of confidence?

21 MR. RUZICKA: Objection, form.

22 A. It indicates a lesser confidence in the
23 precision of the point estimate or a lower degree
24 of -- I will retract that. I think the answer as I
25 stated it should just stand.

1 Q. You can set that aside.

2 THE WITNESS: Do you know how much
3 longer you will go until a break, because I
4 think we do have lunch soon available soon,
5 so...

6 MS. SILVERSTEIN: We can take a break
7 here.

8 THE WITNESS: I will just check and
9 see if the food is here.

10 MS. SILVERSTEIN: Let's go ahead and
11 go off the record.

12 THE VIDEOGRAPHER: The time is 12:12
13 p.m. We are going off the record.

14 (Lunch recess taken.)

15 THE VIDEOGRAPHER: The time is 1:04
16 p.m. We are back on the record.

17 BY MS. SILVERSTEIN:

18 Q. Dr. Hatten, during the lunch break did
19 you talk to anybody about the substance of your
20 testimony today?

21 A. No.

22 Q. I am handing you Exhibit 15, I think, if
23 my counting is correct.

24 THE REPORTER: Yes.

25 MS. SILVERSTEIN: Thank you.

1 (Exhibit 15 was marked for
2 identification and is attached to
3 the transcript.)

4 BY MS. SILVERSTEIN:

5 Q. Dr. Hatten, I just handed you what is
6 titled Morbidity Study of Former Marines,
7 Employees, and Dependents Potentially Exposed to
8 Contaminated Drinking Water at U.S. Marine Corps
9 Base Camp Lejeune, correct?

10 A. Yes.

11 Q. And this is dated April 2018?

12 A. Correct.

13 Q. And you reviewed this study, ATSDR 2018,
14 as part of preparing your reports on kidney cancer
15 and bladder cancer, right?

16 A. Yes, that's correct.

17 Q. You would agree that the case finding
18 methodology in this 2018 report utilized a survey
19 with a limited response rate, right?

20 A. It was a -- the case finding was a
21 survey methodology. If I recall correctly, I think
22 the response rate was approximately 30 percent at
23 least for some components of the people.

24 Q. And you would agree that that's a
25 limited response rate?

1 A. It is the response rate that was
2 reported here.

3 Q. Dr. Hatten, if you could turn to page 13
4 of your kidney cancer report. Are you on page 13?

5 A. Yes.

6 Q. In the second paragraph -- the second --
7 so the second paragraph says, "Following these
8 mortality studies, the ATSDR conducted a morbidity
9 study focusing on kidney cancer diagnoses in former
10 marines, their families, and former base employees
11 compared to former Camp Pendleton residents."

12 Do you see where it says that?

13 A. Yes.

14 Q. The next sentence is, "Case finding
15 methodology utilized a survey with limited response
16 rate, making it difficult to fully exclude bias in
17 the primary, unlagged analysis." Correct?

18 A. Yes, that's correct.

19 Q. If -- turning back to morbidity, the
20 2018 morbidity study, if you could turn to page 54.
21 Are you on page 54?

22 A. Yes.

23 Q. Do you see the bolded heading that says
24 "Limitations"?

25 A. Yes.

1 Q. The first sentence under "Limitations"
2 says, "The study has several major limitations.
3 Surveys could not be sent to 20% of the cohort due
4 to lack of complete and accurate addresses for
5 mailing a survey. Additionally, some of the
6 surveys coded as 'not returned' likely did not
7 reach the intended recipient."

8 Is that correct?

9 A. You read that correctly.

10 Q. If you turn to the next page, page 55,
11 in that first paragraph as a continuation from
12 page 54, the last sentence says, "Nevertheless,
13 selection biases are still a concern because of the
14 low participation rate and past media coverage that
15 increased awareness among former Marines, civilian
16 employees, and dependents from Camp Lejeune of the
17 drinking water contamination issue and of possible
18 health problems from the exposure."

19 Is that correct?

20 A. You read that correctly.

21 Q. Looking at the next paragraph, the
22 second sentence says, "However, about 50 percent of
23 Marines and 40 percent of civilian employees did
24 not complete a HIPAA form to allow for medical
25 confirmation which reduced the precision of the

1 odds ratio estimate."

2 Is that correct?

3 A. You read that correctly.

4 Q. The next paragraph says, "In the
5 categorical analyses, there were small numbers of
6 cases for some of the diseases in the exposure
7 categories especially for civilian employees.
8 Therefore, confidence intervals were wide and these
9 results need to be interpreted cautiously."

10 Correct?

11 A. You read that correctly.

12 Q. The next paragraph starts, "There were
13 several sources of exposure misclassification for
14 the analysis of exposure-response trends for
15 specific contaminants, correct?

16 A. You read that correctly.

17 Q. At the top of page 56 it says that they
18 needed to rely to some extent on the recollection
19 of knowledgeable former Marines and current base
20 staff. Correct?

21 A. You read that correctly.

22 Q. And are you aware that ATSDR 2018 wasn't
23 peer reviewed?

24 A. My understanding is that there was an
25 internal review or an agency-level review, but it

1 was not submitted to a journal for peer review in a
2 journal.

3 Q. You can go ahead and set that aside.
4 I'm handing you what we will mark as Exhibit 16.

5 (Exhibit 16 was marked for
6 identification and is attached to
7 the transcript.)

8 BY MS. SILVERSTEIN:

9 Q. This is titled Cancer Incidence among
10 Marines and Navy personnel and Civilian Workers
11 Exposed to Industrial Solvents in Drinking Water at
12 U.S. Marine Corps Base Camp Lejeune: A cohort
13 Study. Correct?

14 A. You read that title correctly.

15 Just a question. Do you have the
16 supplemental material for this publication as well?

17 Q. I did not hand you the supplemental
18 material, correct?

19 A. I don't see it attached here. I'm
20 asking if it's available.

21 Q. No. I'm limiting my questions to the
22 text of the report.

23 The primary author on this report is
24 Bove, correct?

25 A. Correct.

1 Q. And this is a 2014 publication?

2 A. Correct, it was published in 2014.

3 Q. You are aware that the cancer incidence
4 study did not perform any statistical significance
5 testing, right?

6 A. My understanding is that not in a -- not
7 in the form that we have talked about previously.

8 Q. Are you referring to Dr. Bove's use of
9 confidence interval ratios?

10 A. Correct. Well, he calculated confidence
11 intervals for various findings, which is a form of
12 statistical significance testing, but I don't
13 believe he used p values or explicitly -- or
14 explicitly performed any statistical significance
15 tests.

16 Q. If you look in the results section on
17 page -- on the first page, this study discusses
18 CIRs or confidence interval ratios, correct?

19 A. Correct.

20 Q. Are you aware of any other scientific
21 literature that uses confidence interval ratios?

22 A. I am not able to provide you another
23 example at the moment, but I'm not sure if there
24 are or aren't other good examples.

25 Q. You can't think of any sitting here

1 today, correct?

2 A. Yes. I just said I'm not able to
3 provide you one, an example here while I'm sitting
4 here.

5 Q. In your experience, is a confidence
6 interval ratio a standard evaluation tool in
7 epidemiology studies?

8 A. I don't -- I don't know if it's standard
9 or not. As I said, I don't have another example to
10 provide you. However, confidence intervals were
11 reported in this, and that's where he derived the
12 confidence intervals ratios from.

13 Q. To the best of your knowledge, are
14 confidence interval ratios a widely-used analysis
15 tool in the scientific community?

16 A. To the best of my knowledge, no, they
17 are not widely used.

18 Q. And you are aware that no individualized
19 exposure assessments were performed for this study,
20 correct?

21 A. Could you clarify exactly what you are
22 asking?

23 Q. Did Dr. Bove perform an individualized
24 exposure assessment on any of the study
25 participants for this study?

1 A. I don't believe he performed a
2 individualized exposure assessment for the
3 individuals --

4 Q. And you --

5 A. -- in the form of -- in the form of him
6 modeling exposure for each individual person.

7 Q. Dr. Hatten, did you review the preprint
8 version of the cancer incidence study?

9 A. I have reviewed the preprint version.
10 (Exhibit 17 was marked for
11 identification and is attached to
12 the transcript.)

13 BY MS. SILVERSTEIN:

14 Q. I'm handing you Exhibit 17. This is
15 titled Evaluation of Cancer incidence among Marines
16 and Navy personnel and civilian workers exposed to
17 contaminated drinking water at U.S. Marine Corps
18 Base Camp Lejeune: a cohort study, correct?

19 A. Yes, you read that correctly.

20 Q. And at the bottom of the first page it
21 says, "Note: This preprint reports new research
22 that has not been certified by peer review and
23 should not be used to guide clinical practice,"
24 correct?

25 A. I see that note. Yes, you read it

1 correctly.

2 Q. And did you review this publication in
3 forming your opinions as to general causation for
4 kidney cancer or bladder cancer?

5 A. I reviewed this publication, but I also
6 reviewed the final published version and used the
7 information contained in the final published
8 version in developing my opinions.

9 Q. So you did review this preprint version
10 then?

11 A. I've reviewed both versions.

12 Q. If you could turn to table -- I ask
13 first, do you see the Bates stamps on the bottom,
14 CLJA_ATSDR_BOVE-0000060601?

15 A. Yes.

16 Q. Please turn to the Bates stamp ending in
17 60148. This is Table 2. Do you see Table 2?

18 A. Yes.

19 Q. Table 2 says, "Standardized Incidence
20 Rates and Poisson" -- I'm not sure if I am
21 pronouncing that correctly -- "regression results:
22 Marines/Navy personnel subgroup." Do you see that?

23 A. Yes.

24 Q. To the best of your recollection, this
25 table wasn't included in the final version of the

1 cancer incidence study, correct?

2 A. I can compare the two if you want just
3 to confirm. I just -- I would have to compare the
4 two.

5 Q. Sure, go ahead and take a look.

6 A. I do not see that same table. I will
7 note that I don't have access to the supplemental
8 files associated with this, with the final
9 publication to verify that it's not contained in
10 one of those.

11 Q. So you didn't see it in what is marked
12 as Exhibit 16, correct?

13 A. Not in the Exhibit 16 that you provided
14 me.

15 Q. Table 2 shows the standard incident rate
16 at Camp Lejeune for urinary bladder cancer. Do you
17 see that row?

18 A. Yes.

19 Q. The standardized incidence rate for
20 bladder cancer at Camp Lejeune is 0.90, correct?

21 A. Yes.

22 Q. Do you agree that 0.9 -- a standard
23 incidence rate of 0.90 doesn't show an elevated
24 association, correct?

25 A. That is not an elevated measure of

1 association when compared to the general
2 population.

3 Q. And you would agree that as compared to
4 Camp Pendleton, the standardized incident rate is
5 1.08, correct?

6 A. This is a relative rate.

7 Q. The relative risk is 1.08?

8 A. It's a -- sorry. It's a risk ratio is
9 what's -- the RR in this table is reported as a
10 risk ratio, and it's reported at 1.08.

11 Q. The next row shows kidney and renal
12 pelvis cancer. Do you see that?

13 A. Yes.

14 Q. You would agree that the standard
15 incident rate for Camp Lejeune shown in this table
16 is 1.03, correct?

17 A. It's reported as 1.03 in this table.

18 Q. Would you typically consider 1.03 to
19 show an elevated measure of association?

20 A. It is a positive in the sense that it's
21 greater than 1 measure of association that I
22 typically would not consider 1.03 to be elevated.

23 Q. I want to go back to Exhibit 16. If you
24 could turn to page 7. Page 7 shows Table 3, which
25 is titled Comparison of cancer outcomes at Camp

1 Lejeune versus Camp Pendleton among the
2 Marines/Navy personnel subgroup who began active
3 duty and were stationed at either base between 1975
4 and 1985. Correct?

5 A. Yes, you read that correctly.

6 Q. If you scroll down -- not scroll down --
7 go down on the cancer outcomes, you see kidney and
8 renal pelvis cancer. Do you see that?

9 A. Yes.

10 Q. The adjusted hazard ratio, confidence
11 interval ratio is 1.06. Or, excuse me, the
12 adjusted hazard ratio is 1.06, correct?

13 A. Yes, it's listed as 1.06 in Table 3.

14 Q. Would you typically consider 1.06 to be
15 evidence of an increased measure of association?

16 MR. RUZICKA: Objection, form.

17 A. I think it would depend on the way the
18 study was designed, although most times I would not
19 consider 1.06 to be evidence of an elevated measure
20 of association.

21 Q. If you see a few lines up from that, it
22 says urinary bladder. Do you see that?

23 A. Yes.

24 Q. The adjusted hazard ratio for urinary
25 bladder cancer is 1.09, correct?

1 A. Yes, that's what's listed in Table 3.

2 Q. Would you typically consider a hazard
3 ratio of 1.09 to be evidence of an increased
4 measure of association?

5 MR. RUZICKA: Objection, form.

6 A. It is a positive measure of association.
7 However, I typically have not and would not
8 consider 1.09 to be an elevated measure of
9 association.

10 Q. You can go ahead and set that document
11 aside. I am handing you Exhibit 18.

12 (Exhibit 18 was marked for
13 identification and is attached to
14 the transcript.)

15 BY MS. SILVERSTEIN:

16 Q. I handed you Exhibit 18. This is titled
17 Evaluation of mortality among Marines, Navy
18 personnel and civilian workers exposed to
19 contaminated drinking water at U.S. Marine Corps
20 Base Camp Lejeune: a cohort study, correct?

21 A. Yes, you read that correctly.

22 Q. The primary author on this study is
23 Bove?

24 A. Yes, that's correct.

25 Q. And this is a 2024 publication, right?

1 A. Yes, it was published in 2024.

2 Q. You would agree that for this study no
3 individualized exposure assessment was performed,
4 correct?

5 A. I don't believe Dr. Bove calculated an
6 individual exposure or did an individual exposure
7 calculation for each person.

8 Q. You would agree that myelodysplastic
9 syndrome was the only reported result with a
10 monotonic trend for exposure response, correct?

11 I'm handing you Exhibit 19.

12 (Exhibit 19 was marked for
13 identification and is attached to
14 the transcript.)

15 BY MS. SILVERSTEIN:

16 Q. I just handed you Exhibit 19, which on
17 the front says "Deposition of Frank J. Bove" and is
18 dated October 18th, 2024, correct?

19 A. Yes, I think you read that correctly.

20 Q. And this is the second day of deposition
21 testimony that you listed in your materials
22 considered as something you reviewed, correct?

23 A. I believe so.

24 Q. Please turn to page 25.

25 A. Yes.

1 Q. On page 25 beginning at line 7 it says:

2 "Question: So in this article the
3 only results that you report for the
4 exposure-response analysis are for the
5 monotonic trends that were observed for
6 myelodysplastic syndrome, correct?

7 "Answer: Myelodysplastic syndrome.

8 "Question: Yes. Thanks for that
9 correction -- in the Marine/Navy cohort and
10 kidney cancer and the civilian worker cohort,
11 correct?

12 "Answer: No. I reported all the
13 findings?

14 "Question: Okay, but as far as in
15 the text of the report?

16 "Answer: Oh, yes, in the text,
17 yes.

18 "Question: The findings themselves
19 are included in the tables, right?

20 "Answer: Yes."

21 And so looking at Dr. Bove's report, are
22 you aware of any monotonic trends other than
23 myelodysplastic syndrome that showed a monotonic
24 trend for exposure-response?

25 MR. RUZICKA: Objection, form.

1 A. Could you clarify the question?

2 Q. We can go to a different question.

3 Please turn to exhibit -- back to

4 Exhibit 19. Turn to supplemental Table 6.

5 A. Is it 18 or 19? 18 is the study and 19
6 is the deposition Day 2.

7 Q. Excuse me. Turn to Exhibit 18.

8 Are you at Table S6?

9 A. Yes.

10 Q. Table S6 is, "Hazard Ratios and 95
11 percent lower and upper confidence intervals for
12 the Marines/Navy personnel subgroup analysis of
13 base duration between 1975 and 1985 at Camp Lejeune
14 with Camp Pendleton as reference: Underlying cause
15 of death." Correct?

16 A. Yes, you read that correctly.

17 Q. Would you agree that Table S6 shows an
18 inverse exposure-response relationship for kidney
19 cancer?

20 A. It shows a inverse or it shows a
21 monotonically decreasing exposure-response
22 relationship using duration on base as the metric
23 of exposure.

24 Q. And if you can turn to Table S8.

25 Are you at Table S8?

1 A. Yes.

2 Q. Table S8 shows the hazard ratios and 95%
3 lower and upper confidential intervals for the
4 analysis of civilian employees' employment duration
5 at Camp Lejeune between October 1972 and October
6 1985 with Camp Pendleton as reference: Underlying
7 the cause of death. Correct?

8 A. Correct.

9 Q. And do you see urinary bladder listed
10 under "Outcome"?

11 A. Yes.

12 Q. Table S8 shows an inverse
13 exposure-response relationship for bladder cancer,
14 correct?

15 A. It shows a decreasing exposure-response
16 relationship using duration on base for civilian
17 employees as the metric of exposure.

18 Q. You can go ahead and set that document
19 aside. If you can turn back to your kidney cancer
20 report. I know it's a lot of jumping around
21 between documents.

22 Do all of the opinions contained in your
23 kidney cancer report apply to both clear cell renal
24 cell carcinoma and papillary cell renal cell
25 carcinoma?

1 A. In the majority of cases that I -- or
2 majority of studies that I base my -- that I
3 evaluated, those were not separated into separate
4 conditions. There are some that are separated.
5 However, I don't know that there is a large enough
6 body of evidence to separate out individualized
7 assessments for each subtype of kidney cancer.

8 Q. So would it be fair to say that your
9 opinions apply to -- in this kidney cancer report
10 apply to both clear cell renal cell carcinoma and
11 papillary cell renal cell carcinoma?

