

# Exhibit 177

IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF NORTH CAROLINA  
SOUTHERN DIVISION  
No. 7:23-CV-00897

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IN RE:

CAMP LEJEUNE WATER LITIGATION

This Document Relates to:

ALL CASES  
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EXPERT VIDEO-RECORDED DEPOSITION OF  
MICHAEL J. McCABE, JR., PHD

Friday, May 9, 2025

9:32 Eastern Time

Reported by: Denise Dobner Vickery, CRR, RMR  
JOB NO.: 7305935

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Friday, May 9, 2025

9:32 Eastern Time

Video-Recorded Deposition of MICHAEL  
J. McCABE, JR., PHD, held at the offices of:

U.S. DEPARTMENT OF JUSTICE  
1100 L Street NW  
Washington, DC 20005

Pursuant to notice, before Denise  
Dobner Vickery, Certified Realtime Reporter,  
Registered Merit Reporter, and Notary Public in  
and for the District of Columbia.

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2  
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3 ALSO PRESENT:

4 Bradley Loy, Videographer

5 Eron Miller, Paralegal, DOJ

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7 ALSO PRESENT VIA ZOOM:

8 Zina Bash, Esq. - Keller Postman

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P R O C E E D I N G S

- - -

THE VIDEOGRAPHER: We are now  
on the record.

My name is Bradley Loy. I am  
a videographer for Golkow, a Veritext  
division. Today's date is May 9, 2025.  
The time is 9:32.

This video deposition is being  
held at 1100 L Street, Northwest,  
Washington, DC in the matter of Camp  
Lejeune Water Litigation for the United  
States District Court for the Eastern  
District of North Carolina, Southern  
Division.

The deponent is Dr. Michael J.  
McCabe, Jr.

Will counsel please identify  
themselves.

MS. GJONAJ: Diana Gjonaj on  
behalf of Plaintiffs Leadership Group.

MS. GREENWALD: Robin  
Greenwald also Plaintiffs Leadership  
Group.

1 MS. McKEEVER: Traci McKeever  
2 for the United States.

3 MR. CROMWELL: Michael  
4 Cromwell for the United States.

5 MR. MILLER: Eron Miller for  
6 the United States.

7 THE VIDEOGRAPHER: The court  
8 reporter is Denise Vickery and will now  
9 swear in the witness.

10 - - -

11 MICHAEL J. McCABE, JR., PHD  
12 called for examination, and, after having been  
13 duly sworn, was examined and testified as  
14 follows:

15 - - -

16 EXAMINATION

17 - - -

18 BY MS. GJONAJ:

19 Q. Good morning, Dr. McCabe. I just  
20 introduced myself off the record, but my name is  
21 Diana Gjonaj. I'm with Weitz & Luxenberg and  
22 representing Plaintiffs Leadership Group.

23 Can you state your full name for the  
24 record, please.

1 A. Michael Joseph McCabe, Jr.

2 Q. Okay. Dr. McCabe did you bring any  
3 documents with you today?

4 A. I did not.

5 Q. You did not? Okay.  
6 Have you ever been deposed before?

7 A. Yes.

8 Q. Okay. So I'm assuming you know the  
9 drill, but if I ask any question that is unclear,  
10 you'll seek clarification; right?

11 A. Yes.

12 Q. Okay. And if you answer the  
13 question, I'll assume that you understood it, that  
14 question; correct? Fair?

15 A. Fair, yes.

16 Q. If at any point you need a break,  
17 just let me know. I just ask that if a question  
18 is pending, you answer the question, and then we  
19 can take a break anytime you need.

20 A. Understood.

21 Q. Okay. And you understand, of  
22 course, that you're under oath today just as if  
23 you were sitting before a judge and a jury?

24 A. I do.

1           Q.           And is there any reason, sitting  
2 here today, that you would not be able to testify  
3 truthfully, accurately, and completely?

4           A.           None.

5                       MS. GJONAJ: All right.

6           Marked Exhibit 1, which would be the  
7 plaintiffs' notice of deposition.

8                       (Document marked for  
9 identification as McCabe Exhibit 1.)

10 BY MS. GJONAJ:

11           Q.           And if you move -- flip to  
12 Attachment A -- or, first, have you seen this  
13 document before?

14           A.           (Reviews document.)

15                       I think so, yes.

16           Q.           Have you seen Attachment A that's  
17 requesting specific documents that you bring to  
18 the deposition?

19           A.           I think so, yes.

20           Q.           Okay. And have you provided  
21 everything responsive to those documents  
22 requested?

23           A.           I think so.

24           Q.           And you -- and what you produced are

1 a set of invoices; is that right?

2 A. A set of invoices were -- were  
3 produced for you on my behalf, yes.

4 Q. Okay. Great.  
5 Did you prepare for today's  
6 deposition?

7 A. Of course.

8 Q. And what did you do to prepare for  
9 the deposition?

10 A. Reflected on my opinions, read my  
11 reports, read some of the papers, reread --  
12 re-reviewed some of the papers in my report,  
13 reread some of Dr. Gilbert's reports, for example.  
14 By and large, that's what I did in preparation.

15 Q. Okay. Did you meet with any of the  
16 lawyers at the DOJ to prepare for today's  
17 deposition?

18 A. Yes.

19 Q. When did you meet with them?

20 A. This morning for a brief period of  
21 time. Yesterday for about four hours. Over the  
22 last week and a half prior to yesterday, I  
23 estimate three or four times by Zoom, a couple  
24 hours each time.

1           Q.       Okay. Have you met with any other  
2 lawyers about this case besides the lawyers at the  
3 DOJ?

4           A.       No.

5           Q.       Okay. And other than meeting with  
6 the lawyers and reviewing the documents that you  
7 stated, you didn't -- did you do anything else to  
8 prepare for today's deposition?

9           A.       Nothing really relevant that comes  
10 to mind.

11          Q.       Okay. Did you --

12          A.       Got a goodnight's sleep, had  
13 breakfast, but yeah, those types of things.

14          Q.       Did you speak to any of the other  
15 experts in this case?

16          A.       Prior to my deposition? No.

17          Q.       To prepare for your -- okay.

18          A.       No.

19                   MS. GJONAJ: All right. I'm  
20 going to mark as Exhibit 2. This is what  
21 I believe is your expert report in this  
22 case on non-Hodgkin's lymphoma and  
23 leukemia.

24                   (Document marked for

1 identification as McCabe Exhibit 2.)

2 THE WITNESS:

3 (Reviews document.)

4 BY MS. GJONAJ:

5 Q. If you turn to, I believe it's page  
6 71 or 72 of your statement, fair to say this is an  
7 accurate representation of the most up-to-date  
8 CV -- your most up-to-date CV?

9 A. Yes.

10 Q. All right. And it says that you  
11 received a PhD in biomedical studies with a focus  
12 on microbiology and immunology at Albany Medical  
13 College in 1991; is that correct?

14 A. Yes.

15 Q. And you obtained your master's  
16 degree in biomedical social studies from Albany  
17 Medical College in what year? I think I --

18 A. 1990. But it's not social studies,  
19 right, medical studies. Did you say social  
20 studies or did you misspeak?

21 Q. I thought I said biomedical studies  
22 but...

23 A. Yeah, got it.

24 Q. And are you currently affiliated



1 with any academic institutions?

2 A. Temple University.

3 Q. Okay. And how long have you been  
4 affiliated with Temple University?

5 A. Since approximately 2017.

6 Q. Okay. Are you currently  
7 board-certified in any scientific discipline?

8 A. No.

9 Q. And in your CV, I believe you list a  
10 number of publications; correct?

11 A. Yes.

12 Q. Are any of those publications  
13 specifically related to the water contamination at  
14 Camp Lejeune?

15 A. No.

16 Q. Have you ever presented at a  
17 conference or otherwise regarding contamination in  
18 the water at Camp Lejeune?

19 A. No.

20 Q. And from what I can tell, your  
21 research has primarily revolved around metal  
22 toxicology; is that correct?

23 A. Metal immunotoxicology, but yes.

24 Q. And it particularly focused on

1 elements like lead, mercury, and arsenic; is that  
2 accurate?