12 A. Yes, unless noted explicitly that there
13 is an exception. I don't believe I put that in the
14 report, but I can't state that for sure without
15 reviewing the entire report again.

16 Q. Do your opinions regarding clear cell
17 and papillary cell renal cell carcinoma -- let me
18 rephrase that.

19 Do the opinions contained in your kidney
20 cancer report apply to upper tract urothelial
21 cancer?

22 A. I believe I explicitly addressed that on
23 page 10 under Outcome of Interest where I state,
24 "Although more similar histologically to bladder
25 tumors, most authors that do not separately analyze

1 urothelial tumors include them with kidney cancers.
2 The measures of association in studies that include
3 urothelial/renal pelvis cancers are similar to
4 studies that do not include urothelial cancers.
5 See Appendix 1: table.

6 "Furthermore, in studies that directly
7 compare urothelial/renal pelvis cancers to other
8 kidney cancers, the measures of associations" --
9 "measure of association there are similar."

10 I reference Lynge 1997; Raaschou,
11 R-a-a-s-c-h-o-u, dash, Nielsen 2003.

12 "Urothelial/renal pelvis cancers occur
13 in the kidney, and the kidney cancer
14 epidemiological studies apply for purposes of this
15 causation analysis. All four of the toxins at
16 issue cause upper tract urothelial carcinoma."

17 Q. So going back to my question, the answer
18 is yes, the opinions that you provide in your
19 kidney cancer report you maintain do apply to upper
20 tract urothelial cancer, correct?

21 A. Yes, as I just read from my report.

22 Q. I want to turn to the TCE section of
23 your kidney cancer report which begins on page 16.
24 Do you see that?

25 A. Yes.

1 Q. And then if you turn to page 22 and 23,
2 you do a Bradford Hill analysis, correct?

3 A. I organized the considerations using a
4 Bradford Hill framework.

5 Q. So I noticed that I asked you if did a
6 Bradford Hill analysis and you reframed it as you
7 organized it using the framework. Did you apply
8 the Bradford Hill criteria to the literature that
9 you reviewed as part of forming your conclusions?

10 MR. RUZICKA: Objection, form.

11 A. Yes. I don't really see a difference
12 between the two. I'm just being very clear because
13 -- or trying to be very explicit that the purpose
14 of a Bradford Hill analysis -- I'm using air quotes
15 which aren't evident in a deposition transcript,
16 but is that it is not a formulaic -- it's not a
17 formula. You apply it as a way of organizing a
18 discussion of causation and developing a causation
19 determination. It's not a -- there is not a way to
20 just plug the data in and just get a result from a
21 Bradford Hill analysis.

22 Q. Sure. You used the Bradford Hill
23 framework to go through the literature and see what
24 the weight of the evidence was, correct?

25 A. Correct.

1 Q. So on page 22, do you see the heading
2 "Strength of Association"?

3 A. Yes.

4 Q. And so this is where you are discussing
5 studies that you believe show an elevated measure
6 of association for TCE and kidney cancer, correct?

7 A. Correct.

8 Q. One of the studies you cited is Axelson
9 1994, right?

10 A. Yes.

11 Q. I'm handing you Exhibit 20.

12 (Exhibit 20 was marked for
13 identification and is attached to
14 the transcript.)

15 BY MS. SILVERSTEIN:

16 Q. I have handed you a document titled
17 Updated and Expanded Swedish Cohort Study on
18 Trichloroethylene and Cancer Risk, right?

19 A. Yes, that's the title.

20 Q. And this is Axelson 1994?

21 A. I will just confirm. Yes.

22 Q. Since you cited Axelson in your kidney
23 cancer report, would it be fair to say that you
24 consider it a reliable study?

25 A. I consider it reliable in the sense that

1 it is informative and a methodologically sound
2 study.

3 Q. If you could turn to page 560, see
4 Table 3. Are you at Table 3?

5 A. Yes.

6 Q. This is overall cancer morbidity 1958 to
7 1987 in trichloroethylene-exposed men less than 79
8 years, right?

9 A. Less than or equal to 79 years.

10 Q. Thank you. Less than or equal to 79
11 years.

12 A. Yes, you read the rest of it correctly.

13 Q. If you go down, do you see kidney
14 cancer?

15 A. Yes.

16 Q. And the standardized incident rate is
17 1.16, correct?

18 A. Yes.

19 Q. The confidence interval is 0.42 to 2.52,
20 correct?

21 A. Yes, you read that correctly.

22 Q. And that means that the confidence
23 interval for kidney cancer includes 1, right?

24 A. Yes. The 1 is between 0.42 and 2.52.

25 Q. You will see the next line says "bladder

1 cancer." Do you see that?

2 A. Yes.

3 Q. And the standardized incident rate for
4 bladder cancer is 1.02, correct?

5 A. Yes.

6 Q. And 1.02 is a standardized incident rate
7 that you observe as a positive but not an elevated
8 measure of association, correct?

9 A. Yes, that's how I would characterize
10 1.02.

11 Q. If you could turn back to the first page
12 of the study, page 556, do you see italicized
13 paragraph on the left?

14 A. Yes.

15 Q. The last sentence says, "It is concluded
16 that this study provides no evidence that
17 trichloroethylene is a human carcinogen, i.e., when
18 the exposure is as low as for this study
19 population." Correct?

20 A. You read those words correctly.

21 Q. And based off of that statement, the
22 authors in Axelson 1994 concluded that their study
23 did not show that trichloroethylene was a human
24 carcinogen, right?

25 MR. RUZICKA: Objection, form.

1 A. I don't know that they made a conclusion
2 with respect to whether or not based on their study
3 trichloroethylene could be assessed as a human
4 carcinogen. I think they are stating that they
5 don't feel like it provides additional evidence.

6 Q. They state that the study provides no
7 evidence that trichloroethylene is a human
8 carcinogen, right?

9 MR. RUZICKA: Object to form.

10 A. I don't see a difference between that
11 and the answer I just provided you.

12 Q. Okay. Did I -- is that what the authors
13 say, that their study provides no evidence that
14 trichloroethylene is a human carcinogen, right?

15 MR. RUZICKA: Objection to form.

16 A. That is what the authors state in that
17 sentence.

18 Q. But you relied on Axelson 1994 to show
19 strength of association for kidney cancer, correct?

20 A. This is one of the studies that I
21 pointed out that demonstrated an elevated measure
22 of association.

23 Q. Another study that you relied on to show
24 strength of association is Blair 1998, correct?

25 A. Yes.

1 Q. I am handing you Exhibit 21.
2 (Exhibit 21 was marked for
3 identification and is attached to
4 the transcript.)

5 BY MS. SILVERSTEIN:

6 Q. I just handed you a document titled
7 Mortality and cancer incidence of aircraft
8 maintenance workers exposed to trichloroethylene
9 and other organic solvents and chemicals: extended
10 followup, correct?

11 A. Yes.

12 Q. This is Blair 1998 as cited in your
13 report?

14 A. I believe so.

15 Q. So I want you to look on the left-hand
16 side of the page in that first long paragraph. Do
17 you see where I'm looking?

18 A. I'm not. You will have to --

19 Q. Do you see the bolded paragraph on the
20 left-hand side of the page under "Abstract"?

21 A. Yes, although I don't think it's a
22 single paragraph. It's a single column with a
23 number of subheadings.

24 Q. Do you see where it says "Results"?

25 A. Yes.

1 Q. And then do you see about halfway down
2 that section it says, "Workers exposed to
3 trichloroethylene showed non-significant excess
4 cases" -- "non-significant excess for..."

5 Do you see that?

6 A. Yes.

7 Q. One of the diseases that they list is
8 kidney cancer, correct?

9 A. Correct, with a relative risk of 1.6 or
10 a risk ratio, I think. I don't know which they are
11 reporting. I will have to look through it.

12 Q. You see where they say workers exposed
13 to trichloroethylene showed non-significant
14 excesses for kidney cancer, correct?

15 A. Sorry. I'm finishing the prior question
16 you asked. The "RR" stands for rate ratios in this
17 study.

18 Q. And my question was if after the
19 statement "workers exposed to trichloroethylene
20 showed non-significant excesses for" and they
21 listed kidney cancer. Is that correct?

22 A. Correct, with a rate ratio of 1.6.

23 Q. Do you see where it says "Conclusion"?

24 A. Yes.

25 Q. The first sentence after "Conclusion"

1 is, "These findings do not strongly support a
2 causal link with trichloroethylene because the
3 associations were not significant, not clearly
4 dose-related, and inconsistent between men and
5 women."

6 Do you see where it says that?

7 A. You read that correctly.

8 Q. I'm going back to results. The
9 second-to-the-last paragraph under "Results" says,
10 "None of these cancers showed an exposure-response
11 gradient and other risk ratios among workers
12 exposed to other chemicals but not
13 trichloroethylene often had risk ratios as large as
14 workers exposed to trichloroethylene."

15 Did I read that correctly?

16 A. No, you didn't.

17 Q. Is "RR" relative risk?

18 A. No.

19 Q. What is "R," since you just looked?

20 A. It was rate ratio.

21 Q. Risk ratio, correct?

22 A. It was rate ratio. Is that what I just
23 said?

24 Q. Okay. Well, I will go ahead and read it
25 as RR then?

1 A. Rate ratios.

2 Q. "None of these cancers showed an
3 exposure-response gradient and rate ratios among
4 workers exposed to other chemicals but not
5 trichloroethylene often had rate ratios as large as
6 workers exposed to trichloroethylene." Correct?

7 A. You read that correctly.

8 Q. In your kidney cancer report, do you
9 state what exposure level of trichloroethylene can
10 cause kidney cancer?

11 MR. RUZICKA: Objection, form.

12 A. I report the levels that have been
13 associated with kidney cancer in studies of humans.

14 Q. And where do you report that?

15 A. So beginning on page 36 there is a
16 entire section of entitled Levels of Toxic Exposure
17 that are Hazardous to Humans Generally are Known to
18 Cause Kidney Cancer."

19 Q. Looking at this section, the only number
20 in terms of exposure that I see is on page 37. You
21 say, "This is the low exposure group of more than 1
22 to 4,600 micrograms per liter a month in the Bove
23 2014a study."

24 Is there anywhere else in this section
25 that you quantify what level of TCE exposure can

1 cause kidney cancer?

2 MR. RUZICKA: Objection, form.

3 A. Yes. There are multiple other instances
4 where I list a level that has been associated with
5 kidney cancer in a study in humans or has been
6 demonstrated to be associated with kidney cancer in
7 humans.

8 Q. And do you have an opinion as to -- if
9 someone were to say to you, "Dr. Hatten, what level
10 of TCE exposure does a person have to have for it
11 to be possible that that TCE causes kidney cancer,"
12 what amount of exposure would you tell them?

13 A. I would tell them --

14 MR. RUZICKA: Objection, form.

15 A. I would tell them what I stated in my
16 report, that these have been identified in studies
17 as being associated with kidney cancer in people.

18 I don't think we have a defined lower
19 bound for what level of exposure can cause kidney
20 cancer, but it is measured all the way down to a
21 group that is very, very low, such as greater than
22 1 microgram per liter month to 3100 micrograms per
23 liter month in the Bove 2014a study.

24 Q. You just said we don't have a lower
25 bound of exposure, correct?

1 MR. RUZICKA: Objection, form.

2 A. I'm saying we don't know what the lower
3 bound is, but it's been reported down to the group
4 that is greater than 1 to 3100.

5 Q. Are you aware of any study by an author
6 other than Bove that concluded that?

7 MR. RUZICKA: Objection, form.

8 A. That concluded, that identified this
9 level?

10 Q. Correct.

11 A. Not that identified this level, I'm not
12 aware of another study.

13 I just want to clarify I gave you a
14 dosing range that Bove reported. There is also,
15 for example, on page 40 Andrew reported a exposure
16 group with an associated -- association with kidney
17 cancer in a contaminated water supply with a metric
18 that is even lower than that. It's greater than
19 zero to 27.6 micrograms per liter. So that
20 exposure group is also associated. They are not
21 exactly the same, but they are similar orders of
22 magnitude.

23 Q. I'm handing you Exhibit 22 which, I
24 apologize, is very large, and I am handing counsel
25 a copy of the chapter that I will be asking about.

1 (Exhibit 22 was marked for
2 identification and is attached to
3 the transcript.)

4 BY MS. SILVERSTEIN:

5 Q. I handed you a document titled
6 Toxicological Review of Trichloroethylene, correct?

7 A. Correct. You read the title correctly.

8 Q. And this is dated September 2011?

9 A. Yes.

10 Q. And the bottom of the page it says,
11 "U.S. Environmental Protection Agency in
12 Washington, D.C.," correct?

13 A. Yes, that's correct.

14 Q. Are you familiar with this document?

15 A. I've reviewed this document.

16 Q. And you listed it in your materials
17 considered list for your reports, correct?

18 A. I believe so.

19 Q. If you could turn to page 5-139. I am
20 also happy to hand you the chapter instead of the
21 whole document, if you would prefer that.

22 A. That's okay. I will find it.

23 5-139, is that correct?

24 Q. Yeah, correct.

25 A. I am on 5-139.

1 Q. And you see the section at the top,
2 5.2.2, Dose-Response Analysis: Human
3 Epidemiological Data?

4 A. Yes, I see that.

5 Q. About halfway through the paragraph
6 there is a sentence that starts, "While the
7 detailed approach." Do you see that?

8 A. Yes.

9 Q. It says, "While the detailed approach
10 used by Moore, et al., 2010 should be fairly
11 reliable for general rankings, the resulting
12 estimates are not expected to be as quantitatively
13 accurate as those in the Charbotel, et al., 2006
14 study, which relied on a task-exposure matrix based
15 on decades of measurements from the Arve-Valley
16 workshops, Fevotte, et al., 2006. See also Section
17 4.4 for more discussion of the exposure
18 assessments."

19 Did I read that correctly?

20 A. I believe so.

21 Q. Looking at the next sentence, EPA,
22 quote, thus determined, quote, "Thus, the
23 Charbotel, et al., 2006 study was selected as the
24 sole basis for the derivation of an inhalation unit
25 risk estimate for kidney cancer." Is that correct?

1 A. You read that correctly.

2 Q. You can go ahead and set aside that very
3 large document.

4 I'm handing you Exhibit 23, fortunately
5 not as large as the last one.

6 (Exhibit 23 was marked for
7 identification and is attached to
8 the transcript.)

9 BY MS. SILVERSTEIN:

10 Q. I just handed you a document titled
11 Case-Control Study on Renal Cell Cancer and
12 Occupational Exposure to Trichloroethylene Part II:
13 Epidemiological Aspects, correct?

14 A. Yes, that's correct.

15 Q. This is dated 2006?

16 A. Yes.

17 Q. And the main author on this is Barbara
18 Charbotel, correct?

19 A. Yes, or that's the first author.

20 Q. Would you agree that Charbotel 2006 only
21 found a statistically significant increase where
22 the exposure was 335 parts per million year or
23 more?

24 A. I would have to review the study to --

25 Q. Did you consider this study in your

1 kidney cancer report?

2 A. Yes.

3 Q. Go ahead and turn to page 782. Do you
4 see Table 6?

5 A. Yes.

6 Q. Table 6 is the relation between exposure
7 to TCE and renal cell carcinoma as a function of
8 the three indicators, conditional logistic
9 regression matching on sex and age, correct?

10 A. Yes, you read that correctly.

11 Q. And do you see the column to the far
12 right, adjusted odds ratio?

13 A. Yes.

14 Q. And do you see where it says "cumulative
15 dose"?

16 A. Yes.

17 Q. And you would agree that the low
18 cumulative dose is 1.62, correct?

19 A. That's what's reported in this table,
20 you read that correctly.

21 Q. And you would agree that the confidence
22 interval for the low cumulative dose is 0.75 to
23 3.47, correct?

24 A. Yes, you read that correctly.

25 Q. That includes the -- that confidence

1 interval includes 1, right?

2 A. Yes. 1 is between 0.75 and 3.47.

3 Q. The median cumulative dose adjusted odds
4 ratio is 1.15?

5 A. Yes. You read that correctly.

6 Q. And the confidence interval there also
7 includes 1, right?

8 A. Yes. 1 is between 0.47 and 2.77.

9 Q. So that means that according to this
10 table for cumulative dose, the only adjusted odds
11 ratio that did not include 1 is for high cumulative
12 dose, correct?

13 MR. RUZICKA: Objection, form.

14 A. That's the only entry under adjusted
15 odds ratio under cumulative -- for cumulative dose
16 where the confidence interval does not include 1.

17 Q. You can go ahead and set that document
18 aside.

19 In your kidney cancer report, if you'd
20 look at page 22. Are you on page 22?

21 A. Yes.

22 Q. Do you see the exposure-response
23 section?

24 A. Yes.

25 Q. One of the studies that you cite there

1 is Kelsh, correct?

2 A. Yes.

3 Q. And you say multiple studies have
4 demonstrated monotonic exposure-response for
5 increased intensity of TCE exposure with increased
6 kidney cancer before citing Kelsh 2010?

7 A. Yes.

8 Q. I'm handing you Exhibit 24.

9 (Exhibit 24 was marked for
10 identification and is attached to
11 the transcript.)

12 BY MS. SILVERSTEIN:

13 Q. I just handed you a document entitled
14 Occupational Trichloroethylene Exposure and Kidney
15 Cancer, A Meta-Analysis, correct?

16 A. Yes.

17 Q. This is Kelsh 2010, right?

18 A. Yes, Kelsh 2010.

19 Q. I want to direct you to in the right --
20 in the left-hand column, excuse me, the section
21 that says "Conclusions." Do you see that?

22 A. Yes.

23 Q. It says, "Positive associations were
24 observed across various study groups. However,
25 considerations of unmeasured potential confounding,

1 lack of quantitative exposure assessment and lack
2 of exposure-response patterns limit epidemiologic
3 insight into the role of trichloroethylene exposure
4 and its potential causal association with kidney
5 cancer."

6 Did I read that correctly?

7 A. You have read those words correctly.

8 Q. In your kidney cancer report on page
9 23 -- do you see page 23?

10 A. Yes.

11 Q. Under "Analogy" you agree that the
12 analogous evidence you identified for TCE and
13 kidney cancer was PCE exposure, right?

14 A. Correct.

15 Q. In your section on TCE and kidney cancer
16 you didn't cite Michalek 2019, correct?

17 A. I don't recall citing that.

18 MS. SILVERSTEIN: We have been going
19 for about an hour. It is a good time to take
20 a short break.

21 THE VIDEOGRAPHER: The time is
22 2:05 p.m. We are off the record.

23 (Recess taken.)

24 THE VIDEOGRAPHER: The time is
25 2:11 p.m. We are back on the record.

1 BY MS. SILVERSTEIN:

2 Q. Dr. Hatten, did you discuss the
3 substance of your testimony with anybody on the
4 break?

5 A. No.

6 Q. I want to turn to your analysis of PCE
7 and kidney cancer. It begins on page 24 of your
8 kidney cancer report. In that section beginning on
9 page 27 you have a section titled "Bradford Hill:
10 PCE," correct?

11 A. Yes.

12 Q. Under Strength of Association one of the
13 studies that you cited is a Vlaanderen 2013?

14 A. Yes.

15 (Exhibit 25 was marked for
16 identification and is attached to
17 the transcript.)

18 BY MS. SILVERSTEIN:

19 Q. I handed you a -- I handed you
20 Vlaanderen 2013, correct?

21 A. Yes.

22 Q. And this is a study that you relied on
23 in your report, right?

24 A. This is one of the studies I evaluated
25 in my report.

1 Q. And one of the studies that you cited as
2 supporting strength of association, correct?

3 A. Yes.

4 Q. I want to direct your attention to the
5 left-hand column on the first page that says
6 "Results." Do you see that?

7 A. Yes.

8 Q. Under "Results" the author wrote,
9 "Hazard ratios for liver cancer, NHL and MM but not
10 kidney cancer were slightly elevated in groups with
11 high exposure to perchloroethylene compared to
12 occupationally exposed subjects," correct?

13 A. You read that correctly.

14 Q. For strength of association you also
15 cited a study Aschengrau 1993, correct?

16 A. Correct.

17 Q. And you cited Aschengrau as a study that
18 supports strength of association for PCE and kidney
19 cancer, right?

20 A. Yes.

21 Q. I'm handing you Exhibit 26.

22 (Exhibit 26 was marked for
23 identification and is attached to
24 the transcript.)

25 BY MS. SILVERSTEIN:

1 Q. This document is titled Cancer Risk and
2 Tetrachloroethylene-Contaminated Drinking Water in
3 Massachusetts, correct?

4 A. Yes.

5 Q. And you'd agree that tetrachloroethylene
6 and perchloroethylene are the same substance,
7 right?

8 A. Yes.

9 Q. So that means that tetrachloroethylene,
10 when I refer to PCE, I'm referring to the same
11 thing, right?

12 A. Yes, that's my understanding.

13 Q. If you could turn to page 289. Do you
14 see Table 4?

15 A. Yes.

16 Q. Table 4 is titled History of PCE
17 Exposure among Cases and Controls, With and Without
18 Considering Latency, Crude Odds Ratio and 95%
19 Confidence Intervals. Is that correct?

20 A. Yes, that's correct.

21 Q. Table 4 reports no results for PCE and
22 kidney cancer with latency, correct?

23 A. Correct. My understanding is that the
24 number of cases were too low to do any analysis.

25 Q. And Table 4 with latency -- excuse me.

1 Table 4 without latency reports the crude odds
2 ratio for kidney cancer as 1.23, correct?

3 A. For any exposure to PCE, the crude odds
4 ratio is 1.23 in Table 4.

5 Q. And for any exposure for kidney cancer
6 without latency, the confidence interval is 0.40 to
7 3.11, correct?

8 A. Yes, you read that correctly.

9 Q. Table 4 reports no results for high TCE
10 exposure without latency, correct?

11 A. Yes. My understanding is the number of
12 cases were too low to perform any analysis.

13 Q. You can go ahead and set that document
14 aside. Another study that you cited for strength
15 of association for PCE and kidney cancer is Anttila
16 1995, right?

17 A. Yes.

18 Q. I'm handing you Exhibit 26.

19 THE REPORTER: 27.

20 MS. SILVERSTEIN: 27, excuse me.

21 (Exhibit 27 was marked for
22 identification and is attached to
23 the transcript.)

24 BY MS. SILVERSTEIN:

25 Q. This document is titled Cancer Incidence

1 among Finnish Workers Exposed to Halogenated
2 Hydrocarbons, correct?

3 A. Yes. It's halogenated. The
4 pronunciation is wrong, but the words are correct.

5 Q. My poor pronunciation aside, this is
6 Anttila 1995 that you reviewed for your kidney
7 cancer report, correct?

8 A. Yes.

9 Q. If you could turn to page 802, do you
10 see Table 3?

11 A. Yes.

12 Q. Table 3 is the observed numbers of
13 cancer cases in standardized incidence rates in
14 1967 to 1992 for selected primary sites with 95
15 percent confidence intervals with workers exposed
16 to trichloroethylene, both genders combined by
17 years since the first measurement. Correct?

18 A. Yes.

19 Q. Do you see the column Whole Period?

20 A. Yes.

21 Q. The standardized incident rate for
22 kidney cancer for the whole period is 0.87,
23 correct?

24 A. You read that correctly on this table.

25 Q. And for bladder cancer, bladder, ureter

1 and urethra cancer for the whole period, the
2 standardized incident rate is 0.82, correct?

3 A. You read that correctly.

4 Q. You can go ahead and set that document
5 aside. If you could turn to page 27 of your kidney
6 cancer report.

7 THE VIDEOGRAPHER: Counsel, I have a
8 Pat Wallace trying to join Zoom. Is that all
9 right?

10 MR. RUZICKA: That's fine.

11 BY MS. SILVERSTEIN:

12 Q. On page 27, this is your discussion of
13 the Bradford Hill framework for PCE kidney cancer,
14 correct?

15 A. Yes, that's correct.

16 Q. And do you see the heading that says
17 "Exposure-Response"?

18 A. Yes.

19 Q. Under "Exposure-Response" you said:
20 "Multiple studies have demonstrated monotonic
21 exposure-response relationships for increased
22 intensity of PCE exposure with increased Kidney
23 cancer. ATSDR 2018, Callahan 2019. Additional
24 evidence of exposure-response occurs with other
25 measures of intensity of exposure. Aschengrau

1 1993, Bove 2014a, Christensen 2013, Purdue 2017,
2 Vlaanderen 2013. Similar results despite varied
3 methods of assessing exposure provide compelling
4 evidence of causation given the exposure-response
5 relationship demonstrated in multiple studies."

6 Did I read that correctly?

7 A. Yes.

8 Q. If we could go back to Exhibit 26 with
9 Aschengrau 1993. If you turn to page 289, back to
10 Table 4. You would agree that Table 4 without
11 latency for kidney cancer shows an -- a crude odds
12 ratio of 1.36 and no result for high exposure,
13 correct?

14 A. Correct. The crude odds ratio in this
15 table for kidney cancer is 1.36 in the low-exposure
16 group, and there were not enough cases in the
17 high-exposure group to analyze.

18 Q. The data reported in Table 4 does not
19 show a monotonic dose-response for kidney cancer,
20 correct?

21 A. Correct, it does not.

22 Q. And can you go back to Exhibit 25 and
23 turn to page 4, which has Table 2. Do you see
24 Table 2?

25 A. Just a moment. Yes, I see Table 2.

1 Q. Do you see the column that says
2 "Kidney"?

3 A. Yes.

4 Q. For kidney cancer and perchloroethylene,
5 the first tier of exposure is 1.11, correct?

6 A. Yes, that's correct.

7 Q. The second tier of exposure is 0.96?

8 A. Yes, that's correct.

9 Q. And the third tier of exposure is 0.94,
10 correct?

11 A. Yes, that's correct.

12 Q. Is this showing a monotonic exposure
13 dose -- sorry -- exposure-response ratio?

14 A. No, it's not.

15 Q. Did you review the ATSDR assessment of
16 the evidence for drinking water contaminants at
17 Camp Lejeune?

18 A. Yes.

19 Q. I am handing you Exhibit 27.

20 THE REPORTER: 28.

21 MS. SILVERSTEIN: 28. Thank you.

22 (Exhibit 28 was marked for
23 identification and is attached to
24 the transcript.)
25

1 BY MS. SILVERSTEIN:

2 Q. I handed you a document titled ATSDR
3 Assessment of the Evidence for the Drinking Water
4 Contaminants at Camp Lejeune and Specific Cancers
5 and Other Diseases, correct?

6 A. Yes, that's correct.

7 Q. This is dated January 13th, 2017?

8 A. Yes, that's correct.

9 Q. And this is the ATSDR assessment of the
10 evidence that you reviewed in forming your
11 opinions, correct?

12 A. Yes, I reviewed that in forming my
13 opinions in developing my report.

14 Q. And you cited it in the -- as support
15 for your opinion that there was an
16 exposure-response relationship but, rather, the
17 discussion of the exposure-response relationship
18 for PCE and kidney cancer, right?

19 MR. RUZICKA: Objection, form.

20 A. I don't believe that's correct, but can
21 you show me where you --

22 Q. That's fine. You reviewed this in
23 forming your opinion as to PCE and kidney cancer,
24 right?

25 A. I reviewed this as one of the materials

1 I reviewed, yeah.

2 Q. Can you go ahead and turn to page 22.

3 MR. RUZICKA: On Exhibit 28?

4 MS. SILVERSTEIN: Yes.

5 BY MS. SILVERSTEIN:

6 Q. Are you on page 22?

7 A. Yes.

8 Q. Do you see the heading "PCE"?

9 A. Yes.

10 Q. And do you see where it says
11 "Conclusion"?

12 A. Yes.

13 Q. Under "Conclusion" it states, "ATSDR
14 concludes that there is below equipoise evidence
15 for causation for PCE and kidney cancer due to the
16 lack of consistency in the findings from the
17 epidemiological studies," correct?

18 A. You read that correctly.

19 Q. I'm going to turn to page 28 of your
20 kidney cancer report. Are you on page 28?

21 A. Yes.

22 Q. Do you see where it says "Summary: PCE"?

23 A. Yes.

24 Q. And do you see where you said
25 "Additionally, the 2017 ATSDR framework is also

1 clearly met: Equipoise and above evidence for
2 causation" and you describe the equipoise and above
3 evidence for causation?

4 A. Yes, I see that.

5 Q. Is it your opinion that there is
6 equipoise and above evidence for causation for PCE
7 and kidney cancer?

8 A. Yes, that's my opinion.

9 Q. And is that true even though ATSDR 2017
10 concluded there was below equipoise evidence for
11 causation?

12 A. Yes, based on my evaluation of the
13 studies themselves.

14 Q. So you disagree with ATSDR's application
15 of their standard?

16 MR. RUZICKA: Objection to form.

17 A. I don't have an opinion on their
18 application. They didn't have access to all the
19 studies that I've reviewed. Their evaluation was
20 done at the beginning of 2017. I've reviewed
21 additional studies since then.

22 Q. So I wanted to take a look at the
23 studies that you reviewed in your Bradford Hill
24 framework for PCE. The studies that I see that are
25 2017 or later that you discuss in your Bradford

1 Hill analysis are Purdue 2017 and Callahan 2019.

2 Is that correct?

3 A. And the ATSDR 2018 study.

4 Q. The public health assessment?

5 A. No.

6 Q. Which 2018 study?

7 A. The Exhibit 15.

8 Q. The morbidity study from Camp Lejeune?

9 A. Yes.

10 Q. And those are the only three studies
11 that you cite that are 2017 or later, correct?

12 A. Let me just confirm, but I believe so.

13 Q. And based on those three studies, is it
14 your opinion that PCE -- that those three studies
15 are not for PCE and kidney cancer's relationship to
16 move from below equipoise to equipoise and above?

17 MR. RUZICKA: Object to the form.

18 A. I don't think that's a fair
19 characterization of my opinion. I evaluated the
20 evidence independently and came to that conclusion
21 based on my evaluation of the evidence.

22 Q. But you agree that your conclusion
23 differs from ATSDR's 2017's conclusion, correct?

24 A. It differs from the ATSDR conclusion
25 that's published in the January 2017 assessment of

1 the evidence.

2 Q. In your section on PCE and kidney
3 cancer, you didn't cite GJI 2005, correct?

4 A. Not that I recall.

5 Q. In your analysis of PCE and kidney
6 cancer, you didn't cite Pukkala, P-u-k-k-a-l-a
7 2009, correct?

8 A. I don't recall. I would have to review
9 to confirm that.

10 Q. It's not cited in your report in your
11 discussion of PCE and kidney cancer, correct?

12 A. I don't believe so. As I sit here, I
13 don't recall that, but I would have to review
14 everything to confirm, so...

15 Q. In your section on PCE and kidney
16 cancer, you didn't cite Selden and Olburg, Jr.,
17 2011, correct?

18 A. Not that I recall.

19 Q. And in your section on PCE and kidney
20 cancer you didn't cite Asal, A-s-a-l, 1988,
21 correct?

22 A. Not that I recall.

23 Q. I want to turn now to page 29 of your
24 kidney cancer report where it says exposure on
25 benzene. Do you see that?

1 A. Yes.

2 Q. And this is where you discuss your
3 discussion of the relationship between kidney
4 cancer and benzene, right?

5 A. Yes.

6 Q. You would agree that there is a lack of
7 analogous evidence to support benzene as a cause of
8 kidney cancer, right?

9 MR. RUZICKA: Objection, form.

10 A. I think I state that explicitly on
11 page 32.

12 Q. Which means that you'd agree that
13 currently there is lack of analogous evidence to
14 support benzene as a cause of kidney cancer, right?

15 A. Yes. I'm not sure how to answer that
16 differently because I just confirmed the statement
17 you stated --

18 Q. Sure.

19 A. -- and said I wrote it on page 32.

20 Q. Right. Do you agree with the statement
21 that you made? Is that still your opinion?

22 A. Yes. As I think -- I think as I stated
23 earlier in the deposition, I haven't changed my
24 opinions.

25 Q. And if you look to page 32 under

1 "Biological Plausibility," do you see that?

2 A. Yes.

3 Q. You wrote, "Research is lacking to
4 elucidate the full pathway for exposure to benzene
5 in development of kidney cancer." Did I read that
6 correctly?

7 A. Yes.

8 Q. You then say, "However, given that
9 benzene is a known human carcinogen and that
10 benzene is characterized as a known human
11 carcinogen for all routes of exposure based upon
12 convincing human evidence as well as supporting
13 evidence from animal studies, it is scientifically
14 reasonable to conclude that there is a biologically
15 plausible mechanistic pathway for benzene to cause
16 kidney cancer."

17 Did I read that correctly?

18 A. Yes.

19 Q. Is it your opinion that if a chemical,
20 it can cause cancer in one target organ, that means
21 that there is a biological pathway for any target
22 organ?

23 MR. RUZICKA: Objection to form.

24 A. No, not necessarily.

25 Q. And you don't have any information about

1 a biologically plausible mechanistic pathway
2 specific to benzene and kidney cancer, do you?

3 A. I don't think there has been evidence
4 for or against a pathway for benzene to cause
5 kidney cancer. I think there is just a hole in the
6 scientific knowledge where we don't -- we haven't
7 worked out any -- where we haven't evaluated, using
8 "we" as scientists, have not evaluated a possible
9 mechanism for that to occur.

10 Q. So that means that you agree that the
11 scientific evidence can't tell us what the
12 possible -- the plausible biological mechanism for
13 benzene to cause kidney cancer is, correct?

14 MR. RUZICKA: Objection to form.

15 A. I think we know benzene potentially
16 damages DNA, but we do not know how it specifically
17 would -- the full -- we have not elucidated the
18 full set of steps that would lead to kidney cancer.

19 Q. One of the studies that you -- excuse
20 me. One of the studies that you discuss as
21 supporting an association between benzene and
22 kidney cancer is Gerin 1998, right?

23 A. Yes.

24 Q. And you cite that under strength of
25 association, consistency and exposure response,

1 right?

2 A. Yes. I cite it in all three sections.

3 Q. I am handing you Exhibit 29, I believe.

4 (Exhibit 29 was marked for
5 identification and is attached to
6 the transcript.)

7 BY MS. SILVERSTEIN:

8 Q. The document I just handed you is titled
9 Associations Between Several Sites of Cancer and
10 Occupational Exposure to Benzene, Toluene, Xylene,
11 and Styrene: Results of a Case-Control study in
12 Montreal, correct?

13 A. Aside from it's toluene, the
14 pronunciation of toluene, but you read the words
15 correctly.

16 Q. So aside from my poor pronunciation
17 skills, that's the title of this article, right?

18 A. Yes, that's correct.

19 Q. And this is Gerin 1998 that you cite in
20 your kidney cancer report, correct?

21 A. Yes.

22 Q. So I want to turn to page 155 of this
23 study. In the right-hand column, the paragraph
24 above "Acknowledgments," do you see that?

25 A. Yes.

1 Q. It says, "In conclusion, for 15 common
2 cancer types, not including leukemia, our study
3 does not provide persuasive evidence of an
4 increased risk that could be related directly to
5 occupational exposure to benzene, toluene, xylene
6 or styrene, correct?