3 A. Correct.

4 Q. Okay. Have any of your published  
5 work pertained to TCE, PCE, benzene, or vinyl  
6 chloride?

7 A. Not directly.

8 MS. McKEEVER: Object to the  
9 form.

10 BY MS. GJONAJ:

11 Q. Pardon?

12 A. Not directly.

13 Q. Okay. So when you say "not  
14 directly," what do you mean by that?

15 A. I wasn't studying or my laboratory  
16 wasn't using TCE as a tool to promote changes in  
17 the immune system, but many of the changes in the  
18 immune system that are provoked by other toxic  
19 agents, like metals, are in some ways in some  
20 circumstances relevant to the same issues with TCE  
21 provocation of the immune system.

22 You're hearing me okay? Yeah.

23 Q. All right. And can you turn to page  
24 87, please.

1                   Is this the most -- so this seems to  
2 be a list of your expert testimony; is that  
3 correct?

4           A.       Yes.

5           Q.       And this list accurate as of today?

6           A.       No.

7           Q.       You've testified since producing  
8 this document?

9           A.       Yes.

10          Q.       Okay. In what case?

11          A.       Two cases. Both of them, to the  
12 best of my recollection, in the end of February.  
13 So two separate cases at the end of February.  
14 Both of them just happened to be in state court in  
15 South Carolina. Again, two separate cases, but  
16 both of them were dram shop cases where I  
17 testified on behalf of the defense in depositions.

18          Q.       Okay. And who is the defendant in  
19 that case?

20          A.       That I don't remember. I don't  
21 recall.

22          Q.       Was it --

23          A.       ABAR.

24          Q.       Oh, it was ABAR?

1 A. ABAR, yes.

2 Q. Okay. And who retained you in that  
3 case?

4 A. The defense attorneys in both cases,  
5 and I don't remember the names. Well, let's see.  
6 One attorney was by the name of Alex Joyner. That  
7 was in one case. The other case, the attorney  
8 that retained me, I believe his last name was  
9 Ethridge. Mike, Michael Ethridge.

10 Q. Okay. And following this  
11 deposition, will you be able to get us the date of  
12 that testimony along with the case names?

13 A. Yes.

14 Q. Yes? Okay.

15 All right. By my count, I think  
16 there are approximately 40 or 45 cases that you've  
17 testified in in the last four years.

18 Does that sound about right?

19 A. Yes.

20 Q. Have you ever testified before  
21 Congress?

22 A. No.

23 Q. Okay. Have you ever testified in a  
24 toxic tort case?

1           A.           Yes.

2           Q.           Which case?

3           A.           So one that comes to mind would be  
4 on page.   (Pause).

5                        Okay.   So, first of all, as I  
6 understand toxic tort cases, a toxic court case is  
7 an injury to a party or parties involved with  
8 toxic exposure.   So a lot of my cases involve  
9 that, but I don't know if they're exactly toxic  
10 tort case.

11                      The one that comes to mind that I  
12 think is most responsive to the question you're  
13 asking me about toxic tort case is on page 90,  
14 third case down.   1, 2, 3, 4.   Deborah Monnahan,  
15 et al., plaintiffs versus Modine Manufacturing  
16 Company, et al., defendants.   There are two dates  
17 there for deposition that was taken in that case.  
18 So this is a case in state court in Missouri and  
19 the trial for that case is on page 93, August 22,  
20 2023.

21           Q.           Okay.   Have you ever been involved  
22 in any cases -- or I'm sorry.

23                      Have you ever testified in any cases  
24 involving TCE?

1           A.           That case.   Yes.   (Laugh).

2           Q.           Okay.   How about PCE?

3           A.           I don't think PCE was involved.   No.

4           Q.           Benzene?

5           A.           I don't recall, but I don't think  
6   so.

7           Q.           Okay.   And have you ever been  
8   excluded as an expert witness?

9           A.           So I'll tell you about one.   My  
10   understanding is that in 2012 -- and I didn't find  
11   out about it until years later.   But in 2012, I  
12   wrote a report in a case federal court in  
13   Louisiana.

14                       I had -- in my report, I had  
15   provided three opinions, and my understanding is  
16   that the judge limited the court or struck, I  
17   guess, the third opinion because -- and, again, my  
18   understanding was that was done because the  
19   attorneys who had hired me didn't argue that  
20   opinion as part of their case in chief.   So it was  
21   determined to be -- my opinion was determined to  
22   be irrelevant.

23           Q.           Okay.   And what case was that?

24           A.           Hmm.   One of the parties was Turner.

1 I think that was the plaintiff in the case. I  
2 don't remember much else about it, other than what  
3 I told you. It was in federal court in Louisiana.  
4 It involved a wrongful termination issue for an  
5 individual, Mr. Turner, who was in a safety  
6 sensitive job function, prescribed and misusing  
7 opioids.

8 Q. Okay. Can you please describe your  
9 current role and responsibilities as principal  
10 scientist at Intertox?

11 A. Yes. I serve as a consultant expert  
12 in disciplines relevant to my expertise in  
13 immunology, toxicology, immunotoxicology, related  
14 disciplines, in providing really consulting and  
15 expert witness services to plaintiff and defense  
16 attorneys.

17 Q. Okay. And how long have you held  
18 that position?

19 A. Since April 1st of 2024.

20 Q. And before that, you were with  
21 Exigent; is that right?

22 A. Exigent.

23 Q. Exigent.

24 A. E-x-i-g-e-n-t.

1 Q. And how long were you there?

2 A. Oh, probably four -- approximately a  
3 little over four years.

4 Q. So around 2020?

5 A. December of 2019 --

6 Q. Okay.

7 A. -- was the start.

8 Q. Okay. And were your roles and  
9 responsibilities there similar to what you're  
10 doing at Intertox?

11 A. Yes, except that at Exigent I also  
12 served as the executive director of a small group  
13 of -- of experts. So I had oversight of --  
14 oversight of the work that all other experts were  
15 doing in the company.

16 Q. What is your current salary at  
17 Intertox?

18 [REDACTED]  
19 Q. And is that salary fixed or is it  
20 varied or -- well, strike that.

21 Can you tell me approximately what  
22 percentage of your total annual income comes from  
23 your salary at Intertox?

24 A. 75 percent.



1           Q.           And where does the other 25 percent  
2 come from?

3           A.           Non-salaried compensation at  
4 Intertox and my compensation from Temple  
5 University.

6           Q.           And when you say "non-salaried  
7 compensation," you mean bonuses?

8           A.           Yes.

9           Q.           Okay. What was the amount of the  
10 last bonus that you received from Intertox?

11 [REDACTED]

12           Q.           And are your bonuses in any way tied  
13 to the financial performance of Intertox?

14           A.           I don't know.

15           Q.           Do you have any idea how your  
16 bonuses are calculated?

17           A.           No.

18                       MS. GJONAJ: I'm going to go  
19 ahead and mark your reports, your kidney  
20 cancer and bladder cancer reports.

21                       (Document marked for  
22 identification as McCabe Exhibit 3.)

23                       MS. GJONAJ: Here's Exhibit 3.  
24 It's the kidney cancer report dated

1 February 7, 2025.

2 (Document marked for  
3 identification as McCabe Exhibit 4.)

4 BY MS. GJONAJ:

5 Q. And then marked as Exhibit 4 is your  
6 bladder cancer report dated, again, February 7,  
7 2025.

8 A. Thank you.

9 MS. GJONAJ: And then I also  
10 have an errata sheet. It's marked as  
11 Exhibit 5.

12 (Document marked for  
13 identification as McCabe Exhibit 5.)

14 THE WITNESS: Okay.

15 BY MS. GJONAJ:

16 Q. Are those the expert reports that  
17 you've submitted in this litigation?

18 A. Yes.

19 Q. Okay. And each has a signature on  
20 it.

21 Is that your signature?

22 A. Yes.

23 Q. Okay. Did you personally write this  
24 report?

1 A. I did.

2 Q. Or these reports?

3 A. Yes.

4 Q. Did anyone assist you in writing the  
5 reports?

6 A. Yes.

7 Q. Who helped?

8 A. The main person who helped was  
9 Dr. Heidi O'Neill.

10 Q. And who is Heidi O'Neill?

11 A. Heidi O'Neill is another PhD  
12 scientist toxicologist who works at Intertox.

13 Q. And when you say she helped, how did  
14 she help?

15 A. She helped in performing some  
16 research and in writing some sections of the  
17 report.

18 Q. Which sections of the report did she  
19 write?

20 A. So when I was -- in early January, I  
21 guess, when I was focused on writing the  
22 immunological, what I consider the immunology and  
23 immunotoxicology portions of the report, you know,  
24 at the time there was a January 23rd deadline. So

1 I pulled Heidi in to start doing some of the  
2 research and work that I thought would balance the  
3 report in terms of non-immunotoxic mechanisms of  
4 TCE, benzene, and PCE. So she -- so she assisted  
5 in writing and doing research for -- for those  
6 sections of the reports.