7 A. Yes, you read that correctly.

8 Q. In your kidney cancer report -- you can
9 set that document aside.

10 On page 8 of your kidney cancer
11 report --

12 A. Yes, I'm on page 8.

13 Q. Do you see where it says "Hadnot Point"
14 and then it has a series of the bullet points?

15 A. Yes.

16 Q. On the third point is benzene, correct?

17 A. Yes.

18 Q. It says, "Benzene contamination of at
19 least 0.1 parts per billion was estimated beginning
20 in the 1950s with a peak concentration of 12 parts
21 per billion in 1984. A measure of 2500 parts per
22 billion was reported in 1985. The median exposure
23 to benzene from April 1973 to January 1985 was 4.1
24 micrograms per liter a month and from 1975 to 1985
25 was 4.6 micrograms per liter a month."

1 Did I read that correctly?

2 A. Yes, you read that correctly.

3 Q. Is it your opinion that exposure to the
4 4.1 or 4.6 micrograms per liter a month that you
5 identify here as the median exposure is
6 sufficiently hazardous to human health to cause
7 kidney cancer?

8 MR. RUZICKA: Objection, form.

9 A. I think I identify on page 39 levels of
10 benzene at Camp Lejeune that have been directly
11 associated with kidney cancer. These are people
12 who were exposed at Camp Lejeune to levels of
13 benzene in the low-exposure group of 2 to 45
14 micrograms per liter a month and had an elevated
15 measure of association with kidney cancer, and that
16 median exposure falls within that range. In
17 addition, exposures of at least the median were
18 also associated with kidney cancer.

19 Q. So is it your opinion then that the low
20 exposure group that you discuss on page 39 of 2 to
21 40 gram -- excuse me -- 2 to 45 micrograms per
22 liter a month is sufficiently hazardous to human
23 health so to cause kidney cancer?

24 MR. RUZICKA: Objection, form.

25 A. I think I have just stated that in

1 people who were at Camp Lejeune and were exposed to
2 that amount of benzene, they had elevated rates of
3 kidney cancer. I don't know how more direct
4 evidence you can get than evaluating the people who
5 were actually exposed.

6 Q. I am handing you Exhibit 30, I think,
7 and this is the chapter.

8 (Exhibit 30 was marked for
9 identification and is attached to
10 the transcript.)

11 BY MS. SILVERSTEIN:

12 Q. I just handed you the 2007 toxicological
13 profile for benzene, correct?

14 A. Yes.

15 Q. And this is an ATSDR tox profile,
16 correct?

17 A. Yes, that's correct.

18 Q. Are you familiar with ATSDR's
19 toxicological profiles for -- are you familiar with
20 ATSDR's toxicological profile for benzene?

21 A. I don't recall if I cited this in my
22 report.

23 Q. Sure. I think my question was a little
24 broader. Are you familiar with this document,
25 whether or not you cited it in your report?

1 A. I have reviewed it at some point. I
2 don't recall whether I reviewed it specifically in
3 developing my report or not, though.

4 Q. Okay. But you have reviewed it at some
5 point?

6 A. At some point, yes.

7 Q. If you turn to page 272, do you see
8 Table 6-3 titled Benzene in Food?

9 A. Yes, I see that.

10 Q. And one, two, three, four -- five lines
11 down do you see "banana," comma, "raw"?

12 A. Yes, I see that.

13 Q. And so this table shows that a
14 concentration minimum to maximum in parts per
15 billion in raw bananas was between 11 parts per
16 billion and 132 parts per billion, right?

17 MR. RUZICKA: Objection, form.

18 A. That's what this table states, yes
19 credit.

20 Q. And do you see about midway down the
21 table where it says, "Cola, carbonated"?

22 A. Yes, I see that.

23 Q. And do you see that it shows that the
24 concentration minimum, maximum for cola carbonated
25 was between 1 and 138 parts per billion?

1 A. Yes, you read that correctly.

2 Q. And then two lines down from that do you
3 see coleslaw with dressing?

4 A. Yes, I see that.

5 Q. And do you see where it shows that the
6 concentration minimum, maximum for coleslaw with
7 dressing is 11 to 102 parts per billion?

8 A. Yes, I see that.

9 Q. Go ahead and turn back one page to page
10 271. Are you on page 271?

11 A. Yes.

12 Q. Do you see the Section 6.4.4, Other
13 Environmental Media?

14 A. Yes.

15 Q. Do you see where in the first line it
16 says, "Eggs had the highest concentrations, 2,100
17 parts per billion uncooked and 500 to 1,000 parts
18 per billion hard boiled"?

19 A. Yes, I see that.

20 Q. Should we be concerned about the level
21 of benzene in these foods, meaning bananas,
22 carbonated cola, coleslaw with dressing or eggs?

23 MR. RUZICKA: Objection, form. It is
24 not within the purview of his -- you are
25 asking an improper question for an expert

1 witness.

2 BY MS. SILVERSTEIN:

3 Q. Dr. Hatten, I will ask the question
4 again and you can answer it. Should we be
5 concerned about the level of benzene in food,
6 specifically in raw bananas, carbonated cola,
7 coleslaw with dressing or eggs?

8 MR. RUZICKA: Objection to form. It
9 is not within the purview of his general
10 causation report. It's not offering opinions
11 on the opinion you just asked him to offer.

12 BY MS. SILVERSTEIN:

13 Q. Dr. Hatten, you can answer the question.

14 A. Is there a specific concern you are
15 asking about?

16 Q. Should we be worried that we are going
17 to get kidney cancer or bladder cancer from the
18 benzene in hard-boiled eggs?

19 MR. RUZICKA: Objection, form.

20 A. I don't know. I haven't evaluated the
21 evidence surrounding diet and benzene. I will say
22 none of these foods are things that people drink
23 all day or bathe in or shower in or anything like
24 that, so the exposures are very, very different.

25 I haven't evaluated this body of

1 evidence enough to form an opinion with respect to
2 diet and kidney or bladder cancer in the general
3 public.

4 Q. So looking at the concentrations of
5 benzene, you can't tell us whether you have an
6 opinion that any of these foods, that we should be
7 concerned about the level of benzene in these
8 foods?

9 MR. RUZICKA: Objection to form.

10 A. With respect to kidney and bladder
11 cancer, I don't have an opinion at the moment. I
12 would have to review the literature and provide an
13 informed opinion.

14 Q. In your kidney cancer report on page
15 31 -- are you on page 31?

16 A. Yes, I am.

17 Q. And there you are discussing strength of
18 association on page 31, correct?

19 A. Yes.

20 Q. And in that section you say these range
21 up to an odds ratio of 4.29 and cite Greenland
22 1994. Correct?

23 A. Correct.

24 Q. I'm handing you Exhibit 31.

25 (Exhibit 31 was marked for

1 identification and is attached to
2 the transcript.)

3 BY MS. SILVERSTEIN:

4 Q. Would it be fair to say that since you
5 cite Greenland in your kidney cancer report, you
6 generally find it to be a reliable study?

7 A. I would consider it an informative study
8 that is methodologically sound.

9 Q. Would you turn to page 52. The odds
10 ratio that you cited in your kidney cancer report
11 of 4.29, does that come from Table 3?

12 A. Yes, that's correct.

13 Q. And you would agree that in Table 3 the
14 odds ratio reported for benzene and bladder cancer
15 is 1.02, correct?

16 A. Yes, that's correct.

17 Q. And you wouldn't generally consider that
18 to be an elevated measure of association, correct?

19 A. No. I think, as I've stated a few times
20 previously, it's a positive measure of association,
21 but I would not typically consider it an elevated
22 measure of association.

23 Q. And I want to look at Table 4. Table 4
24 reports the odds ratio for TCE, correct?

25 A. Correct, using -- it's a slightly

1 different analysis, but it is for TCE.

2 Q. And for a kidney cancer the reported
3 odds ratio for kidney cancer and TCE is 0.99,
4 correct?

5 A. Using this analysis in Table 4, this
6 presented in Table 4.

7 Q. And for bladder cancer the reported odds
8 ratio in Table 4 for TCE is 0.85, correct?

9 A. In Table 4 it is reported as 0.85.

10 Q. You can go ahead and set that document
11 aside.

12 In your section on kidney cancer and
13 benzene, you don't cite the study Dagg, D-a-g-g,
14 1992, correct?

15 A. Not that I recall.

16 Q. And you don't cite Honda 1995?

17 A. Not that I recall.

18 Q. I don't cite Collingwood 1996, correct?

19 A. I believe so.

20 Q. You don't cite in the section on PCE and
21 kidney cancer Divine 1999, right?

22 A. I don't believe so.

23 Q. In your section of benzene and kidney
24 cancer you don't cite Wong 2001, correct?

25 A. I don't believe I cite Wong 2001.

1 Q. And in your section on benzene and
2 kidney cancer you don't cite Tsai, T-s-a-i 2007,
3 correct?

4 A. I don't believe I cite Tsai 2007.

5 Q. I want to next turn to your section on
6 vinyl chloride and kidney cancer, which starts on
7 page 33.

8 A. Okay.

9 Q. You would agree that there is a lot of
10 analogous evidence to support vinyl chloride as a
11 cause of kidney cancer, right?

12 A. I think as I state on page 35 under
13 "Analogy," currently there is a lack of analogous
14 evidence to support vinyl chloride as a cause of
15 kidney cancer.

16 Q. And you agree that research is lacking
17 to elucidate the full pathway for exposure to vinyl
18 chloride right and development of kidney cancer,
19 correct?

20 A. Correct, and I think you were reading
21 directly from my report. Those opinions haven't
22 changed.

23 Q. In that section on biological
24 plausibility for vinyl chloride and kidney cancer,
25 you refer to an IARC statement, correct?

1 A. Yes.

2 Q. I apologize again for the large
3 document. This one is in a binder, but if it is
4 easier for you to review it out of the binder,
5 that's, of course, fine.

6 I believe this is Exhibit 32, and I'm
7 handing you the chapter.

8 (Exhibit 32 was marked for
9 identification and is attached to
10 the transcript.)

11 BY MS. SILVERSTEIN:

12 Q. I handed you the IARC profile for vinyl
13 chloride and a couple other constituents from 2008,
14 correct?

15 A. Yes.

16 Q. And have you reviewed this document
17 before?

18 A. Yes.

19 Q. If you could turn to page 425. Are you
20 on page 425?

21 A. Yes.

22 Q. Here it says Section 6.1,
23 Carcinogenicity in Humans. Do you see where I'm
24 looking?

25 A. Yes.

1 Q. And it says, "There is sufficient
2 evidence in humans for the carcinogenicity of vinyl
3 chloride. Vinyl chloride causes angiosarcomas of
4 the liver and hepatocellular carcinoma." Excuse me.

5 Did I read that correctly?

6 A. The pronunciation is not correct, but it
7 is hepatocellular carcinomas, but you read the
8 words correctly.

9 Q. And if you then turn to page 31, on page
10 31 there is a section titled "6. Evaluation and
11 Rationale." Do you see that?

12 A. Yes.

13 Q. And under Section (a), Carcinogenicity
14 in Humans, there is a subheading, Sufficient
15 Evidence of Carcinogenicity, correct?

16 A. Yes.

17 Q. The last sentence in -- under
18 "Sufficient Evidence of Carcinogenicity" states,
19 "A statement that there is sufficient evidence is
20 followed by a separate sentence that identifies the
21 target organs or tissues where an increased risk of
22 cancer was observed in humans. Identification of a
23 specific target organ or tissue does not preclude
24 the possibility that the agent may cause cancer at
25 other sites."

1 Did I read that correctly?

2 A. Yes, you read it correctly.

3 Q. And the target organ or tissue
4 identified for vinyl chloride does not include the
5 kidney or bladder, correct?

6 A. In -- I guess there are two answers.
7 One is in this IARC Monograph the tissues that were
8 sufficient evidence of carcinogenicity as
9 identified by IARC are hepatocellular carcinomas
10 and angiosarcomas.

11 In addition, there are cases that the
12 specific types of bladder tumors that have been
13 associated with vinyl chloride, it's a very rare
14 and specific subtype. When we talked about
15 specificity earlier, it's a vascular-type tumor
16 that is similar to angiosarcomas in the liver, but
17 they are very rare, and so only limited reports
18 have been performed about those. But those have
19 been found in association with vinyl chloride as
20 kind of a separate type of tumor that's not renal
21 cell carcinoma or clear cell or papillary cell that
22 we have typically been discussing -- or, sorry, in
23 the context of kidney cancer or in the context of
24 bladder cancer with squamous cell carcinoma of the
25 bladder, so...

1 Q. Okay. So you said a couple of things I
2 want to make sure I'm understanding correctly.

3 The first is that you agree that the --
4 in this IARC Monograph the cancer identified as
5 having sufficient evidence of carcinogenicity, that
6 doesn't include renal cell carcinoma or bladder
7 cancer, correct?

8 A. Not in this IARC Monograph.

9 Q. And then you said that there -- vinyl
10 chloride has been associated with a very specific
11 rare type of bladder cancer, right?

12 A. Correct.

13 Q. What type of bladder cancer is that?

14 A. It's an angio -- I don't recall the
15 specific name, but it is a vascular tumor of the
16 bladder that's similar to angiosarcomas in the
17 liver. It's very rare and there are very limited
18 reports of those, but that has been explicitly
19 identified where the only real exposure has been to
20 vinyl chloride and it shows up in people with high
21 exposures or with confirmed exposures of vinyl
22 chloride.

23 Q. Okay. Did you analyze that specific
24 type of cancer separately in your bladder cancer
25 report?

1 A. I reviewed some of the literature on it,
2 but it was limited to -- it was very limited
3 literature and did not feel like it was -- even
4 though it was clearly linked to vinyl chloride, it
5 was primarily case series and couldn't provide
6 epidemiologic evidence with respect to vinyl
7 chloride as a cause of that. So I did not analyze
8 that separately in my report.

9 Q. In your section on vinyl chloride and
10 kidney cancer, you didn't cite Carreon,
11 C-a-r-r-e-o-n, 2013, correct?

12 A. Not that I'm aware of.

13 MS. SILVERSTEIN: And you can set that
14 binder aside.

15 And I want to turn to -- I think
16 before we move to the bladder cancer report we
17 should take a short break.

18 MR. RUZICKA: Okay.

19 THE VIDEOGRAPHER: The time is
20 3:07 p.m. We are off the record.

21 (Recess taken.)

22 THE VIDEOGRAPHER: The time is
23 3:15 p.m. We are back on the record.

24 BY MS. SILVERSTEIN:

25 Q. Dr. Hatten, did you discuss the

1 substance of your testimony with anybody on the
2 break?

3 A. No.

4 Q. I want to turn and talk about your
5 bladder cancer report that's Exhibit 7. Do you
6 have Exhibit 7?

7 A. Yes.

8 Q. And could you turn to page 38.

9 A. Could you repeat that?

10 Q. Could you turn to page 38.

11 Are you on page 38?

12 A. Yes.

13 Q. Do you see the heading "Animal Studies"?

14 A. Yes.

15 Q. Do you agree that there are no published
16 animal studies that identify excess cases of
17 bladder cancer, correct?

18 A. Correct. That's what I state in the
19 first sentence on page 38.

20 Q. Can you turn to Exhibit 28, and can you
21 turn to page 95, please.

22 Are you on page 95?

23 A. Yes.

24 Q. Do you see the heading "TCE"?

25 A. Yes.

1 Q. ATSDR's conclusion is that there is
2 below equipoise evidence for causation for TCE and
3 bladder cancer, correct?

4 A. Yes, and I see that, and you read -- or
5 you read that correctly.

6 Q. And you disagree with ATSDR's
7 conclusion?

8 MR. RUZICKA: Objection to form.

9 A. I think as we talked about earlier with
10 kidney cancer, I have evaluated the evidence
11 independently and came to my own conclusion, but I
12 believe there is sufficient evidence to identify
13 TCE as a cause of bladder cancer.

14 Q. Okay. So to make sure I'm understanding
15 correctly, I understand that you did your own
16 independent analysis, and the results of your
17 independent analysis of TCE and bladder cancer are
18 different than the ATSDR's results, correct?

19 A. The results they published in 2017,
20 correct.

21 Q. And if you'll turn to page 25 of your
22 bladder cancer report.

23 Are you on page 25?

24 A. Yes.

25 Q. And do you see at the bottom where you

1 say, "Additionally, the 2017 ATSDR framework is
2 also clearly met"?

3 A. Yes.

4 Q. And in that section you are applying the
5 ATSDR framework that is discussed in Exhibit 28,
6 correct?

7 A. Correct. I'm utilizing the same
8 framework the ATSDR used in the 2017 report.

9 Q. Your section on TCE and bladder cancer
10 goes from pages 21 to 26, right?

11 A. Correct.

12 Q. And in that section on TCE and bladder
13 cancer, you didn't cite Shannon 1988, correct?

14 A. I would have to look to confirm, but I
15 don't believe so.

16 Q. And in that section on TCE and bladder
17 cancer, you didn't cite Sung 2007, correct?

18 A. I would have to review my report again
19 to confirm, but I don't believe so.

20 Q. In that section on TCE and bladder
21 cancer, you didn't cite Pukkala, P-u-k-k-a-l-a,
22 2009, correct?

23 MR. RUZICKA: What was the year?

24 MS. SILVERSTEIN: 2009.

25 A. I don't believe so.

1 Q. In your section on TCE and bladder
2 cancer you didn't cite Pesch, P-e-s-c-h, 2000,
3 correct?

4 A. I don't believe so.

5 Q. I want to turn to your discussion of PCE
6 and kidney cancer.

7 A. Are we coming back to this, or should I
8 leave it out?

9 Q. Yeah, you can go ahead and leave that
10 section out.

11 Your discussion of PCE and bladder
12 cancer begins on your report page 15, correct?

13 A. Yes, that's correct.

14 Q. Turning to page 18 of your bladder
15 cancer report, you cite Vlaanderen 2014, correct?

16 A. Yes.

17 Q. And that's the only meta-analysis you
18 cite, right?

19 A. Yes, that's correct.

20 Q. And Vlaanderen 2014 used dry cleaners as
21 a proxy for PCE exposure, correct?

22 A. That was one of the analyses.

23 Q. If you look at page 19 you -- page 19
24 includes your discussion of the Bradford Hill
25 framework for PCE and bladder cancer, correct?

1 A. Yes, that's correct.

2 Q. And at the bottom of page 19 you are
3 discussing biological plausibility, right?

4 A. Yes.

5 Q. And you say it is plausible that bladder
6 cancer follows a similar causal pathway given that
7 urine formed in the kidney travels to the bladder
8 where it dwells until urination. Correct?

9 A. Yes, that's correct.

10 Q. And you say that it's plausible. Is
11 that the correct language?

12 A. Yes. I use that specific language in my
13 report on page 19.

14 Q. In the next sentence you say this
15 provides clear support for a biologically plausible
16 pathway. Is that correct?

17 A. Correct, that's the language I used.

18 Q. Was it your opinion that plausibility --
19 that if something is plausible that's clear
20 support?

21 MR. RUZICKA: Objection to form.

22 A. No. What I think I am pointing out is
23 that there is a clear mechanism for causation of
24 kidney cancer following PCE metabolism. There is
25 not -- there a lack of evidence determining whether

1 that same mechanism occurs for bladder cancer and
2 but it is physiologically correct that urine is
3 produced in the kidney and then dwells in your
4 bladder.

5 There is also a large body of evidence
6 suggesting that, for example, infrequent urination
7 with exposure to toxins is associated with
8 increased risks of bladder cancer and that longer
9 dwell times potential -- or have been associated
10 with bladder cancer.

11 All of those steps have not clearly been
12 linked with respect to bladder cancer at this
13 point, though. So we have a clear pathway through
14 kidney cancer and we know what metabolites.
15 Physiologically it is plausible for that to occur
16 in the bladder, but there is just a lack of
17 evidence confirming or refuting that.

18 Q. Does that mean that there is a lack of
19 evidence showing whether or not that pathway is a
20 biologically plausible mechanism to cause bladder
21 cancer, correct?

22 MR. RUZICKA: Objection, form.

23 A. There is a lack of confirmation, I
24 think, in the science. It's a plausible pathway.
25 It has just not been fully studied in science. So

1 that last step, the kidney-to-bladder exposure
2 pathway has not been fully evaluated in science.

3 Q. On page 17 at the bottom, the last
4 paragraph, you say, "A population matched
5 case-control study examining occupational exposures
6 and bladder cancer demonstrated a statistically
7 significant elevated measure of association hazard
8 ratio 1.12 with medium PCE exposure and a 10-year
9 latency. Hadkhale 2017." Correct?

10 A. Yes, you read that correctly.

11 Q. I'm handing you what I think is
12 Exhibit 33.

13 (Exhibit 33 was marked for
14 identification and is attached to
15 the transcript.)

16 BY MS. SILVERSTEIN:

17 Q. I handed you Exhibit 33, which is titled
18 Occupational exposure to solvents and bladder
19 cancer: A population-based case control study in
20 Nordic countries. Do you see that?

21 A. Yes.

22 Q. And this is the study that you are
23 referring to when discussing Hadkhale 2017,
24 correct?

25 A. Yes.

1 Q. In your report when you talk about the
2 hazard ratio of 1.12 for medium exposure with a
3 10-year latency, are you referring to Table 3?

4 A. I believe that is the correct table.
5 I would have to review the entire paper to ensure
6 that there is not another place that I might have
7 been referring to.

8 Q. You would agree that in Table 3 under
9 perchloroethylene the hazard ratio for exposure,
10 13.60 to 87.55 parts per million years, has a
11 hazard ratio of 1.12, correct?

12 A. Correct. It's a hazard ratio of 1.12 on
13 Table 3.

14 Q. You would agree that Table 3 for an
15 exposure of 13 -- less than 13.60 parts per million
16 years, the hazard ratio is 1.00, correct?

17 A. Yes, in Table 3, that is correct.

18 Q. And that doesn't show a positive
19 association, correct?

20 A. Yes, you are correct, that that does not
21 demonstrate a positive association.

22 Q. And it also doesn't demonstrate an
23 elevated measure of association, right?

24 A. Yes, that is correct.

25 Q. In Table 3 under perchloroethylene for

1 the more than 87.55 parts per million years, it
2 shows a hazard ratio of 0.94 correct?

3 A. Yes, that's correct.

4 Q. You would agree that that doesn't show a
5 positive measure of association, right?

6 A. Correct, that does not demonstrate a
7 positive measure of association.

8 Q. And you would agree that Table 3 also
9 doesn't show a monotonic dose-response trend,
10 correct?

11 A. Correct. Table 3 does not show a
12 monotonic dose-response for PCE in Table 3 of this
13 study.

14 Q. In your section on PCE and bladder
15 cancer, you rely on an NTP 2021 monograph, correct?

16 A. I reviewed that monograph when I was
17 developing my opinions.

18 Q. I am handing you Exhibit 34.

19 (Exhibit 34 was marked for
20 identification and is attached to
21 the transcript.)

22 BY MS. SILVERSTEIN:

23 Q. This is an NTP monograph on
24 trichloroethylene, correct?

25 A. Correct.

1 Q. You would agree that this NTP monograph
2 doesn't discuss bladder cancer, right?

3 A. I would have to review the entire thing
4 to tell you whether there is any mention of bladder
5 cancer in here. I don't believe it's the focus of
6 this monograph, though.

7 Q. This monograph focuses on kidney cancer,
8 non-Hodgkin's lymphoma and liver cancer, correct?

9 MR. RUZICKA: Objection, form.

10 A. Those are the primary outcomes that are
11 evaluated in this monograph.

12 Q. You can go ahead and set that document
13 aside.

14 In your section on PCE and bladder
15 cancer you didn't cite the study Travier,
16 T-r-a-v-i-e-r, 2002, correct?

17 A. I don't believe so, but I would have to
18 review the entire report to confirm.

19 Q. Your section on PCE and bladder cancer
20 is pages 15 through the top of 21, correct?

21 A. Yes, that's correct.

22 Q. For PCE and bladder cancer, you didn't
23 cite Chang 2003, correct?

24 A. I don't believe so, but I would have to
25 review the entire report to be certain.

1 Q. For PCE and bladder cancer you didn't
2 cite Sung 2007, right?

3 A. I don't believe so, but again, I would
4 have to review the entire thing to confirm.

5 Q. For PCE and bladder cancer you didn't
6 cite Pukkala, P-u-k-k-a-l-a, 2009, correct?

7 A. I don't believe so, but again, I would
8 have to review the entire report to confirm.

9 Q. For PCE and bladder cancer you didn't
10 cite Selden and Olburg, Jr., 2011, right?

11 A. Again, I don't believe so, but I would
12 have to review the entire report to confirm.

13 Q. And for PCE and bladder cancer you
14 didn't cite Burns and Swanson 1991, correct?

15 A. Again, I don't believe so, but I would
16 have to review the entire report to confirm.

17 Q. For PCE and bladder cancer you didn't
18 cite the study Colt 2011, right?

19 A. I don't believe so, but I would have to
20 review the entire report to confirm.

21 Q. Your section on benzene and bladder
22 cancer begins on page 26, correct?

23 A. Yes, that's correct.

24 Q. You agree that there is a lack of
25 analogous evidence to support benzene as a cause of

1 bladder cancer, correct?

2 A. I think on page 30 I state currently
3 there is a lack of analogous evidence to support
4 benzene as a cause of bladder cancer, and I haven't
5 changed that opinion.

6 Q. I want to go back to Exhibit 28. ATSDR
7 2017. Do you still have that document?

8 If you could turn to page 95.

9 Are you on page 95?

10 A. Yes.

11 Q. In the bottom section do you see "Vinyl
12 Chloride and Benzene"?

13 A. Yes.

14 Q. That section says, "Two studies
15 evaluated benzene exposure and bladder cancer with
16 mixed results. One study evaluated vinyl chloride
17 exposure and bladder cancer. Given the paucity of
18 epidemiological studies, there is insufficient
19 information to determine whether an association
20 exists for either vinyl chloride or benzene and
21 bladder cancer. Therefore, ATSDR concludes that
22 for vinyl chloride and benzene there is below
23 equipoise evidence for causation for bladder
24 cancer," correct?

25 A. You read that paragraph correctly.

1 Q. In your report on page 30, your bladder
2 cancer report, you state that additionally, the
3 2017 ATSDR framework is also clearly met and then
4 provide the definition for equipoise and above
5 evidence for causation, correct?

6 A. Yes, at the bottom of page 30 and the
7 top of page 31.

8 Q. So in applying the same 2017 ATSDR
9 framework that's applied in Exhibit 28, you came to
10 a different conclusion than ATSDR, right?

11 A. ATSDR's opinion or analysis was
12 published in 2017. My current analysis reached a
13 different conclusion when I performed it
14 independently.

15 Q. In your section on benzene and bladder
16 cancer, you cite Sciannamero 2019 -- I apologize if
17 I pronounced that incorrectly -- on page 28, right?

18 A. Yes.

19 Q. And you agree that Sciannamero 2019
20 found no elevated measure of association with ever
21 exposed to benzene, correct?

22 A. Correct that I state no elevated measure
23 of association, odds ratio 0.99, with ever exposure
24 to benzene was identified.

25 Q. You also cite Xie, X-i-e, 2024, correct?

1 A. On page 28 I cite that study.

2 Q. I'm handing you Exhibit 35.

3 (Exhibit 35 was marked for
4 identification and is attached to
5 the transcript.)

6 BY MS. SILVERSTEIN:

7 Q. I handed you a study titled Occupational
8 exposure to organic solvents and risk of bladder
9 cancer, correct?

10 A. Yes.

11 Q. This is Xie 2024, correct?

12 A. Yes, that's correct.

13 Q. Can you turn to page 548 of that study.

14 A. Which page?

15 Q. Turn to Table 2, which is 553.

16 You agree that Table 2 is where the
17 ever-exposed odds ratio for benzene and bladder
18 cancer is 1.63, correct?

19 A. In Table 2 there is a analysis that
20 identifies an odds ratio of 1.63 for ever exposure
21 to benzene.

22 Q. You would agree that Table 2 also
23 reports results for ever-exposed odd ratios for
24 bladder cancer and perchloroethylene, right?

25 A. Yes, it reports that as well at 0.36.

1 Q. And that reported odds ratio of 0.36,
2 that's not an elevated level of association,
3 correct?

4 A. Correct, that is not an elevated measure
5 of association.

6 Q. And you would agree that the left-hand
7 column in Table 2 has a row for trichloroethylene,
8 right?

9 A. Yes, it has a row for trichloroethylene.

10 Q. You agree that no -- that Table 2
11 reports no results for trichloroethylene, correct?

12 A. Correct. There is a lack of cases or
13 controls that were exposed to trichloroethylene.

14 Q. And you don't cite Xie 2024 in your
15 discussion for TCE exposures, do you?

16 A. I can look, but I doubt if there were no
17 cases or controls analyzed.

18 Let me confirm that.

19 I don't believe I cite that in my CTE
20 section of my bladder cancer report.

21 Q. Okay. And in your section on bladder
22 cancer and benzene you don't cite Dagg 1992,
23 correct?

24 A. I don't believe so, but I would have to
25 review the entire report to confirm.

1 Q. In your section on bladder cancer and
2 benzene, you don't cite Honda 1995, correct?

3 A. I don't believe so, but I would have to
4 review the entire report to confirm.

5 Q. In your section on benzene and bladder
6 cancer, you don't cite Collingwood 1996, correct?

7 A. I don't believe so, but I would have to
8 review the entire report to confirm.

9 Q. In your section on benzene and bladder
10 cancer you don't cite Satin 1996, correct?

11 A. I don't believe so, but I would have to
12 review the entire report to confirm.

13 Q. In your section on benzene and bladder
14 cancer you don't cite Consonni, C-o-n-s-o-n-n-i,
15 1999, correct?

16 A. Again, I don't believe so, but I would
17 have to review the entire report to confirm.

18 Q. You also don't cite Wong 2001 in your
19 section on benzene and bladder cancer, right?

20 A. I don't believe I cite Wong 2001, but
21 again, I would have to review the entire report to
22 confirm.

23 Q. You also don't cite Tsai 2003, so
24 T-s-a-i?

25 A. I don't believe so, but I would have to

1 review the entire report to confirm that.

2 Q. In your section on benzene and bladder
3 cancer you don't cite Heubner 2004, right?

4 A. I don't believe so, but I would have to
5 review the entire report to confirm.

6 Q. And in your section on benzene and
7 bladder cancer you also don't cite Tsai, T-s-a-i,
8 2007, right?

9 A. I don't believe so, but I would have to
10 review the entire report to confirm.

11 Q. If you could turn to page 31, please.
12 You are on page 31?

13 A. Yes.

14 Q. Do you see the section Exposure: Vinyl
15 Chloride?

16 A. Yes.

17 Q. This is where you begin your discussion
18 on vinyl chloride and bladder cancer, right?

19 A. Yes, that's correct.

20 Q. There is a subheading, Cohort Studies.
21 Do you see that?

22 A. Yes.

23 Q. And here you identify, it looks like,
24 three cohort studies: Mundt 2000, Mundt 2017 and
25 Bove 2014a?

1 A. That's correct.

2 Q. You didn't identify Teta, T-e-t-a, 1990,
3 correct?

4 A. I did not report that or analyze that in
5 my report.

6 Q. You didn't identify any case-control
7 studies, right?

8 A. I did not in my report.

9 Q. Did you identify case-control studies
10 that you didn't discuss in your report?

11 A. Not that I'm aware of.

12 Q. You didn't identify any meta-analyses,
13 right?

14 A. Correct, I did not identify any
15 meta-analyses.

16 Q. Go ahead and turn to page 32. Do you
17 see the bolded heading "Consistency"?

18 A. Yes.

19 Q. You said, "Multiple cohort studies in
20 different populations demonstrate elevated measures
21 of association, Bove 2014a, Mundt, 2017. This
22 provides limited but consistent evidence that vinyl
23 chloride is a cause of bladder cancer."

24 Did I read that correctly?

25 A. Yes.

1 Q. So you agree this is limited evidence?

2 A. I think I stated this provides limited
3 but consistent evidence that vinyl chloride is a
4 cause of bladder cancer, and I haven't changed my
5 opinion since I wrote this report.

6 Q. You agree that Bove 2014a didn't show an
7 overall association with bladder cancer deaths in a
8 10-year lagged analysis, correct?

9 A. Correct, and there was not a -- or as I
10 stated on page 31, there's no overall association
11 with bladder cancer deaths that was identified in a
12 10-year lagged analysis of military personnel
13 stationed at Camp Lejeune compared to Camp
14 Pendleton with at least low exposure to vinyl
15 chloride.

16 Q. You would agree that a over -- a finding
17 of no overall association conflicts with
18 consistency, correct?

19 MR. RUZICKA: Objection, form. You
20 can answer.

21 A. I think it depends on how you -- how you
22 analyze or how you evaluate the data. It's also
23 important to recognize particularly for military
24 personnel, they're overwhelmingly very, very young,
25 and it's unlikely for a disease that occurs most

1 often in older people that you are going to see a
2 large effect size when you do an analysis after a
3 relatively short period of time after an exposure.

4 So I wouldn't say that it conflicts;
5 it's just not providing additional supportive
6 evidence of -- the overall analysis doesn't provide
7 additional supportive evidence.

8 Q. So you would agree that the overall
9 association of 0.88 does not provide supportive
10 evidence of consistency for vinyl chloride and
11 bladder cancer, correct?

12 MR. RUZICKA: Objection, form.

13 A. The overall association does not provide
14 additional supportive evidence.

15 Q. You would agree that Mundt 2000 also
16 shows no elevated measure of association, correct?

17 A. Correct. If you look on or if you look
18 on page 31, your statement is correct. However,
19 that same cohort was re-analyzed 15 --
20 approximately 15 years later, and at that point an
21 elevated measure of association was identified.

22 This in part highlights what I was just
23 speaking about, that bladder cancer predominantly
24 occurs as people age; and if you have time for
25 additional followup, what may initially reveal no

1 association will then reveal an association.

2 It's not possible to definitively say
3 whether that's going to happen without doing a
4 subsequent analysis, but the absence of evidence on
5 an initial analysis is not evidence against
6 causation.

7 Q. I want to direct you back to my
8 question. My question, I specified Mundt 2000.
9 You would agree that Mundt 2000 does not show an
10 elevated measure of association, correct?

11 MR. RUZICKA: Objection, form.

12 A. I've already answered that, and I don't
13 think you can separate that from the initial
14 analysis when a subsequent analysis has been
15 performed by the same cohort.

16 It's not scientifically or
17 methodologically reasonable to ignore a followup
18 analysis if it's being performed by the same cohort
19 with the same exposure and outcome relationship.
20 The subsequent followup almost always provides
21 additional information.

22 Q. Would you agree that age is a risk
23 factor for bladder cancer?

24 MR. RUZICKA: Objection, form. Or,
25 sorry, strike my objection. You can answer.

1 A. Age is a -- bladder cancer is more
2 frequently seen as people age, and you are more
3 likely to develop bladder cancer as an older adult.

4 People use risk factors in different
5 ways, and so from a statistical or demographic
6 perspective, age is a risk factor from a --
7 oftentimes, though, that's conflated with what is a
8 modifiable risk factor or something that you could
9 do to prevent developing bladder cancer, and it's
10 not possible to do that with age. Everybody ages,
11 so...

12 Q. Hopefully.

13 A. Yeah.

14 Q. But you would agree that you are more
15 likely to see -- or that a person is more likely to
16 develop bladder cancer the older they are?

17 MR. RUZICKA: Objection, form,
18 foundation.

19 A. Yes. It's more likely to identify
20 bladder cancer in older adults.

21 Q. Is it your opinion that the Mundt and
22 Bove 2014a studies are sufficient to show
23 consistency for vinyl chloride and bladder cancer?