7 Q. Okay. And did she write those  
8 sections of the reports?

9 A. In part, yes, but ultimately all of  
10 the words are -- are essentially mine.

11 Q. Did anyone else at Intertox help you  
12 with these reports?

13 A. Again, early on. So the answer to  
14 that is yes.

15 Q. Who would that be?

16 A. So -- so what I consider early on,  
17 so early January I had two -- two other scientists  
18 at Intertox, Dr. Jerry -- Jerry -- sorry --  
19 Dr. Jeremy McMahon and Gretchen Bruce read drafts  
20 of the reports that I had going to see, you know,  
21 is this -- is this clear? Is it -- am I too much  
22 in the weeds? Am I just right? Give me some  
23 feedback.

24 So basically they were peer

1 reviewing my reports.

2 Q. Okay.

3 A. One other person -- and all these  
4 people, I believe, appear on the invoices. One  
5 other person, Kelly Hackney, master's level  
6 scientist at Intertox. I had her work on some  
7 graphics for me because she's talented in that  
8 way, and she was able to do something in a few  
9 hours that would have taken me weeks.

10 Q. Was there anyone else that helped  
11 draft these reports outside of Intertox?

12 A. No.

13 Q. Okay. And do these reports contain  
14 a complete and accurate statement of all the  
15 opinions you intend to offer in this case?

16 A. I think so, yes.

17 Q. And does -- do these reports fully  
18 detail the bases and reasons for each of your  
19 opinions?

20 MS. McKEEVER: Objection to  
21 form.

22 THE WITNESS: Again, yes, I  
23 think so.

24 BY MS. GJONAJ:

1 Q. And other than the corrections  
2 identified in the errata sheet, have you  
3 identified any other changes that you wish to make  
4 to these reports?

5 MS. McKEEVER: Objection to  
6 form.

7 THE WITNESS: Not -- to date,  
8 no, and not at this time.

9 BY MS. GJONAJ:

10 Q. All right. And you produced a list  
11 of materials that you have considered in reaching  
12 your opinions expressed in this in each of these  
13 reports; is that correct?

14 A. In each of my reports, yes, and if  
15 I'm understanding you, you're referring to page,  
16 for example --

17 Q. 57?

18 A. -- 63 in my bladder cancer report.

19 Q. Okay. Do all of the materials that  
20 you list there contain -- I'm sorry. Strike that.

21 Does the list that you contain in  
22 the back of each of these reports contain all the  
23 materials you considered in reaching the opinions  
24 that you expressed in your report?

1 MS. McKEEVER: Objection to  
2 form.

3 THE WITNESS:  
4 (Reviews document.)

5 Can I hear the question again?

6 Sorry.

7 BY MS. GJONAJ:

8 Q. You're on page? What page are you  
9 on in the bladder report?

10 A. In the bladder cancer report, I'm on  
11 page 67. No, I'm not on page 67. Apologize.  
12 Sorry. I'm on page 63.

13 Q. On page 63 and on 67.

14 So on 63, you have Case-Specific  
15 Documents Reviewed; correct?

16 A. Yes. Yes.

17 Q. And then on page 67, you have  
18 Literature Resources Reviewed, Considered, and  
19 Relied Upon; correct?

20 A. Yes.

21 Q. Between those two lists, do they  
22 contain all the materials you considered in  
23 reaching the opinions in your bladder cancer  
24 report?

1           A.           No. There's nothing I'm necessarily  
2    hiding, but 35 years of, you know, research and  
3    experience in this area that there's things I have  
4    reviewed in the past, but these are documents that  
5    I specifically reviewed for this case that I  
6    thought were representative in supporting the  
7    opinions or the factual basis of -- of issues in  
8    this case that I thought were relevant.

9           Q.           Okay. Have you read all of the  
10   documents on these lists?

11          A.           I think so. At least once.

12          Q.           And same question for the kidney  
13   cancer report and --

14          A.           Let me -- let me go back to that  
15   previous question.

16                        When I answered -- when I answered  
17   yes, I particularly was thinking in terms of  
18   what's on page 67 in the bladder cancer or starts  
19   on 67, which is the literature cited.

20          Q.           So you've read ever -- you believe  
21   you've read all the materials --

22          A.           Sure.

23          Q.           -- listed on --

24          A.           Yes.



1 Q. -- the list starting on page 67?

2 A. Yes. Yes.

3 Q. Okay. Same question for the list on  
4 page 63.

5 A. I think read many of them. Some of  
6 them were background that I skimmed that really  
7 were. They were provided to me that I did review  
8 sections of them, but I can't attest that I've  
9 read, for example, every word of the water quality  
10 reports.

11 Q. Okay. And you list a number of  
12 videotaped and videoconferenced depositions  
13 starting at 51.

14 Did you watch those video  
15 depositions?

16 A. Did not watch the videos. Read  
17 sections of the transcripts.

18 Q. Okay. And just to confirm, for the  
19 NHL and leukemia report, which I'll refer to as  
20 the blood cancer report, if that's okay with you?

21 A. The blood cancer report? Yes. Yes.  
22 Bless you.

23 Q. And the kidney cancer report?

24 A. Yes.

1 Q. Have you -- is that the same answer?

2 A. Same answer, yes.

3 Q. Thank you.

4 Have you reviewed the expert reports  
5 for the general causation -- have you reviewed the  
6 general -- strike that.

7 Have you reviewed the general  
8 causation expert reports of the plaintiffs'  
9 experts in this case?

10 MS. McKEEVER: Objection to  
11 form.

12 THE WITNESS: Some. The ones  
13 that I listed in my report, yes.

14 BY MS. GJONAJ:

15 Q. Okay. And have you reviewed any of  
16 the DOJ expert reports in this case besides your  
17 own, of course?

18 A. Yes.

19 Q. Which ones?

20 A. Dr. Goodman's report. Dr. Shields'  
21 reports. Dr. Lipscomb's report. Those are the  
22 ones that come to mind. I don't -- I don't recall  
23 if I looked at any others.

24 Q. Okay.

1           A.           I may have looked at some of DOJ's  
2     water quality reports but, again, that's something  
3     I would have skimmed on balance.

4           Q.           And for Dr. Goodman, did you review  
5     her blood cancer report, kidney cancer report, and  
6     bladder cancer report?

7                       MS. McKEEVER:   Objection to  
8     form.

9                       THE WITNESS:   Yes, I believe I  
10    did.

11   BY MS. GJONAJ:

12           Q.           When did you review those reports?

13           A.           I don't remember if it was late  
14    January, early February, as I sit here, but in  
15    that time frame.

16           Q.           So as you were drafting your report?

17           A.           Yes.

18           Q.           And did you review Dr. Goodman's  
19    report before finalizing your report?

20           A.           Yes.

21           Q.           How much time did you spend  
22    reviewing Dr. Goodman's reports?

23           A.           I don't remember that.   I can't  
24    answer that question.   I don't have -- I don't

1 have a recall of how much time I spent doing that.

2 Q. Approximately?

3 A. Yeah. Thing is, there was so much  
4 to review that I just -- I can't -- I can't parse  
5 that out in my mind. I don't -- I honestly don't  
6 know the answer to the question.

7 Q. More than an hour?

8 A. Sure. I think that's fair.

9 Q. More than three hours?

10 A. That I don't know. That I don't  
11 recall. I'm not saying it was more than three  
12 hours or less than hours. I just don't -- don't  
13 know.

14 Q. Could have been 10 hours?

15 A. No, I don't think I spent 30 hours  
16 looking at each one of her reports. So I don't --  
17 so less than 10 hours I think is fair.