24 A. They provide, I think as I state,
25 limited evidence of consistent -- limited but

1 consistent evidence. These are different
2 investigators analyzing different cohorts.

3 Q. Under "Exposure-Response" on page 32, do
4 you see that section?

5 A. Yes.

6 Q. You identified one study that
7 demonstrates a non-monotonic exposure response?

8 A. Correct.

9 Q. And that study is Bove 2014, right?

10 A. Correct.

11 Q. Aside from Bove 2014, you didn't
12 identify any studies that demonstrate evidence of a
13 non-monotonic exposure response between vinyl
14 chloride and bladder cancer, correct?

15 A. I didn't identify any other studies that
16 evaluated dose with respect to vinyl chloride and
17 bladder cancer, so it's not possible to identify
18 another study that has an exposure-response
19 relationship.

20 Q. And that means you didn't identify any
21 studies that demonstrate evidence of a monotonic
22 exposure-response between vinyl chloride and
23 bladder cancer, correct?

24 A. That is -- that is correct and I don't
25 think I've stated that anywhere, that opinion

1 anywhere, that there is a monotonic
2 exposure-response relationship identified in the
3 literature.

4 Q. Bove 2014a is the Marine/Navy mortality
5 study, right? When you refer to 2014a, is that
6 what you are referring to?

7 A. Oh, you are asking which study it is?

8 Q. Yes.

9 A. That is a military personnel mortality
10 study, the military personnel mortality study.

11 Q. If you go ahead and take a look at
12 Exhibit 12. Is this the study that you are
13 referring to?

14 A. I believe so, yes.

15 Q. You would agree with me that there is a
16 lack of analogous evidence to support vinyl
17 chloride as a cause of bladder cancer, correct?

18 A. I think I state on page 32 currently
19 there is a lack of analogous evidence to support
20 vinyl chloride as a cause of bladder cancer and --

21 Q. And do you agree with that statement?

22 A. Yeah. My position has not changed or my
23 opinion has not changed.

24 Q. You can set that report aside.
25 Actually, I apologize, I'm going to retract that

1 last statement.

2 Can you turn to page 37 -- or, excuse
3 me, 39 of the bladder cancer report.

4 A. Yes.

5 Q. And do you see where it says
6 "Mechanistic Studies"?

7 A. Yes.

8 Q. You have a statement in there, "Although
9 untransformed TCE is not particularly toxic, DCGV
10 and DCVC both demonstrate mutagenicity, correct?

11 A. Yes, you read that correctly.

12 Q. You would agree that mutagenic changes
13 don't always result in cancer, correct?

14 A. That is correct, they do not always
15 result in cancer.

16 Q. And you conducted a literature search
17 for animal studies for both kidney cancer and
18 bladder cancer, correct?

19 A. Correct.

20 Q. And you didn't --

21 A. Although that was not the primary focus
22 of my literature search, the primary focus was on
23 human evidence, I included relevant animal studies.
24 And I don't think I've suggested that I have a
25 comprehensive search on specifically animal

1 studies, although I believe I have pulled the key
2 studies.

3 Q. So you can't say sitting here today
4 whether or not you've reviewed all of the relevant
5 animal studies?

6 A. I think I've reviewed all relevant key,
7 informative animal studies. There may be
8 additional studies, but I don't know that they
9 provide contributory evidence that would influence
10 my opinion.

11 Q. You would agree that animal studies that
12 do not reflect realistic doses for humans are
13 unreliable, correct?

14 A. I don't think that is a correct
15 statement. Reliability refers to how a study --
16 how a study is designed and whether the methodology
17 is followed and whether it's appropriate
18 methodology.

19 It may be -- a study may be reliable
20 even if they are exposing animals to not realistic
21 doses of or doses that would not be realistically
22 encountered by humans if the purpose is to test
23 exceedingly high doses and see if there is any
24 effect at even doses that well exceed what a human
25 might be exposed to. So they can be informative

1 even if the doses are not doses that humans would
2 potentially be exposed to.

3 Q. Can you please take out Exhibit 9.

4 A. Yes.

5 Q. And please turn to page 8. Are you on
6 page 8?

7 A. Yes.

8 Q. In the first paragraph about two-thirds
9 of the way through there is a sentence that starts
10 with "However, the most salient." Do you see that?

11 A. Yes.

12 Q. It says, "However, the most salient
13 question related to animal data is how reliable is
14 animal carcinogenicity data as a predictor of
15 cancer in humans? The answer is that demonstration
16 of tumor formation in animals is not a reliable
17 predictor of cancer in humans." Correct?

18 A. Are you asking if you read that
19 correctly?

20 Q. Yes.

21 A. Yes, you read that correctly.

22 Q. And do you agree with that statement?

23 A. Yes. I wrote that statement and agree
24 with it. That's different than the question you
25 asked me just immediately preceding, though.

1 Q. Do you agree that tumor formation in
2 animals is not a reliable predictor of cancer in
3 humans?

4 A. Depending on the -- depending on the
5 model that is used, it may be. However, it is not
6 a -- it's not the case that cancer formation in
7 animals reliably predicts cancer formation in
8 humans if you look at the total body of evidence.

9 If you are looking at a specific
10 mechanistic pathway that is shared between humans
11 and animals, it may be a reliable predictor, and as
12 you look at species that are closer to humans, it
13 may be more reliable; but it is very individual
14 depending on the compound being analyzed and the
15 mechanism of cancer causation that's theorized or
16 being studied in the individual study.

17 Q. Dr. Hatten, when you wrote in your 2022
18 report for the Zantac litigation the demonstration
19 of tumor formation in animals is not a reliable
20 predictor of cancer in humans, do you agree with
21 that statement today?

22 MR. RUZICKA: Objection, form.

23 A. Yeah, I think I've answered that already
24 a couple times. I'm saying if there is a specific
25 pathway that is shared between humans and animals,

1 it may be a reliable predictor. But I think, as I
2 also said, overall, just looking at the total
3 landscape of animal studies and saying that these
4 predict human studies, that is not a reliable
5 predictor. So it again depends very much on the
6 specific hypothesis being tested and the studies
7 being performed.

8 Q. Dr. Hatten, in your 2022 report for the
9 Zantac litigation, you don't say that there are
10 circumstances where animal studies may be reliable
11 predictors of carcinogenicity in humans, do you?

12 A. I think the last sentence in that
13 paragraph says animal models are useful as a screen
14 for potential carcinogenicity and that negative
15 testing, so not seeing cancers in animals, is
16 actually helpful because it's unlikely for humans
17 to develop that.

18 I didn't go in the landscape of the
19 Zantac literature. There is not a -- and this is
20 veering into litigation that is off topic, but
21 there is not a strong body of animal evidence to
22 support cancer causation in animals that would
23 translate to humans.

24 Q. You would agree that the evidence of
25 benzene as a cause of kidney cancer in animal

1 studies is limited, correct?

2 A. Yes. I think I stated that in my
3 report.

4 Q. And you only identified one study that
5 was relevant to that analysis, correct?

6 A. Correct, and I think I state currently
7 the literature base is too limited to define a
8 precise pathway or mechanism of injury for benzene
9 exposure leading to the development of bladder
10 cancer.

11 Q. Dr. Hatten, I'm asking about your
12 conclusions regarding benzene and kidney cancer.

13 A. Sorry. I thought you were asking about
14 bladder cancer.

15 Q. You had only one study related to -- one
16 animal study related to benzene as a cause of
17 kidney cancer, correct?

18 A. I think the sentence I just read, I
19 applied the same sentence in my kidney cancer
20 report, saying that the literature base is too
21 limited to define a precise pathway or mechanism of
22 injury for benzene exposure leading to development
23 of kidney cancer.

24 MS. SILVERSTEIN: We have been going
25 for about an hour. I think this is a good

1 time for a short break.

2 THE VIDEOGRAPHER: The time is 4:11.

3 We are off the record.

4 (Recess taken.)

5 THE VIDEOGRAPHER: The time is

6 4:18 p.m. We are back on the record.

7 BY MS. SILVERSTEIN:

8 Q. Dr. Hatten, do you have your kidney
9 cancer report by you?

10 A. Yes.

11 Q. Could you please turn to page 33.

12 Are you on page 33?

13 A. Yes.

14 Q. On page 33 when discussing benzene and
15 kidney cancer, you say, "Given the weight of
16 evidence presented in the Bradford Hill analysis
17 the 'as likely as' standard is satisfied," correct?

18 A. Correct. You read that correctly.

19 Q. And a little bit further down on the
20 page you say, "The weight of the evidence indicates
21 that benzene is at least as likely as not a cause
22 of kidney cancer," right?

23 A. Yes.

24 Q. What does "as likely as not" mean in
25 these?

1 A. It -- my understanding is that it is --
2 that there is some evidence or sufficient -- there
3 is evidence that supports a causal link between the
4 exposure and outcome of concern. However, it does
5 not rise to the level of -- a level to fully
6 establish that as a confirmed or accepted causal
7 association.

8 That framework is the one that was
9 utilized by the government, the U.S. Government in
10 the ATSDR 2017 analysis of the evidence and is
11 even, at least in my opinion, I think as I state in
12 the report, is even more conservative than what the
13 plain language of the causal burden is in the
14 statute, at least the way I would read it as a
15 scientist.

16 Q. When you say it's more conservative than
17 the plain language of the statute, what do you
18 mean?

19 A. "As likely as" is essentially -- it's --
20 at least the way I would read it as a scientist is
21 that there is -- the evidence for and against it is
22 approximately balanced; and I think the way the
23 ATSDR framework is set up is requiring a higher
24 burden for defining "as likely as" compared to
25 that, a complete balance between the evidence.

1 Q. Where did you get the "as likely as not"
2 language?

3 A. I don't know if I understand your
4 question, so could you --

5 Q. How did you decide to use the language
6 "as likely as not" in your report?

7 A. I mean, if I recall, it is statutorily
8 defined and then was employed by -- that or similar
9 language was employed by the Institute of Medicine
10 in their 2008 report and again by the ATSDR in
11 their 2017 assessment of the evidence that
12 pertained directly to this -- this issue of Camp
13 Lejeune water contamination. We have reviewed that
14 already, that document already today.

15 Q. Did you make the decision -- how did you
16 decide that the language "as likely as not" was
17 relevant to your general causation opinions as an
18 expert witness in litigation?

19 A. Because my understanding is that that is
20 part of a specific circumstance that's applied to
21 this cohort of potentially exposed individuals
22 based on an act of Congress.

23 Q. Did you review the Camp Lejeune Justice
24 Act?

25 A. I've reviewed parts of it. I don't know

1 if I read the entire thing or not. I just can't
2 recall if I read all pages that were contained in
3 it.

4 Q. Do you consider yourself an expert in
5 statutory interpretation?

6 A. I do not.

7 Q. And would it be fair to say that you
8 don't generally use the "as likely as not" standard
9 in your expert reports outside of the Camp Lejeune
10 litigation?

11 MR. RUZICKA: Objection, form.

12 A. I have not used that framework outside
13 of Camp Lejeune, but I'm also not aware that other
14 than specific circumstances, when it is the weight
15 of -- the standard for weighing evidence has been
16 altered by -- by the legislature, that that is not
17 typically something I would use outside of that
18 unless there is a specific directive to use a
19 different -- that standard.

20 Q. When you say "a specific directive," a
21 directive from who?

22 A. From the legislature based on the
23 reading of that statute and then how it's been
24 applied by the U.S. Government itself and the ATSDR
25 assessment of the evidence.

1 Q. Dr. Hatten, you are aware that the Camp
2 Lejeune Justice Act was passed in 2022, correct?

3 A. I don't recall what year it was passed.

4 Q. If I represent to you that it -- I
5 guess, did you consider when this statute was
6 passed before deciding to apply the framework in
7 that statute?

8 A. I did not consider one way or another.
9 It had been passed by the time I was evaluating the
10 evidence in this case.

11 Q. And in other cases where you have been
12 an expert report, have you reviewed the statutory
13 text of -- relevant to those litigations?

14 A. I'm not aware that I have been involved
15 in any litigation that includes a statutory text
16 related to it.

17 Q. Do you normally review the applicable
18 case law or legal standards when you serve as an
19 expert witness?

20 A. I do if it is -- if it -- if it varies
21 from the usual way that evidence is weighed.

22 For example, there are times I have been
23 involved in disability proceedings that have
24 different definitions for what -- how to weigh
25 evidence or what factors to take into account, and

1 in those cases I review the relevant guidelines.
2 It's not always statutes. Sometimes it's
3 administrative guidelines that apply to it.

4 So if it is -- if it is something
5 unique -- or not unique but something that is
6 specifically relevant to the evaluation of evidence
7 at hand, then I do review it in those cases.

8 Q. Did you review the Federal Tort Claims
9 Act for this case?

10 A. I do not recall if I -- I don't recall
11 if I specifically reviewed it for this act -- or
12 for this case.

13 Q. Would you agree with me that -- well, I
14 guess, scratch that.

15 Is it your understanding that the "as
16 likely as not" standard requires less evidence than
17 the causation standard you applied in the Zantac
18 litigation?

19 MR. RUZICKA: Object to form.

20 A. My understanding is that it's a
21 different way of evaluating the evidence with a
22 different -- different lens for evaluating the
23 total body of evidence, not that it's less,
24 necessarily less, but it is a different framework
25 for eval- -- or I don't want to say framework, but

1 a different, as I said, lens for evaluating the
2 evidence.

3 Q. And by "lens," you mean it is a
4 different standard for evaluating the evidence,
5 right?

6 MR. RUZICKA: Objection, form.

7 A. It is -- my understanding is -- is it
8 is stat- -- at least based on my reading of this --
9 as I said, I'm not a legal expert, but it
10 explicitly identifies a -- an alternative way -- or
11 not an alternative but a additional pathway for
12 identifying causation in addition to the way weight
13 of evidence is applied in the majority of cases.

14 Q. You would agree that "as likely as not"
15 is a legal term, right?

16 MR. RUZICKA: Object to form.

17 A. It -- the specific language "as likely
18 as not" may be a legal term, but it is used every
19 day in medical practice. When we evaluate
20 somebody, we are often evaluating based on limited
21 evidence or evidence that is conflicting; and we
22 don't wait for a -- or we don't have a requirement
23 of a specific causation burden to proceed with
24 treating a patient or evaluating a patient based on
25 the amount of evidence that's available and --

1 Q. Dr. Hatten, you'd agree --

2 A. I'm still --

3 MR. RUZICKA: No, no. You are not
4 interrupting him during his statement.

5 MS. SILVERSTEIN: Okay. He can
6 continue. That's fine.

7 MR. RUZICKA: You have done it three
8 times today. Please let him finish his
9 responses.

10 BY THE WITNESS:

11 A. I would say it's something that is used,
12 a way of evaluating evidence that is used routinely
13 in medical practice, and it's something that I'm
14 familiar with and very comfortable with. It is not
15 something I routinely apply in evaluating evidence
16 in the midst of a legal proceeding.

17 BY MS. SILVERSTEIN:

18 Q. Okay. Well, you would agree with me
19 that in this case, the Camp Lejeune litigation, you
20 got the language "as likely as not" from the Camp
21 Lejeune Justice Act, which is a statute, correct?

22 MR. RUZICKA: Object to form.

23 A. In that I identified it both in the Camp
24 Lejeune Justice Act as well as in various other
25 similar applications of that language such as the

1 Institute of Medicine 2008 report, the Government's
2 own 2017 ATSDR assessment of the evidence, I had
3 thought it would be somewhat farcical and
4 ridiculous that the Government would suggest that
5 their own framework for assessing evidence is
6 wrong; and so I did not even consider whether you
7 would be attacking the Government's own assessment
8 of the evidence, which it seems like you are doing
9 here.

10 Q. Dr. Hatten, is it your understanding
11 that the assessment of the evidence is sufficient
12 to meet the legal standard in a court of law for
13 general causation?

14 MR. RUZICKA: Objection, form.

15 A. My understanding is that as it's applied
16 in the specific situation of people exposed to Camp
17 Lejeune water, that is an acceptable framework for
18 using that, and it's not as if it's unique to that.
19 It's used in other venues, in medicine for
20 determining -- in the medical legal system for
21 determining whether the weight of the evidence
22 supports a specific outcome, and there are multiple
23 examples of that. But again, they are cases where
24 -- or not cases, but situations where that has been
25 explicitly defined as a avenue for assessing

1 causation.

2 Q. Dr. Hatten, please provide a list of all
3 peer-reviewed articles that you have reviewed that
4 use the "as likely as not" standard.

5 MR. RUZICKA: Objection to form.

6 A. Are you asking for that at the moment
7 or --

8 Q. Yes. Please list to me all
9 peer-reviewed publications that you can think of
10 that use the "as likely as not" standard.

11 A. I don't think that's a reasonable
12 question to ask. It's not something that was
13 included in my report, and I don't have that
14 available off the top of my head.

15 Q. So sitting here today you can't think of
16 a single peer-reviewed publication that uses the
17 "as likely as not" standard; is that correct?

18 MR. RUZICKA: Object to form.

19 A. No, that's not the case. As I said
20 earlier, I reviewed the Government's witness,
21 Dr. Goodman, her deposition transcript, and there
22 was a question about an article that she had
23 published that's also on my supplemental materials;
24 and she employs the "as likely as not" standard in
25 that peer-reviewed publication. This is the

1 witness the Government provided to assess causation
2 and has used that in the scientific literature.

3 That is one example. I can likely
4 provide additional ones, but I had not prepared a
5 list of that for the deposition today.

6 Q. You weren't aware of Dr. Goodman's
7 article before writing your reports on kidney
8 cancer or bladder cancer for general causation,
9 correct?

10 A. I don't know if I'd reviewed it or not
11 at some point. I review literature on air
12 pollution and respiratory outcomes intermittently,
13 and I may have reviewed that article at some point
14 in the past, but I did not pull it specifically for
15 the purposes of writing my reports.