18 Q. Less than five hours?

19 A. I just don't know.

20 Q. And Dr. Shields. You mentioned that  
21 you reviewed Dr. Shields' reports; correct?

22 A. Right. Well, he had just one  
23 report --

24 Q. Right.

1           A.           -- as I recall.

2           Q.           And when did you review Dr. Shields'  
3   report?

4           A.           Same time frame.

5           Q.           Okay. Of the general causation  
6   experts for plaintiffs, have you ever worked with  
7   any of these experts before?

8                       MS. McKEEVER: Objection to  
9   form.

10                      THE WITNESS: Tell me what  
11   you mean by have I worked with them.

12   BY MS. GJONAJ:

13           Q.           Have you ever worked with them in  
14   any litigation before?

15           A.           I don't think so.

16           Q.           Okay.

17           A.           I don't think so, no.

18           Q.           Have you ever been a plaintiffs --  
19   or strike that.

20                       Have you ever been an expert in a  
21   case where Dr. Goodman also served as an expert?

22           A.           I don't know. I don't remember if I  
23   did or didn't.

24           Q.           Okay. Have you ever met

1 Dr. Goodman?

2 A. Yes.

3 Q. When was the first time you met  
4 Dr. Goodman?

5 A. (Pause). Sometime before COVID. So  
6 before 2000. Sorry. Before 2020. Probably in a  
7 five-year period. My recollection is somewhere  
8 during a five-year period between 2013 and 2018, I  
9 met her at an SOT meeting, the Society of  
10 Toxicology meeting, at one of her posters.

11 That I met -- I took your question  
12 to mean met her physically in-person --

13 Q. Right.

14 A. -- not on Zoom.

15 Q. Did you meet her on Zoom before  
16 that?

17 MS. McKEEVER: Objection to  
18 form.

19 THE WITNESS: Well, nobody --  
20 nobody met on Zoom before that but --

21 BY MS. GJONAJ:

22 Q. Oh, right. Good point. Good point.

23 A. So no. (Laugh).

24 Q. Have you ever spoken to Dr. Goodman

1 regarding Camp Lejeune?

2 A. I talked to Dr. Goodman about her  
3 work on the Camp Lejeune case, yes.

4 Q. When did you first speak to her?

5 MS. McKEEVER: Objection to  
6 form.

7 BY MS. GJONAJ:

8 Q. Strike that.

9 When did you first speak to her  
10 regarding Camp Lejeune?

11 A. My recollection is sometime between  
12 November of 2024 and January of 2025, but I can't  
13 parse it out any better than that.

14 Q. And how many times have you spoken  
15 to Dr. Goodman regarding Camp Lejeune?

16 MS. McKEEVER: Objection to  
17 form.

18 THE WITNESS: Two for sure,  
19 maybe three.

20 BY MS. GJONAJ:

21 Q. How long were each of those  
22 conversations?

23 MS. McKEEVER: Objection to  
24 form.

1 THE WITNESS: Again, I'm  
2 guess -- I'm not guessing -- I'm not  
3 guessing. I'm estimating for you that  
4 those conversations were probably on the  
5 order of an hour.

6 BY MS. GJONAJ:

7 Q. So you've spoken to Dr. Goodman  
8 regarding the Camp Lejeune litigation two or three  
9 times for about an hour each time; is that  
10 correct?

11 A. Yes.

12 MS. McKEEVER: Objection to  
13 form.

14 THE WITNESS: To my  
15 recollection, yes.

16 BY MS. GJONAJ:

17 Q. Have you ever spoken to Dr. Shields  
18 regarding the Camp Lejeune litigation?

19 A. Yes.

20 Q. And how many times have you  
21 spoken --

22 A. I'm going to -- hold on. Hold on.  
23 I'm going to improve my answer for you.

24 When I said two or three, it was



1 definitely at least three for Dr. Goodman.

2 Q. Two to three times and you said --

3 A. Oh, no.

4 Q. I'm sorry. Three times.

5 A. Three. That's the point I'm making  
6 now.

7 Q. Got it.

8 And those conversations were in late  
9 2024?

10 A. November --

11 MS. McKEEVER: Objection to  
12 form.

13 THE WITNESS: Time frame of  
14 November 2024 to January 2025. My best  
15 recollection of when those took place.

16 BY MS. GJONAJ:

17 Q. Was anyone else part of those  
18 meetings?

19 A. Yes.

20 Q. Who?

21 A. DOJ attorneys.

22 Q. There were DOJ attorneys on each of  
23 those meetings?

24 A. Yes.

1 Q. Which DOJ attorneys?

2 A. Traci McKeever, Nancy Tinch, and  
3 others that I don't recall.

4 Q. And what was discussed at those  
5 meetings?

6 MS. McKEEVER: Objection. I'm  
7 going to instruct you not to answer.  
8 That's privileged information.

9 BY MS. GJONAJ:

10 Q. Are you taking counsel's instruction  
11 not to answer?

12 A. Yes.

13 Q. Have you ever spoken to any of Julie  
14 Goodman's colleagues at Gradient regarding this  
15 litigation?

16 MS. McKEEVER: Objection to  
17 form.

18 THE WITNESS: No.

19 BY MS. GJONAJ:

20 Q. Looking at your NHL report for the  
21 blood cancer report. You mention in this report  
22 that Dr. Gilbert had made "important contributions  
23 to the literature in this area."

24 Is that correct?

1           A.           Let's refer me to where. I think  
2           that's correct, but I'd like to see where. I'd  
3           just like -- would like to revisit where I said it  
4           in the report. I know what you're talking about.

5           Q.           Well, instead of flipping through,  
6           would you agree that Dr. Gilbert has made  
7           important contributions to the literature in the  
8           area of TCE?

9                       MS. McKEEVER: Objection to  
10           form.

11                      THE WITNESS: Well, again, I  
12           think the report would speak for itself  
13           as to what I said there.

14                      And what I recall, without  
15           flipping through and without you guiding  
16           me through where it is in the report, is  
17           that I think I said that Dr. Goodman has  
18           made important contributions to the  
19           scientific literature concerning the  
20           effects of TCE on the immune system,  
21           particularly in autoimmune diseased-prone  
22           mice.

23           BY MS. GJONAJ:

24           Q.           Okay. And you said Dr. Goodman.

1 Did you mean Dr. Gilbert?

2 A. I certainly did. (Laugh).

3 Q. Fair. I may mix the two of up today  
4 as well.

5 What contributions has she made?

6 MS. McKEEVER: Objection to  
7 form.

8 THE WITNESS: Let me give you  
9 the preamble here is that I met  
10 Dr. Gilbert at a conference on  
11 environmental contributions to autoimmune  
12 disease at a conference in 2003.

13 And one of the things that  
14 came out of that conference was  
15 discussing that or acting on the reality  
16 that autoimmune diseases are complex  
17 multifactorial diseases. Meaning that  
18 there's both extrinsic and intrinsic  
19 factors that contribute to the etiology  
20 of the disease.

21 Extrinsic meaning things like  
22 environmental agents like TCE or mercury.  
23 That I was working on mercury.  
24 Dr. Goodman -- sorry -- Gilbert. I'll

1 get it right. Dr. Gilbert was working on  
2 TCE and her colleague Sarah Blossom too.

3 So there's extrinsic factors  
4 like environmental chemicals. There's  
5 intrinsic factors like genetic background  
6 for certain genes that are tied, some of  
7 which we know, some of which we don't  
8 know, to the etiology of autoimmune  
9 disease complex diseases.

10 And scientists in toxicology  
11 and environmental medicine were very  
12 interested at the time, and still are, at  
13 gene-environment interactions in disease  
14 processes.

15 From the timing of that  
16 conference, maybe a little bit before,  
17 but certainly from the timing of that  
18 conference, Dr. Gilbert, in my view,  
19 picked up the mantel, if you will, and  
20 really started studying gene-environment  
21 interactions by virtue of studying TCE  
22 inducing, provoking frank autoimmunity in  
23 an autoimmune-prone mice.

24 So these are mice that are

1           genetically prone, but don't have the  
2           disease yet, and through her research,  
3           she was able to show that you can turn  
4           the disease on.

5                       So it's become a very  
6           interesting model to study disease  
7           processes. That's the area that Kathleen  
8           Gilbert made important contributions to  
9           over the next decades.

10       BY MS. GJONAJ:

11               Q.           So you would agree that Dr. Gilbert  
12       has made important contributions to the literature  
13       on TCE; correct?