16 Q. And you didn't consider it in writing
17 your reports, correct?

18 A. I didn't --

19 Q. Dr. Hatten, surely if it was --

20 MR. RUZICKA: No, no, please.

21 MS. SILVERSTEIN: I'm changing my
22 question.

23 MR. RUZICKA: You can't. He is
24 answering the question.

25 THE WITNESS: But I started answering.

1 BY MS. SILVERSTEIN:

2 Q. Okay, all right. Go ahead. You didn't
3 consider it when preparing your reports, correct?

4 A. I did not consider whether there was a
5 reason to do a literature search on the standard
6 that was stated in the statute and was delineated
7 in the U.S. Government agency who was tasked with
8 evaluating this question and utilized that same
9 language.

10 It did not cross my mind that this would
11 be a contentious issue, so I did not conduct an
12 independent literature search looking for all
13 instances of when that might have been used in the
14 medical literature.

15 Q. Okay. Thank you for that answer,
16 Dr. Hatten. That wasn't quite what I asked.

17 I understand that you didn't conduct a
18 literature search pertaining to the "as likely as
19 not" standard, but what my question is, is you did
20 not consider the article by Dr. Goodman that you
21 are now stating uses the "as likely as not"
22 standard when writing your reports for the Camp
23 Lejeune litigation, correct?

24 MR. RUZICKA: Objection, form, asked
25 and answered.

1 A. I did not explicitly consider that
2 article when writing my reports. As I said, I
3 didn't think it would be a -- it didn't cross my
4 mind that this would be a issue of contention, and
5 until I started reading deposition transcripts from
6 other experts and realized that -- and the
7 Plaintiff -- or, I mean, the Defendant expert
8 reports and realized that this was potentially
9 something, an issue that would be raised.

10 It just seemed nonsensical to me that
11 the Government would both produce a scientific
12 report that utilized the standard and then at a
13 later date, when faced with potentially paying out
14 benefits, would try to change their assessment of
15 what is an acceptable method of evaluating the
16 evidence.

17 Q. You would agree -- well, in your reports
18 you identified the equipoise and above standard as
19 equivalent to as likely as not, correct?

20 A. I believe that is how it was
21 operationalized in the 2017 ATSDR. They made those
22 approximately equivalent.

23 Q. And, Dr. Hatten, you keep referencing
24 the ATSDR 2017 assessment of the evidence. You
25 would agree that your conclusions as to whether

1 there was equipoise or equipoise or above evidence
2 different than the conclusions that the ATSDR
3 found, correct?

4 MR. RUZICKA: Objection, form.

5 A. I think we've discussed this a few
6 times. Number one, their assessment was done in
7 2017. Number two, it's an independent evaluation
8 of the evidence. That doesn't mean that the
9 framework for evaluating the evidence that's
10 available in the case was different.

11 Q. Okay. I want to direct you back to the
12 question I asked. Your conclusions are different
13 than the ATSDR's conclusions in 2017, correct?

14 MR. RUZICKA: Objection, form, asked
15 and answered.

16 A. I had answered that question already,
17 but I can answer it again.

18 My conclusions are not all the same as
19 what was in the 2017 assessment of the evidence.
20 However, that is also at a -- eight years before
21 today, and that was conducted at least eight years
22 before today, and there is additional evidence
23 that's available.

24 In addition, I independently reviewed
25 the evidence and made my own assessment, but I

1 utilized a -- the same structure for analyzing it
2 as the U.S. Government did in their publication.

3 Q. I am handing you Exhibit 36.

4 (Exhibit 36 was marked for
5 identification and is attached to
6 the transcript.)

7 BY MS. SILVERSTEIN:

8 Q. I handed you the National Academy of
9 Science -- National Academies of Science document
10 reviewing the VA presumptive -- presumption
11 process, correct?

12 A. You handed this to me, correct.

13 Q. And did you review this before writing
14 your report?

15 A. I don't recall if I did or not.

16 Q. If you reviewed it in your report, you
17 would have cited it in your materials considered
18 list, right?

19 A. I don't know if I would have cited it if
20 I reviewed it while writing my report. I'm not
21 sure if I would have or wouldn't have. I just
22 can't recall whether I reviewed this.

23 Q. Dr. Hatten, are there documents that you
24 reviewed while writing your report that you did not
25 list in your materials considered list?

1 A. I review hundreds and hundreds of
2 articles every year for various context. I
3 explained what the specific literature search was
4 and cited pertinent literature, the pertinent
5 literature in my report. I didn't cite everything
6 that is not directly relevant to my report.

7 Q. Do you think that an analysis of the
8 equipoise framework that you relied on is pertinent
9 to your conclusion -- to your conclusions?

10 MR. RUZICKA: Objection, form.

11 A. Are you --

12 Q. Would you like me to rephrase?

13 A. Sure, if you can rephrase.

14 Q. If there is an opinion out there that
15 said the equipoise standard is terrible and nobody
16 should ever use it, would that have been something
17 that you would have wanted to know --

18 MR. RUZICKA: Objection.

19 Q. -- before writing your reports?

20 MR. RUZICKA: Objection, form.

21 A. I think I would be interested to read an
22 assessment that says the equipoise standard is
23 terrible it should not be used. I'm not certain
24 that this document states that.

25 Q. You haven't reviewed it, right?

1 A. That is not what I said. I said I may
2 or may not have reviewed this. I don't recall
3 whether I have or have not reviewed this.

4 Q. So you have no idea whether you reviewed
5 the document?

6 A. I don't recall whether I have or have
7 not.

8 Q. Go ahead and go to page 104.

9 A. Are you asking me to review this
10 document?

11 Q. I'm asking you to turn to page 104.

12 A. I'm not comfortable providing any
13 commentary on a document I've not -- I can't
14 confidently say I've reviewed or not reviewed
15 before. And if you want to give me time to read
16 the entire document I'm happy to do that, and then
17 I will answer questions on it, but I'm not
18 comfortable answering questions on a document I
19 have not reviewed.

20 MS. SILVERSTEIN: I'm happy to go off
21 the record and let you review the document.

22 THE VIDEOGRAPHER: Did you want to go
23 off the record, counsel?

24 MS. SILVERSTEIN: Yes, please.

25 THE VIDEOGRAPHER: The time is

1 4:44 p.m. We are going off the record.

2 (Recess taken.)

3 THE VIDEOGRAPHER: The time is 4:58.

4 We are back on the record.

5 BY MS. SILVERSTEIN:

6 Q. Dr. Hatten, I handed you a moment ago
7 Exhibit 36, the NAS review of the VA presumption
8 process. Do you have that document?

9 A. Yes.

10 Q. And can you turn to page 104, please.
11 Are you on page 104?

12 A. Yes.

13 Q. Do you see about three-quarters of the
14 way down the page there is an indented quote or an
15 indented and italicized paragraph?

16 A. Yes.

17 Q. And do you see where it says, "The
18 committee concludes that the term 'equipoise'
19 denotes a lack of consensus across the medical
20 community and that the term as required by law to
21 be used in the presumption decision process is
22 inconsistent with the current scientific use."

23 Did I read that correctly?

24 A. You read that sentence correctly, yes.

25 Q. I read that correctly?

1 A. Yes.

2 Q. We can go ahead and set that aside.

3 A. So you handed me a document that I had
4 never looked at before. Immediately above that it
5 describes how equipoise is actually used in
6 science.

7 I don't think it's a fair
8 characterization of anything in the document. This
9 is a new document I've read, to read this one
10 paragraph and suggest, because I think the
11 implication is that this is potentially an
12 unscientific way to use -- or an unscientific word.
13 It is used in science, and they explain that
14 immediately above.

15 Q. Dr. Hatten, my question was simply
16 whether I read the sentences correctly, sentence
17 correctly. Did I read the sentence correctly?

18 A. You read it correctly, but this is my
19 deposition, and you were asking me a question about
20 this document. I have additional opinions about
21 this document based on exceedingly limited
22 evaluation of it. You handed it to me just before.
23 I don't think the way your question was asked
24 characterizes what is stated in the document.

25 Q. Okay. Your counsel is welcome to

1 redirect you on a document that you say you haven't
2 reviewed.

3 Dr. Hatten, is it your opinion that
4 "as likely as not" and "a reasonable degree of
5 scientific certainty" have the same meaning?

6 MR. RUZICKA: Object to form.

7 A. No. This -- that is not my opinion.

8 Q. Is it your opinion that "as likely as
9 not" has a different meaning than "a reasonable
10 degree of scientific certainty"?

11 A. It's my opinion that those are
12 describing two different points and how you express
13 your evaluation of the evidence, how an expert
14 would express their evaluation of the evidence.

15 Q. Sitting here today, have you formed an
16 opinion as to whether the Camp Lejeune water to a
17 reasonable degree of scientific certainty causes
18 bladder cancer or kidney cancer?

19 A. Yes.

20 Q. And is that detailed in your report?

21 A. Yes.

22 Q. Do you use the standard "a reasonable
23 degree of scientific certainty"?

24 A. I don't recall if I used those specific
25 words in here or not.

1 Q. Do you have --

2 A. I -- I state my conclusions on page 45
3 in the kidney cancer report --

4 Q. Are your opinions on page --

5 A. -- and on page 41 in my bladder cancer
6 report. I say I hold the following opinions to a
7 reasonable degree of scientific certainty.

8 Q. Earlier in your report you offer the
9 opinion exposure to vinyl chloride is at least as
10 like as not a cause of bladder cancer on page 33.
11 Is that correct?

12 A. Yes, you read that correctly.

13 Q. And is that an accurate description of
14 your opinion of vinyl chloride and bladder cancer?

15 A. Yes, that's the opinion I express in my
16 report; and as I have stated multiple times today,
17 I haven't changed the opinions I expressed in my
18 report.

19 Q. What is your understanding of the
20 difference between the standard as likely as not
21 versus a reasonable degree of scientific certainty?

22 MR. RUZICKA: Objection, form.

23 A. The -- I think as I had just stated
24 before, the reasonable degree of scientific
25 certainty has to do with how as a scientist you

1 evaluate the evidence. As likely as not is the
2 means of framing and evaluating that evidence with
3 respect to a specifics exposure-response relationship.

4 So one is the degree of certainty I have
5 in that opinion based on scientific principles.
6 The second is the way how the evidence is weighed
7 in considering the specific causal relationship.

8 Q. Okay. So in the Camp Lejeune reports
9 that you have offered for kidney cancer and bladder
10 cancer, are you saying that the weight of the
11 evidence shows that it's as likely as not that
12 vinyl chloride, for example, causes bladder cancer?

13 MR. RUZICKA: Objection, form.

14 A. Yes. I believe that's what I have
15 stated and what is written in my report.

16 Q. Okay. And then --

17 A. Can I -- sorry. Assuming I understand
18 your question correctly, because I still don't know
19 that I fully understand the questions you are
20 asking, but the way I am interpreting it and the
21 way I've explained I believe are all consistent
22 with what is written in the report.

23 Q. And so when you use a reasonable degree
24 of scientific certainty, are you saying that to a
25 reasonable degree of scientific certainty it is as

1 likely as not that vinyl chloride causes bladder
2 cancer?

3 A. Yes. Those are the words that I've said
4 and the -- if not the exact phrasing, the essence
5 of the phrasing that is in my report.

6 Q. And does that mean that based on the
7 available scientific literature you feel fairly
8 confident that -- reasonably confident that vinyl
9 chloride is as likely as not to cause bladder
10 cancer?

11 MR. RUZICKA: Objection, form.

12 A. Correct, and I think for a concrete
13 example, if I were seeing a patient who -- in my
14 toxicology clinic upstairs who had a vinyl chloride
15 exposure and was asking about the -- whether they
16 were potentially going to develop bladder cancer, I
17 would say based on the evidence now, the
18 big-picture question of can this exposure cause
19 bladder cancer would be it's at least as likely as
20 not that that can occur; and that is a specific
21 causation opinion for a hypothetical patient in my
22 toxicology clinic applying the weight of the
23 evidence that I've evaluated in this report.

24 Q. Dr. Hatten, you would agree that even in
25 an instance where you believe the scientific

1 evidence shows that a health outcome is possible,
2 that doesn't mean that the health outcome is
3 guaranteed, right?

4 MR. RUZICKA: Objection, form.

5 A. Yes. That is always the case except for
6 somebody who has been dead for a long time. That
7 outcome is pretty final, so...

8 Q. Is your understanding of what a
9 reasonable degree of scientific certainty means is
10 the same in every case you have been an expert for?

11 MR. RUZICKA: Objection, form.

12 A. Yes. My understanding is that it has to
13 do with the methodology that's applied and how --
14 as a scientist how you utilize your scientific
15 expertise in forming your opinion.

16 Q. In -- do you have one of your reports in
17 front of you?

18 A. Yes.

19 Q. Which report do you have?

20 A. I have bladder and kidney next to each
21 other.

22 Q. If you want to look at your bladder
23 cancer report on page 9. Are you on page 9?

24 A. Yes.

25 Q. The first paragraph that isn't a bullet

1 point starts with "I have reviewed." Do you see
2 where I am?

3 A. Yes.

4 Q. It says, "I have reviewed the ATSDR
5 water modeling, the exhibits to Plaintiff's expert
6 Morris Maslia, and his published reports which are
7 consistent. ATSDR PHA 2017, Maslia 2008, Maslia
8 2013, Maslia expert report 2024. The levels of
9 these chemicals in the water at Camp Lejeune are
10 hazardous to humans generally and also known to
11 cause bladder cancer."

12 Did I read that correctly?

13 A. Yes, you read that correctly.

14 Q. I will represent that you have
15 substantially the same statement in your kidney
16 cancer report. Does that sound correct?

17 A. I believe it's substantially the same.

18 Q. Is it your opinion that the levels of
19 chemicals in the water in any given month from 1953
20 to 1987 are hazardous to humans generally and known
21 to cause bladder or kidney cancer?

22 MR. RUZICKA: Objection, form.

23 A. Not -- not necessarily. I think it
24 depends on the specific modeling for the month that
25 someone, an individual, was potentially exposed.

1 I think I had set forward the levels
2 that had been identified as hazardous and we have
3 discussed some of those earlier, but they are set
4 out in my report.

5 Q. When you say it depends on the specific
6 modeling for the month, do you mean it depends on
7 what the specific estimated concentrations are in
8 any given month?

9 MR. RUZICKA: Objection, form.

10 A. In the context of assessing whether
11 someone may have had an exposure sufficient to be
12 causal, yes.

13 Q. And do you agree that there are some
14 months where the Camp Lejeune water modeling
15 between 1953 and 1987, the exposure isn't enough to
16 be hazardous to humans generally?

17 MR. RUZICKA: Objection to form. I'm
18 going to direct him not to answer at this
19 point. Let's go off the record and discuss
20 this.

21 THE VIDEOGRAPHER: The time is
22 5:13 p.m. We are off the record.

23 (Discussion was had off the
24 record.)

25 THE VIDEOGRAPHER: The time is

1 5:19 p.m. We are back on the record.

2 BY MS. SILVERSTEIN:

3 Q. Dr. Hatten, I'm directing you to page 8
4 of your bladder cancer report.

5 A. Okay.

6 Q. On page 8 you say under the heading
7 "Hadnot Point," PCE contamination of at least 0.1
8 parts per billion was estimated beginning in the
9 1970s. Do you see that?

10 A. Yes.

11 Q. Is it your opinion that based on the
12 epidemiologic and toxicologic evidence a
13 concentration of 0.1 parts per billion of PCE is
14 capable of causing bladder cancer?

15 MR. RUZICKA: Objection, form.

16 A. I think if we look at the -- if we look
17 on page 35 of my report, I identify that the low
18 contamination group, which is some contamination.
19 So greater than zero to 36, that group has been
20 identified as an elevated, has been identified with
21 a association with bladder cancer. I'm not able to
22 tease that down any further, though. That is a
23 group of exposures that all go into that.

24 There is additional evidence that I lay
25 out following that, and that is in the -- like in

1 the Aschengrau study they provide some estimates
2 that are also in similar orders of magnitude that
3 are associated with development of bladder cancer.
4 That doesn't necessarily mean that .1 parts per
5 billion is associated with bladder cancer, but
6 those groups have been identified to be associated
7 with bladder cancer. I think it would require an
8 individual assessment of a patient to know.

9 Q. Dr. Hatten, would it be fair to say that
10 you don't have an opinion as to what the lowest
11 possible concentration of PCE that can cause
12 bladder cancer is?

13 MR. RUZICKA: Objection to form.

14 A. I have not developed that opinion or
15 expressed that opinion aside from identifying the
16 levels that have been associated in the
17 epidemiologic literature.

18 Q. And would it be fair to say that you
19 have no opinion as to what the lowest possible
20 concentration of TCE that can cause bladder cancer
21 is?

22 A. I think the answer would be essentially
23 the same, recognizing that all of these are
24 exposures that are associated with those diseases,
25 bladder cancer and kidney cancer, in people who are

1 actually exposed on base.

2 The true level that is potentially able
3 to cause or that is a cause of bladder or kidney
4 cancer would almost certainly be lower than that,
5 but it has not been evaluated in the epidemiologic
6 literature. If there is a lower bound in these
7 groups, it's almost certainly below that because
8 these are ones where an actual association has been
9 identified in the population of interest with the
10 exposure of interest.

11 Q. If you were asked to identify a lower
12 bound concentration for PCE, TCE, vinyl chloride or
13 benzene that can cause kidney cancer or bladder
14 cancer would you be able to provide a lower bound
15 estimate?

16 MR. RUZICKA: Objection, form.

17 A. I think I've already stated I provided
18 the lower bounds, both the upper and lower bounds
19 for the groups that have been associated in the
20 epidemiological literature; and it gets
21 particularly important that these are -- we have
22 data from the actual cohort of concern.