14                       MS. McKEEVER:   Objection to  
15       form.

16                       THE WITNESS:     She's made  
17       important contributions to the literature  
18       on what I just said. The role of -- the  
19       intersection between TCE, the immune  
20       system, and autoimmune disease,  
21       particularly in autoimmune-prone mice.

22       BY MS. GJONAJ:

23               Q.           And that would include literature on  
24       TCE; correct?

1 MS. McKEEVER: Objection to  
2 form.

3 THE WITNESS: Well, by virtue  
4 that it contains one of those three  
5 things, sure.

6 BY MS. GJONAJ:

7 Q. Okay. Do you agree that Dr. Gilbert  
8 is a leading expert on the human health effects of  
9 TCE?

10 MS. McKEEVER: Objection to  
11 form.

12 THE WITNESS: Well, depends on  
13 what you mean by that. What -- what do  
14 you mean by that? Give me -- maybe you  
15 can rephrase it in a way that I'd be able  
16 to answer it better.

17 BY MS. GJONAJ:

18 Q. In your opinion --

19 A. Uh-huh.

20 Q. -- is Dr. Gilbert a leading expert  
21 on the human health effects of TCE?

22 MS. McKEEVER: Same objection.

23 THE WITNESS: Dr. Gilbert --  
24 well, I mean, you didn't really restate

1           your question. You just said it again.  
2           So I guess I will just run with what I  
3           understand your question to be.

4                     Dr. Gilbert - I consider her  
5           to be a leading expert in the areas that  
6           I've already described. She's a leading  
7           expert in understanding how an  
8           environmental chemical like TCE can  
9           provoke changes in the immune system that  
10          may be relevant -- changes in the immune  
11          system that lead -- lead to autoimmune  
12          disease in an autoimmune-prone mouse that  
13          may be relevant to human health effects.

14       BY MS. GJONAJ:

15                 Q.           Okay.

16                 A.           May be relevant to human health  
17          effects for human autoimmune disease.

18                 Q.           Okay. Dr. McCabe, are you aware  
19          that Dr. Gilbert has been repeatedly asked by  
20          federal agencies, including the National Research  
21          Council, National Academy of Sciences, National  
22          Toxicology Program, the Department of Defense, and  
23          the USEPA, to review the risk documents and  
24          regulatory assessments concerning TCE?



1 MS. McKEEVER: Objection to  
2 form and foundation. Go ahead.

3 THE WITNESS: I am aware of  
4 that by virtue of I think she states that  
5 in her reports.

6 BY MS. GJONAJ:

7 Q. Would you agree that being selected  
8 by multiple U.S. federal agencies to provide  
9 expert scientific review on TCE health effects is  
10 a strong indication that Dr. Gilbert is regarded  
11 as a leading authority on TCE?

12 MS. McKEEVER: Objection to  
13 form.

14 THE WITNESS: I don't have an  
15 answer to that. I don't know the answer  
16 to that.

17 BY MS. GJONAJ:

18 Q. Okay.

19 A. I don't know why -- I don't know why  
20 she was selected by those agencies to serve on --  
21 on those panels.

22 Q. And you're aware that Dr. Gilbert  
23 was an editor of a textbook on TCE published by  
24 Springer Humana Press?

1 MS. McKEEVER: Objection.

2 Objection to form and foundation.

3 You may answer.

4 THE WITNESS: I am aware of  
5 that. I'm aware -- I'm aware of the  
6 book. I'm aware of -- yes, I'm aware of  
7 that.

8 BY MS. GJONAJ:

9 Q. And she published countless studies  
10 on TCE; correct?

11 MS. McKEEVER: Objection to  
12 form.

13 THE WITNESS: Dr. Gilbert has  
14 published countless studies on the  
15 intersection between TCE, the immune  
16 system, and provocation of autoimmune  
17 disease in autoimmune-diseased prone  
18 mice.

19 BY MS. GJONAJ:

20 Q. Did you know that Dr. Gilbert served  
21 on the EPA scientific advisory -- advisory  
22 committee on chemicals from 2017 to 2021?

23 MS. McKEEVER: Objection to  
24 form.

1 THE WITNESS: I don't -- I  
2 think -- my -- my knowledge of that, I  
3 think you're correct based on what she  
4 wrote in her reports. That's my only  
5 knowledge of that, and what she said in  
6 her reports in that regard from my  
7 perspective would speak for itself. I  
8 don't have any independent knowledge of  
9 that.

10 BY MS. GJONAJ:

11 Q. Okay. Did you review Dr. Gilbert's  
12 CV?

13 A. Yes.

14 Q. What credentials would you require  
15 someone to have to be considered a leading expert  
16 on TCE that Dr. Gilbert does not have?

17 MS. McKEEVER: Objection to  
18 form.

19 THE WITNESS: None.

20 BY MS. GJONAJ:

21 Q. Can you tell me what contributions  
22 you have made on the literature on TCE?

23 A. None.

24 Q. Okay. Would you consider yourself a

1 leading expert on TCE?

2 MS. McKEEVER: Objection to  
3 form.

4 THE WITNESS: My expertise  
5 that's relevant to this case is my  
6 knowledge of -- well, short answer to  
7 your question is yes.

8 That I have expertise in TCE  
9 and the immune system. That my expertise  
10 lies in my deep understanding of the  
11 mechanisms of perturbation of the immune  
12 system by various chemicals, including  
13 TCE, for which, as documented in my own  
14 CV and in my expert report, demonstrates  
15 my expertise in the area.

16 BY MS. GJONAJ:

17 Q. You've never published a  
18 peer-reviewed study on TCE; correct?

19 A. No.

20 Q. Would you agree your primary role  
21 was to evaluate whether the immune system effects  
22 are a plausible mechanism by which these chemicals  
23 could cause cancer?

24 MS. McKEEVER: Objection to

1 form.

2 THE WITNESS:

3 (Reviews document.)

4 My role in this case -- my  
5 primary role in the case was the  
6 following:

7 The purpose of my  
8 investigation was to perform a complete  
9 independent and unbiased analysis to  
10 evaluate the immunotoxic effects of the  
11 VOCs, volatile organic chemicals, at  
12 issue in this case to determine whether  
13 modulation of the immune system is a  
14 relevant mechanism by which these  
15 chemicals can cause various cancers at  
16 issue.

17 BY MS. GJONAJ:

18 Q. And you're offering an opinion on  
19 whether TCE, PCE, benzene, or vinyl chloride do  
20 cause bladder cancer, kidney cancer, leukemia or  
21 NHL; is that correct?

22 MS. McKEEVER: Objection to  
23 form.

24 THE WITNESS: Correct. I

1 think that's fair.

2 Or do not cause those  
3 diseases. Either -- either way.

4 BY MS. GJONAJ:

5 Q. Correct?

6 A. Right.

7 Q. Okay. Fair.

8 So fair to say you're not offering  
9 your own opinion -- independent opinion as to the  
10 association of PCE, TCE, benzene, vinyl chloride,  
11 and the four cancers -- NHL, leukemia, bladder  
12 cancer, and kidney cancer -- generally?

13 MS. McKEEVER: Objection to  
14 form.

15 THE WITNESS: Correct.  
16 Correct, and I don't see that I indicated  
17 that in my report as a purpose nor did I  
18 provide those opinions or basis to same.

19 BY MS. GJONAJ:

20 Q. Understood.

21 And you mentioned that Dr. Goodman  
22 asserts in her report that the evidence does not  
23 support a causal association between NHL,  
24 leukemia, bladder cancer, kidney cancer, and the

1 four VOCs; correct?

2 MS. McKEEVER: Objection to  
3 the form.

4 THE WITNESS: That is  
5 correct. That is in my reports.

6 BY MS. GJONAJ:

7 Q. Okay.

8 A. Or --

9 Q. And --

10 A. Hang on. Sorry.

11 Language essentially similar to that  
12 is in each of my independent reports.

13 Q. Okay. And then you say that your  
14 "jumping in" point is to address whether it's  
15 biologically plausible that immunotoxicity caused  
16 TCE, PCE, benzene, or vinyl chloride in each of  
17 these cancers; is that right?

18 MS. McKEEVER: Objection to  
19 the form.

20 THE WITNESS: Can you tell me  
21 where on my report? I do want to read  
22 that for my own report. I can  
23 certainly --

24 BY MS. GJONAJ:

1           Q.       Do you recall saying that you had a  
2 "jumping in" point?

3           A.       I do.

4           Q.       What is that?

5           A.       I don't remember -- well, let me  
6 find it in my report.

7                   (Reviews document.)

8           Q.       Do you not recall what you meant by  
9 the "jumping in" point?

10          A.       Well --

11                   MS. McKEEVER:  Objection to  
12 form.

13                   THE WITNESS:  -- I'm trying to  
14 find it in my report because -- you want  
15 to go off the record for a minute or take  
16 a break?  Because I want to find it --

17 BY MS. GJONAJ:

18          Q.       Sure.

19          A.       -- in my report.

20                   THE VIDEOGRAPHER:  Stand by.

21                   We are off the record at

22 10:28.

23                   (A recess was taken.)

24                   THE VIDEOGRAPHER:  We are on



1           the record at 10:30.

2       BY MS. GJONAJ:

3           Q.       All right. Dr. McCabe, before we  
4       went off the record, I had asked you what you  
5       meant by the "jumping in point."

6           A.       Right.

7           Q.       Can you explain that?

8           A.       Yeah, but before you asked me that,  
9       you asked me if I would agree with the statement  
10      that you said about what I said in my report about  
11      "jumping in."

12                    So let me make the record clear that  
13      what I said in my report is that the "jumping in"  
14      place for me -- and this was in the context of  
15      indicating that both experts on plaintiff experts  
16      as well as defense experts were addressing the  
17      issues -- the epidemiological issues about  
18      causation between the exposure to the chemicals  
19      and the various diseases.

20                    And what I indicated was the  
21      "jumping in" place for me starts with addressing  
22      the question: How can TCE, PCE, benzene, and  
23      vinyl chloride alone or in combination either with  
24      one another cause NHL or leukemia or bladder

1 cancer or kidney cancer? Right?

2 So the "jumping in" place for me is  
3 on mechanism, how, and there's only two  
4 reasons -- well, I guess there's more than two  
5 reasons, but at least two reasons. Let me give  
6 you the first two reasons that come to mind as to  
7 why a scientist like me would address mechanism.

8 One would be if one endorses that  
9 the chemicals cause the disease, then you want to  
10 know how. That seems like a rationale follow-up  
11 question. Right?

12 But since I'm not endorsing that one  
13 way or another, right, consideration of how  
14 mechanism is also important because sometimes  
15 understanding mechanism of disease, as you  
16 probably know in the weight-of-the-evidence  
17 analysis, would inform whether a disease, in fact,  
18 occurs or not, right, aside from the  
19 epidemiological link.

20 The other reason for studying how in  
21 mechanism of the disease is based on things that I  
22 alluded to earlier is that you can learn a lot  
23 about the disease process, whatever the disease  
24 endpoint is itself, by tweaking it with various

1 chemicals, drugs, other biological -- biologically  
2 reactive comments.

3 That's what I meant by the "jumping  
4 in" place for me.

5 Q. Okay. Are you familiar with how  
6 EPA, IARC, and ATSDR define weight-of-the-evidence  
7 remarks?

8 MS. McKEEVER: Objection to  
9 form.

10 THE WITNESS: You know,  
11 vaguely. It's not -- it's not something  
12 that I -- I mean, it's not something that  
13 I do. Because my understanding of what  
14 regulatory agencies like IARC, EPA are  
15 doing is they're evaluating the science  
16 and the weight of the evidence of that  
17 science to set policies, which is  
18 different than what I'm doing -- it's  
19 different than what I do and different  
20 than what I do -- did in this case.

21 BY MS. GJONAJ:

22 Q. Okay. Would you agree that those  
23 agencies integrate multiple lines of evidence,  
24 including epidemiology, animal studies, and

1 mechanistic studies, to determine causation?

2 MS. McKEEVER: Objection to  
3 form.

4 THE WITNESS: To determine?  
5 Yeah, I'm not so sure they do it to  
6 determine causation, as much as they do  
7 it, as I said, to establish regulatory  
8 policies and -- and -- and protecting  
9 human health.

10 BY MS. GJONAJ:

11 Q. Okay. Is it okay with you if I  
12 refer to TCE, PCE, benzene, and vinyl chloride as  
13 the four VOCs?

14 A. Sure.

15 Q. Okay. Rather than repeating it?

16 A. Sure.

17 Q. Great.

18 Would you agree that to credibly  
19 opine that these four VOCs could not have caused  
20 leukemia, non-Hodgkin's lymphoma, kidney cancer or  
21 bladder cancer, you would need to evaluate all  
22 relevant lines of evidence?

23 MS. McKEEVER: Objection to  
24 form.

1 THE WITNESS: (Pause).

2 BY MS. GJONAJ:

3 Q. I'm going to strike that question.

4 Would you agree that to credibly  
5 opine that these four VOCs could not have caused  
6 leukemia, NHL, kidney cancer, bladder cancer, you  
7 would need to evaluate all relevant lines of  
8 evidence, including human, animal, and  
9 mechanistic?

10 MS. McKEEVER: Objection to  
11 form.

12 THE WITNESS: Sorry. I want  
13 to hear it again.

14 BY MS. GJONAJ:

15 Q. In order to -- okay. Let me break  
16 it down by disease. Maybe that it will make it  
17 easier.

18 Would you agree to credibly opine  
19 that these four VOCs could have caused leukemia,  
20 you would need to evaluate human, animal, and  
21 mechanistic data?

22 MS. McKEEVER: Same objection.

23 THE WITNESS: I don't know  
24 the answer to that or I can't answer it

1           because that's not what I did in this  
2           case. Right?

3 BY MS. GJONAJ:

4           Q.        Okay.

5           A.        I mean, I think we already  
6           established that I didn't offer that opinion.

7                    So inasmuch as what you're saying,  
8           you know, my first watch, sounds good. Just  
9           hadn't really thought about it. So I don't know  
10          that I'd want to go on the record and say, oh, I  
11          agree with that, without -- without thinking about  
12          it more. Because it's not --

13          Q.        Fair --

14          A.        -- something I did in this case.

15          Q.        You reviewed Dr. Goodman's reports;  
16          correct?

17          A.        Yes.

18          Q.        Is that what she did in her reports?

19                    MS. McKEEVER: Objection to  
20          form.

21                    THE WITNESS: Seemingly, yes.  
22          Yeah. Seemingly, yes.

23                    I mean, I think you asked me  
24          before questions about, yeah, I've known

1           about Dr. Gilbert and her work for a long  
2           time. As I indicated to you, I don't --  
3           I don't know of her. To me she's not,  
4           but I don't know of her, for example, as  
5           being an epidemiologist. Right? So --  
6           so --

7 BY MS. GJONAJ:

8           Q.           But my -- let me stop you there. My  
9           question was regarding Dr. Goodman.

10                       Did Dr. Goodman --

11           A.           Oh, I keep getting Gilbert and  
12           Goodman.

13           Q.           I'll ask it again.

14           A.           So let's make sure that --

15           Q.           Okay. Yeah. All right.

16           A.           -- I'm getting it straight. I'm  
17           sorry.

18           Q.           And -- okay.

19           A.           Sorry.

20           Q.           You mentioned that you reviewed  
21           Dr. Goodman's reports; correct?

22           A.           Yes.

23           Q.           And did Dr. Goodman review all  
24           human -- strike that.

1                   Did Dr. Goodman review human,  
2 animal, and mechanistic data before coming to her  
3 opinions --

4                   MS. McKEEVER: Objection.

5 BY MS. GJONAJ:

6           Q.       -- in her report?

7           A.       Gotcha. Sorry. I was --

8                   MS. McKEEVER: Objection to  
9 form.

10                  THE WITNESS: I was going in  
11 a completely different direction than  
12 that. I apologize for that.

13                  I don't know the answer to  
14 that. I think what Dr. Goodman did or  
15 didn't do in -- in -- in her reports and  
16 in her analysis will speak for itself. I  
17 don't have -- I don't know one way or  
18 another.

19                  I didn't focus on -- on that  
20 aspect of what Dr. Goodman was doing in  
21 my analysis of her -- in my review of her  
22 reports.