23 Oftentimes in toxicology or medicine we
24 are dealing with a different population, where a
25 different population is studied. In this case the

1 actual population of interest or of concern is the
2 one that has actually been studied. So we have
3 real data from these people that demonstrates a --
4 the outcomes of concern, kidney cancer and bladder
5 cancer, in these people.

6 Q. Dr. Hatten, we discussed this earlier,
7 but through your review of the Bove studies and
8 ATSDR 2018, you are aware that Dr. Bove wasn't able
9 to -- he didn't do any kind of exposure assessment
10 on the individual participants in the study,
11 correct?

12 MR. RUZICKA: Objection, form.

13 A. He had individual outcome data and
14 utilized or assigned exposures to individuals based
15 on the dates they were present and the modeling,
16 the ATSDR modeling. That is my understanding. He
17 didn't de novo create a model for each individual
18 person. He used these -- this pre-exist -- or this
19 dataset that was developed by the U.S. Government
20 in the ATSDR and applied it on an individual basis
21 to the individuals that were being studied.

22 Q. You are aware that Dr. Bove said that he
23 didn't know where on base specific people in his
24 study lived, correct?

25 A. Not -- my understanding is he didn't

1 know with certainty for every person and used the
2 best estimates available based on the data he had
3 available.

4 Q. And Dr. Hatten, are you aware that only
5 three of the nine water systems at Camp Lejeune
6 were modeled as having contamination?

7 A. I think I listed in my report what the
8 water systems that were identified as potentially
9 being contaminated.

10 Q. So sitting here today, are you aware
11 that there are other water systems that were
12 operational at Camp Lejeune from 1953 to 1987 that
13 were not contaminated?

14 A. My understanding is that the other water
15 systems have not been identified as being
16 contaminated. I don't recall the exact number, if
17 it was six more or if there was any sharing of
18 water systems between the two or water sources
19 between the two. But my understanding is these,
20 the ones I list in my report, are the ones that
21 were identified as being contaminated.

22 Q. Are you aware that ATSDR said their
23 water modeling represented a conservative estimate?

24 A. I would have to see the context of that
25 statement to understand what you are asking about.

1 Q. So sitting here today, you are not aware
2 of whether or not ATSDR said that their water
3 modeling provided a conservative estimate, correct?

4 A. I don't recall the specific language
5 they used.

6 Q. Are you aware that the ATSDR water
7 modeling was not used for the 2024 Bove health
8 studies?

9 A. My understanding is that alternate
10 exposure metrics were employed in those, but I
11 would have to review the methodology to confirm
12 that.

13 Q. You would agree that for the
14 constituents we are talking about today, even if we
15 don't know it exactly, there is some threshold
16 level of exposure that represents when the
17 contaminant is hazardous to human health, right?

18 MR. RUZICKA: Objection, form.

19 A. Again, I think as I've answered before,
20 it depends on an individual assessment. There may
21 be an individual person who is genetically
22 extremely susceptible to exposure to one of these
23 compounds, and that individual person's threshold
24 for developing cancer may be different.

25 These are population evaluations that

1 I've reported in my -- that I've identified in my
2 report that identify population-level concerns or
3 hazard levels that have been identified as
4 hazardous on a population level.

5 Q. Can you please turn to document 9.

6 Do you have document 9?

7 A. Yes.

8 Q. Can you please turn to page 59.

9 In the second full paragraph about
10 two-thirds down the page you wrote, "The assumption
11 of no threshold level has not been demonstrated to
12 be an accurate representation of human biology."
13 Correct?

14 A. Correct.

15 Q. And then you wrote, "The existence of a
16 threshold even for many genotoxic carcinogens is
17 supported by multiple studies and is now widely
18 accepted by toxicologists," correct?

19 A. Correct.

20 MS. SILVERSTEIN: Can we just take a
21 quick two- or three-minute break?

22 MR. RUZICKA: Yeah.

23 THE VIDEOGRAPHER: The time is
24 5:31 p.m. We are off the record.

25 (Recess taken.)

1 THE VIDEOGRAPHER: The time is
2 5:36 p.m. We are back on the record.

3 MS. SILVERSTEIN: Dr. Hatten, I don't
4 have any further questions for you right now.
5 Thank you for your time all day today.

6 THE WITNESS: Thank you.

7 MR. RUZICKA: Give me ten minutes real
8 quick, please. We can go off the record.

9 THE VIDEOGRAPHER: The time is
10 5:36 p.m. We are off the record.

11 (Recess taken.)

12 THE VIDEOGRAPHER: The time is
13 5:40 p.m. We are back on the record.

14 EXAMINATION

15 BY MR. RUZICKA:

16 Q. Doctor, thanks for all your time today.
17 I just have a couple questions to clarify some
18 things.

19 In your kidney report are all the
20 opinions that you put forth, are they held to a
21 reasonable degree of scientific certainty?

22 A. Yes.

23 Q. Even though it's not explicitly stated
24 like it was in the bladder cancer report, you still
25 hold that same opinion for -- that same belief for

1 all the opinions you hold in your kidney report?

2 MS. SILVERSTEIN: Object to form.

3 A. Correct.

4 Q. And counsel earlier today asked you
5 about a monotonic response in a couple different
6 studies. Going to your kidney report, page 27 --

7 A. Okay.

8 Q. -- counsel previously indicated that you
9 cited Aschengrau and Vlaanderen for support of a
10 monotonic response. Do you recall that question?

11 A. I had questions about around that. I
12 don't recall the exact wording though.

13 Q. But in -- on page 27 of your kidney
14 report you didn't cite those two studies for a
15 monotonic exposure response, did you?

16 MS. SILVERSTEIN: Object to form.

17 A. Correct. I only identified them as
18 providing evidence of an exposure or a magnitude of
19 exposure.

20 Q. And looking at those studies, if you
21 could pull up Exhibit 25. Actually, strike that.

22 In your additional materials considered
23 list that you provided, you cited the preprint for
24 the Yu study?

25 A. Yes.

1 Q. What significance does that study
2 provide in your opinions of this case?

3 A. Although it hasn't been published in its
4 final form, so I would reserve the right to revise
5 any considerations depending on if it's changed
6 when it's fully undergone peer review and
7 publication. It provides evidence of an
8 association with low-dose benzene exposures in both
9 kidney and bladder cancer as outcomes.

10 Q. And is that a instance of where science
11 has developed that may change your opinion or maybe
12 an agency's opinion over time?

13 MS. SILVERSTEIN: Object to form.

14 A. It potentially could. I think it is
15 just additional information that would bolster my
16 opinions for both bladder and kidney cancer.

17 Q. Okay. And you were also asked about, if
18 you could look at 27, the Anttila study?

19 A. Yes.

20 Q. You were asked some questions about that
21 as it pertained to TCE and kidney cancer, and you
22 were asked about the whole period exposure metric
23 on page 803, Table 3. Do you recall those
24 questions?

25 A. Yes. On page 802, Table 3, correct.

1 Q. Okay. And you cited the SIR level of --
2 the S-I-R level of .87, correct?

3 A. That's what was reported in Table 3.

4 Q. For kidney cancer?

5 A. Correct.

6 Q. And if you look at the -- and you were
7 asked about the year since the first measurement
8 section, right, that's right beside it in Table 3?

9 MS. SILVERSTEIN: Object to form.

10 A. There are additional columns of years
11 since first measurement.

12 Q. In the years since first measurement, on
13 the first column it's zero to nine years since the
14 first measurement, and what was the SIR in that
15 instance?

16 A. 0.53.

17 Q. And then in the years since first
18 measurement column 2, 10 to 19 years, what was that
19 measurement?

20 A. 1.39.

21 Q. And in the years 20 plus, what was that
22 measurement?

23 A. It's expected to be 1.48. There were no
24 observed cases, so there is not a true value there.
25 So at a maximum you could use information from it's

1 at least ten years of exposures.

2 Q. And does that support your opinions?

3 MS. SILVERSTEIN: Object to form.

4 A. It is an elevated measure of association
5 that I identified in my report.

6 Q. You were asked about additional data for
7 PCE and kidney cancer since the 2017 ATSDR
8 assessment of the evidence. Do you recall that?

9 MS. SILVERSTEIN: Object to form.

10 A. I recall questions about that, yes.

11 Q. Were you asked about the EPA ban of PCE
12 just in this last year?

13 MS. SILVERSTEIN: Object to form.

14 A. I was not asked questions about that.

15 Q. Does the EPA ban say anything about the
16 relationship between PCE and kidney cancer?

17 MS. SILVERSTEIN: Object to form and
18 foundation.

19 A. It identifies concerns about PCE as a
20 cause of kidney cancer as partial justification or
21 one of the justifications for the ban of the U.S.
22 Government banning PCE in the U.S.

23 Q. And were you asked about the 2024 Bove
24 data?

25 A. We had discussions of the 2024 Bove

1 studies.

2 Q. And any positive associations between
3 time on Camp Lejeune and kidney cancer in those
4 studies?

5 MS. SILVERSTEIN: Object to form.

6 A. I would have to review, but I believe --
7 I believe I identified in my report that in the
8 cancer incidence study there was an elevated
9 measure of association in association with civilian
10 personnel and a monotonic exposure response with a
11 high duration of exposure associated with the
12 hazard ratio of 1.70.

13 In addition, in the mortality study, in
14 a model that used a 10-year lag, the adjusted
15 hazard ratio for kidney cancer deaths was 1.44 in
16 civilian personnel and 1.21 in military personnel.

17 There was also a monotonic exposure
18 response for duration in civilian personnel with a
19 hazard ratio of 1.68. That was with a high
20 duration of exposure.

21 Q. And so are those all three different
22 additional data points that helped your opinion
23 regarding PCE and kidney cancer since the 2017
24 ATSDR assessment of the evidence?

25 MS. SILVERSTEIN: Object to form.

1 A. It's less PCE specific and more Camp
2 Lejeune water exposure in general as the exposure
3 because these are all duration-based rather than
4 identifying specific compounds that people were
5 exposed to.

6 Q. And when you were asked about benzene
7 and kidney cancer and whether you didn't cite
8 certain studies, do you recall those studies that
9 you were asked about?

10 MS. SILVERSTEIN: Object to form.

11 A. I recall being asked a series of
12 questions about studies I didn't cite.

13 Q. And did you cite the meta-analysis for
14 -- on page 31 of your kidney cancer report from
15 2024, Seyyedsalehi?

16 A. Yes, I cited that.

17 Q. And do you know if Wong 20- -- or 2001
18 is cited in that meta-analysis?

19 A. I would have to review the list of
20 articles evaluated, although I believe a number of
21 the ones that were -- where questions were asked
22 about are cited in that, are included in that
23 meta-analysis.

24 Q. Do you recall if Honda 1995 was cited in
25 that meta-analysis?

1 A. I just don't recall. I would have to
2 review the list of studies that were included.

3 Q. Sure.

4 A. And it's in my report, but that
5 meta-analysis had an elevated meta relative risk of
6 1.20.

7 MR. RUZICKA: I don't think I have any
8 other questions. Thank you for your time.

9 MS. SILVERSTEIN: Can you give me just
10 five minutes?

11 MR. RUZICKA: Yep.

12 THE VIDEOGRAPHER: The time is 5:50.
13 We are off the record.

14 (Recess taken.)

15 THE VIDEOGRAPHER: The time is
16 5:55 p.m. We are back on the record.

17 FURTHER EXAMINATION

18 BY MS. SILVERSTEIN:

19 Q. Dr. Hatten, a few moments ago in
20 response to questioning by your counsel, you
21 answered some questions about the EPA's ban of TCE,
22 correct?

23 A. Yes.

24 Q. And to be clear, you don't offer any
25 opinions about the EPA's TCE ban in either your

1 kidney cancer report or your bladder cancer report,
2 correct?

3 A. I believe the final language was
4 released after my reports were submitted so I
5 didn't have those available.

6 Q. So that means that you don't include any
7 opinions about the TCE ban in either your kidney
8 cancer report or your bladder cancer report, right?

9 A. Correct. I did not include opinions on
10 either of those in those reports.

11 Q. And you have not as of right now
12 provided a supplemental report discussing the TCE
13 ban, correct?

14 A. Correct, I have not.

15 Q. You also didn't list the TCE ban in your
16 materials considered list, correct?

17 A. That's correct. I have reviewed the
18 language of both the TCE and PCE ban, but I don't
19 have specific opinions on those as regulatory
20 documents.

21 Q. Just to clarify what you just said, you
22 don't have any opinions on the TCE ban; is that
23 correct?

24 MR. RUZICKA: Objection, form.

25 A. Not with respect to the -- their

1 function as regulatory documents. I've reviewed
2 the literature that was cited in the ban to ensure
3 I didn't miss anything or there was nothing that
4 would change my opinion, and I didn't identify
5 anything that would change my opinions with respect
6 to causation. But I don't -- I haven't expressed
7 any opinions or formed any opinions as a regulatory
8 document, and I never held myself out as a
9 regulatory expert.

10 Q. Dr. Hatten, to be clear, I'm asking
11 about the TCE ban as it relates to your kidney
12 cancer or bladder cancer opinions. Do you have any
13 opinions about the TCE ban as it relates to your
14 kidney cancer or bladder cancer opinions?

15 A. Not with respect to the opinions. As I
16 said, I reviewed them to ensure I hadn't missed a
17 key article or a -- or there was something in those
18 documents that would lead me to reinterpret a study
19 or reconsider the findings in a study. I didn't
20 identify anything in those documents that would
21 alter my opinions, so I don't -- I don't know if
22 that answers your question, but I used them as a
23 resource like I would any other or compilation of
24 the evidence that I reviewed in my report.

25 Q. And Dr. Hatten, you provided three

1 supplemental materials considered lists, correct?

2 A. Correct.

3 Q. And the TCE ban wasn't listed on any of
4 those three supplemental materials considered
5 lists, correct?

6 A. Correct, it was not on those materials
7 considered.

8 MS. SILVERSTEIN: To the extent
9 Dr. Hatten relies on the TCE ban to change or
10 support any of his opinions, we reserve the
11 right to reopen this deposition as that was
12 undisclosed prior to your questioning.

13 MR. RUZICKA: I disagree. It's in his
14 report, page 9, that he looked at the proposed
15 total ban.

16 MS. SILVERSTEIN: Dr. Hatten testified
17 that the ban was not available and could not
18 be considered for his report. We can argue
19 about this later, but to the extent Dr. Hatten
20 offers any opinions about the TCE ban that are
21 not explicitly stated in his report, we
22 reserve the right to reopen this deposition.
23 Otherwise, I have no additional questions at
24 this time.

25 FURTHER EXAMINATION

1 BY MR. RUZICKA:

2 Q. Doctor, I have just one question.

3 On page 9 of your kidney cancer report,
4 the second-to-the-last sentence says, "Of note, TCE
5 is almost unanimously recognized as a cause of
6 kidney cancer in the scientific community, and the
7 EPA has proposed a total ban on the compound as
8 well as on PCE."

9 Did I read that correctly?

10 A. Yes, you read that correctly.

11 Q. So when you authored your kidney cancer
12 report on December 8th, 2024, was there a proposed
13 total ban of the compound by the EPA?

14 A. Yes. The final language had not been --
15 or the final document had not been released, but a
16 proposed rule had already been released, and I
17 reviewed and cited that in my report.

18 MR. RUZICKA: No other questions.

19 Thank you.

20 THE VIDEOGRAPHER: I'm assuming
21 nothing on the Zoom, from anybody on the Zoom?

22 MR. RUZICKA: No.

23 THE VIDEOGRAPHER: Okay. This will
24 conclude the deposition of Benjamin Hatten,
25 M.D. The time is 6:01 p.m. Mountain Time. We

1 are off the record.

2 (At 6:01 p.m. Mountain Time, the
3 deposition was concluded.)
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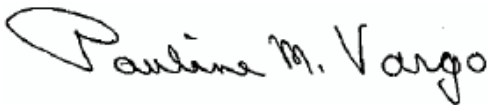
- CERTIFICATE OF CERTIFIED SHORTHAND REPORTER -

I, PAULINE VARGO, Certified Shorthand Reporter, Certified Realtime Reporter and Registered Professional Reporter, do hereby certify that prior to the commencement of the examination, BENJAMIN WALTER HATTEN, M.D., M.P.H., was duly sworn by me to testify to the truth, the whole truth and nothing but the truth.

I DO FURTHER CERTIFY that the foregoing is a verbatim transcript of the testimony as taken stenographically by me at the time, place, and on the date hereinbefore set forth, to the best of my ability.

I DO FURTHER CERTIFY that a review of the transcript was requested.

I DO FURTHER CERTIFY that I am neither a relative nor employee nor attorney nor counsel of any of the parties to this action, and that I am neither a relative nor employee of such attorney or counsel, and that I am not financially interested

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Please read your deposition over carefully and make any necessary corrections. You should state the reason in the appropriate space on the errata sheet for any corrections that are made.

After doing so, please sign the errata sheet and date it. It will be attached to your deposition.

It is imperative that you return the original errata sheet to the deposing attorney within thirty (30) days of receipt of the deposition transcript by you. If you fail to do so, the deposition transcript may be deemed to be accurate and may be used in court.

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E R R A T A

CASE NAME: IN RE: CAMP LEJEUNE WATER LITIGATION
DEPOSITION OF: BENJAMIN WALTER HATTEN, M.D., M.P.H.
DATE TAKEN: May 12, 2025

PAGE LINE CHANGE

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CASE NAME: CAMP LEJEUNE WATER LITIGATION
USDC, EASTERN DISTRICT OF
NORTH CAROLINA, No. 7:23-cv-00897

I hereby certify that I have read the
foregoing transcript of my deposition, given
on May 12, 2025, at the place aforesaid, and I
do again subscribe and make oath that the same is
a true, correct, and complete transcript of my
deposition so given as aforesaid, as it now appears.

BENJAMIN WALTER HATTEN, M.D., M.P.H. DATE

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before me this day
of , A.D. 20____.

Notary Public

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