23                  And I guess the other thing to  
24 say about that in answering your root



1           question is that the determination of  
2           whether these -- or the evaluation of  
3           these chemicals, whether or not they  
4           cause the various disease endpoints,  
5           could come from the collective.

6       BY MS. GJONAJ:

7           Q.           Okay.

8           A.           The collective. The collective  
9           scientists working on the -- the analysis and on  
10          the issues.

11          Q.           Okay. I'm going to go back and ask  
12          the same question regarding NHL.

13                       Okay. Would you agree that to  
14          credibly opine that these four VOCs could have  
15          caused NHL, you would need to evaluate human,  
16          animal, and mechanistic data?

17                       MS. McKEEVER: Objection to  
18          form.

19                       THE WITNESS: So, again, I  
20          don't -- I don't -- I don't have an  
21          opinion on that. It's not something I  
22          did in this case and I don't -- I don't  
23          know.

24       BY MS. GJONAJ:

1 Q. Same question regarding kidney  
2 cancer. Same answer?

3 A. Yes.

4 MS. McKEEVER: Same objection.

5 BY MS. GJONAJ:

6 Q. And regarding bladder cancer?

7 MS. McKEEVER: Same objection.

8 THE WITNESS: Yes.

9 BY MS. GJONAJ:

10 Q. And in Dr. Goodman's kidney cancer  
11 report, did she review epidemiological studies?

12 MS. McKEEVER: Objection to  
13 form.

14 THE WITNESS: I believe she  
15 did, yes.

16 BY MS. GJONAJ:

17 Q. So do you know if Dr. Goodman  
18 reviewed human, animal, and mechanistic studies in  
19 her opinion cancer report?

20 MS. McKEEVER: Objection to  
21 form.

22 THE WITNESS: As I sit here,  
23 I don't. I don't -- I don't know any --  
24 I don't know the details of what she did

1 in that regard.

2 And as I indicated in my  
3 report, particularly on -- on my blood  
4 cancer report, particularly on page 6,  
5 prior to the "jumping in" sentence, I  
6 told you about what I -- what I was  
7 relying on from Dr. Goodman and others.

8 BY MS. GJONAJ:

9 Q. Dr. Goodman was retained by the DOJ  
10 in this litigation; correct?

11 A. That's my --

12 MS. McKEEVER: Objection to  
13 form and foundation.

14 THE WITNESS: That's my -- I  
15 don't -- I guess. I assume so.

16 BY MS. GJONAJ:

17 Q. And the reports that we are  
18 reviewing -- we are referring to regarding the  
19 Goodman reports are not peer reviewed or published  
20 in any scientific journal; correct?

21 MS. McKEEVER: Objection to  
22 form.

23 THE WITNESS: I don't know  
24 the answer to that.

1 BY MS. GJONAJ:

2 Q. We're talking about the reports that  
3 she and her team prepared for this case.

4 MS. McKEEVER: Same objection.

5 BY MS. GJONAJ:

6 Q. Would you agree?

7 A. So I don't know the answer to that.

8 Q. Okay. The reports that you reviewed

9 --

10 A. Uh-huh.

11 Q. -- are reports that Dr. Gilbert and  
12 her team have prepared for this litigation --

13 MS. McKEEVER: Objection.

14 BY MS. GJONAJ:

15 Q. -- is that correct?

16 MS. McKEEVER: Objection to  
17 form.

18 THE WITNESS: That's my  
19 understanding. Correct.

20 MR. CROMWELL: You're saying  
21 Dr. Gilbert.

22 MS. McKEEVER: You're saying  
23 Gilbert.

24 MS. GJONAJ: Oh, I did? Thank

1           you. (Laugh). I appreciate it.

2                           (Laugh).

3                           MR. CROMWELL: Without that,  
4           form.

5                           MS. GJONAJ: I appreciate  
6           that.

7 BY MS. GJONAJ:

8           Q. All right. I'll try not to make  
9           that mistake.

10          A. You know -- you know the worst thing  
11          is that I still heard Goodman. Right?

12                           (Laugh).

13          Q. Yeah. Yeah. Yeah.

14                           MR. CROMWELL: Acknowledge  
15          your answer.

16                           THE WITNESS: Yeah. Yeah,  
17          yeah. All right. Okay.

18                           MS. GJONAJ: Okay. We can  
19          move on. Thank you. I can't say I won't  
20          do that again.

21                           THE WITNESS: Yeah, me either.

22 BY MS. GJONAJ:

23          Q. All right. And you did not  
24          independently evaluate the epidemiological studies

1 Dr. Goodman cites in her reports; is that correct?

2 MS. McKEEVER: Objection to  
3 form.

4 THE WITNESS: Or that any of  
5 the experts, plaintiff side or -- or DOJ  
6 side, were -- were -- were reviewing and  
7 opining on in their respective reports.

8 BY MS. GJONAJ:

9 Q. Do you agree that Dr. Goodman in her  
10 report ultimately reaches a finding that the  
11 scientific evidence as a whole does not support a  
12 causal association between TCE and NHL?

13 MS. McKEEVER: Objection to  
14 form.

15 THE WITNESS: Are you  
16 referring to -- specifically to a finding  
17 or opinion that she stated in her report?  
18 And if so, I think I would like to see  
19 that before I agree with you that that's  
20 what she said. Otherwise, my answer is  
21 that document will speak for itself.

22 MS. GJONAJ: I'm marking as  
23 Exhibit 6 a report titled  
24 "Trichloroethylene, Perchloroethylene

1 Benzene, Vinyl Chloride, and  
2 trans-1-2-DCE Exposure and NHL Risk"  
3 prepared by Julie Goodman dated  
4 February 7, 2025.

5 (Document marked for  
6 identification as McCabe Exhibit 6.)

7 THE WITNESS:

8 (Reviews document.)

9 BY MS. GJONAJ:

10 Q. If you flip to page 64. Can you  
11 read the last sentence on page 64, please?

12 A. I -- out loud? Onto the record?

13 Q. Please.

14 A. Here you go.

15 "I conclude that while there is some  
16 evidence for a positive association in  
17 epidemiology studies, scientific evidence as a  
18 whole does not support a causal association  
19 between TCE and NHL."

20 Q. And do you recall if Dr. Shields  
21 agreed with those opinions?

22 MS. McKEEVER: Objection.

23 I'm going to instruct you not  
24 to answer to the extent it covers any

1 privileged conversations.

2 THE WITNESS: I'll follow her  
3 lead.

4 BY MS. GJONAJ:

5 Q. You reviewed Dr. Shields' reports;  
6 correct?

7 A. Yes.

8 Q. Did Dr. Shields find there to be a  
9 causal association between TCE and NHL?

10 MS. McKEEVER: Objection to  
11 form.

12 THE WITNESS: I don't believe  
13 that he did. I believe he did not.

14 BY MS. GJONAJ:

15 Q. Okay.

16 A. I believe he gave an opinion to that  
17 effect.

18 MS. GJONAJ: Okay. We'll come  
19 back to that.

20 (Document marked for  
21 identification as McCabe Exhibit 7.)

22 BY MS. GJONAJ:

23 Q. Okay. I just marked as Exhibit 6  
24 or -- I'm sorry -- that's Exhibit 7; correct?



1 A. Yes.

2 Q. And I will represent that these are  
3 a compilation of excerpts from several different  
4 agency publications relating to TCE, PCE, benzene  
5 and NHL, and any highlighting in the documents  
6 were not in the original documents. Those were  
7 added by me.

8 A. (Reviews document.)

9 Q. And on that first page is the ATSDR  
10 Assessment of Evidence for the Drinking Water  
11 Contaminants at Camp Lejeune and Specific Cancers  
12 and Other Diseases dated January 2017.

13 Have you seen this document before?  
14 Or is that correct?

15 A. Yes.

16 Q. Have you seen this document before?

17 A. Yes.

18 Q. Okay. And they were looking at the  
19 drinking water and the associated -- drinking  
20 water at Camp Lejeune and the association with  
21 cancers; is that correct?

22 A. Yes.

23 MS. McKEEVER: Objection to  
24 form.

1 THE WITNESS: My  
2 understanding of what it was, yes.

3 BY MS. GJONAJ:

4 Q. On the next page, I have excerpted  
5 page 34. Can you please read the conclusion that  
6 I have highlighted there?

7 A. Based on the meta --

8 "Conclusion: Based on the  
9 meta-analyses, the study of NHL subtypes (Cocco et  
10 al. 2013), and the mechanistic evidence that TCE  
11 causes immunosuppression which is a risk factor  
12 for NHL, ATSDR concludes that there is sufficient  
13 evidence for causation for TCE and NHL."

14 Q. Did you review the Cocco study  
15 referenced here?

16 A. Not that I recall as I'm -- I don't  
17 remember the Cocco study by -- the answer is I  
18 don't know. I'm not remembering. Cocco et al.  
19 2013 is not triggering my memory. There you go.  
20 (Laugh).

21 Q. And the ATSDR here also mentioned  
22 that "TCE causes immunosuppression which is a risk  
23 factor for NHL"; correct?

24 A. It's correct that the document says

1     that, yes.

2             Q.           Do you agree with that?

3                         MS. McKEEVER:   Objection to  
4             form.

5                         THE WITNESS:    I agree -- so  
6             there's three components that which I can  
7             readily agree to two of them, but not the  
8             third.

9                         So the first one is that TCE  
10            causes immunosuppression, yes, that's  
11            true under certain circumstances.

12                        The second part of that,  
13            immunosuppression is a risk factor for  
14            NHL, and the answer to that is yes, under  
15            certain circumstances.

16                        The part that I don't agree  
17            to, and I think I described in my report  
18            why I wouldn't agree with it, is the  
19            summation that, therefore, there's  
20            sufficient evidence for causation for TCE  
21            and NHL.

22                        There may have been for the  
23            purposes of ATSDR in this document to tie  
24            those three things together, but from my

1 work in this case, I don't -- I don't  
2 agree with that.

3 BY MS. GJONAJ:

4 Q. If you flip to the next page, it's  
5 the Toxicological Profile for Trichloroethylene in  
6 June 2019; is that right?

7 A. Sorry. Cheater. Reading glasses.  
8 June 2019 ATSDR tox profile for  
9 trichloroethylene. That's what I'm looking at,  
10 yes.

11 Q. And if you flip, the page we've  
12 excerpted page 4. Can you read the highlighted  
13 text there?

14 A. (Reviews document.)

15 Yeah. Context is that there the  
16 rest of the paragraph is addressing the findings  
17 and the positions of regulatory agents like IARC  
18 and the EPA, USEPA, and the sentence is, is that:

19 "There is also some evidence of an  
20 association between trichloroethylene exposure and  
21 non-Hodgkin's lymphoma in humans."

22 Q. Okay. You flip to the next page,  
23 please.

24 It's the Toxicological Review of

1 Trichloroethylene dated August 2011 by the EPA --

2 A. Yep.

3 Q. -- is that correct?

4 A. Correct.

5 Q. And now we've excerpted page 4-676.

6 A. Okay.

7 Q. Can you please read the highlighted  
8 text under the Characterization of  
9 Carcinogenicity?

10 A. (Reviews document.)

11 Q. Can you please read it aloud?

12 A. I wanted to read it first, and so  
13 then I'll read it out loud so I understand what  
14 I'm reading into the record.

15 So two highlighted sections of this  
16 document on page 4676 under section 4.11.12  
17 Characterization of Carcinogenicity and the first  
18 highlighted sentence is as follows:

19 "Following EPA (reference 2005b)  
20 Guidelines for Carcinogen Risk Assessment, TCE is  
21 characterized as carcinogenic to humans by all  
22 routes of exposure."

23 And then there's a couple of  
24 sentences and the following highlighted sentence:

1                   "The human evidence of  
2   carcinogenicity from epidemiologic studies of TCE  
3   exposure is strong for NHL but less convincing  
4   than for kidney cancer and more limited for liver  
5   and bill -- biliary tract cancer."

6           Q.           So the Toxicological Review of TCE  
7   in August 2011 found that epidemiological studies  
8   of TCE exposure is strong for NHL?

9                   MS. McKEEVER:  Objection.

10   BY MS. GJONAJ:

11           Q.           Do you agree with that?

12                   MS. McKEEVER:  Objection to  
13   form.

14                   THE WITNESS:  Well, I think it  
15   speaks for itself.  It says what they  
16   found and what I read into the record:  
17   That it's strong, but less convincing  
18   than that of kidney cancer.

19   BY MS. GJONAJ:

20           Q.           The next page is the Risk Evaluation  
21   for TCE dated November 2020 from the EPA?

22           A.           Yes.

23           Q.           Have you seen this document before?

24           A.           Yes.

1           Q.           And if you could please read the  
2 summary at the top of the page.

3           A.           (Reviews document.)

4                       Okay. It's on page 252 of 803, top  
5 of the page. Starts as following or says as  
6 following:

7                       "In summary, meta-analyses  
8 accounting for between study heterogeneity,  
9 influential observations, and data quality  
10 consistently indicate positive associations of  
11 NHL, kidney cancer and liver cancer with exposure  
12 to TCE. This conclusion generally agrees with  
13 that of other governmental and international  
14 organizations. The International Agency for  
15 Research on Cancer (IARC) (IARC, 2014) found  
16 sufficient evidence for the carcinogenicity of TCE  
17 in humans. IARC definitively stated that TCE  
18 causes kidney cancer and determined that a  
19 positive association -- that a positive  
20 associated" -- probably should be  
21 association -- "has been identified for NHL and  
22 liver cancer. Based on the weight of evidence  
23 when accounting for both these authoritative  
24 assessments and the results of EPA's meta-analyses

1 and in accordance with EPA Guidelines for Cancer  
2 Risk Assessment (USEPA, 2005), EPA determines that  
3 TCE is 'Carcinogenic to Humans.'

4 Q. So the EPA in the 2020 Risk  
5 Evaluation on TCE acknowledged that there's a  
6 positive association between TCE and NHL; is that  
7 correct?

8 MS. McKEEVER: Objection to  
9 form.

10 THE WITNESS: Well, again,  
11 they -- they -- the document speaks for  
12 itself, as I just read into the record,  
13 as to the basis for that they're  
14 determining that there is a positive  
15 association between TCE exposure and NHL,  
16 yes.

17 BY MS. GJONAJ:

18 Q. All right. The next document  
19 excerpted is the IARC Monograph on  
20 Trichloroethylene and Tetrachloroethylene and  
21 Other Chlorinated Agents.

22 Would you agree with that?

23 A. Yeah, I believe this is the 2014  
24 IARC Monograph that was referenced earlier in the



1 EPA --

2 Q. Okay. And is that --

3 A. -- the EPA blurb that I read.

4 Q. Right.

5 And it says this publication  
6 represents the views and expert opinions on an  
7 IARC working group on evaluations of the  
8 carcinogenic risks to humans which met in Lyon,  
9 October 2012; correct?

10 A. Leone, yeah.

11 Q. Leone.

12 A. They met in 2012, yes.

13 Q. Okay. And flipping to page 189  
14 under the section that says "Cancer in Humans."

15 A. Oh.

16 Q. They say:

17 "A positive association has been  
18 observed between exposure to trichloroethylene and  
19 non-Hodgkin's lymphoma and liver cancer."

20 Did I read that right?

21 A. You did.

22 Q. Okay. Okay. I'm going to skip to:  
23 Dr. Goodman found that there was no causal  
24 association between PCE and NHL; is that correct?

1 MS. McKEEVER: Objection to  
2 form.

3 THE WITNESS: Offhand I don't  
4 know that. Again, sounds -- sounds  
5 right, but Dr. -- what Dr. Goodman did  
6 and the opinions that she gave in her  
7 report would speak for itself.

8 BY MS. GJONAJ:

9 Q. Okay. Do you recall if Dr. Goodman  
10 found a causal association between any of the VOCs  
11 at Camp Lejeune and NHL?

12 MS. McKEEVER: Objection to  
13 form.

14 THE WITNESS: I don't think  
15 she did.

16 BY MS. GJONAJ:

17 Q. Okay. Back to this Exhibit 7 and,  
18 again, we're at the ATSDR Assessment of Evidence  
19 for the Drinking Water Contaminants at Camp  
20 Lejeune and Specific Cancers and Other Diseases.

21 A. Right. We're on the front -- the  
22 front page of the document again? Yeah, got it.

23 Q. I'm just referencing what page I'm  
24 excerpting next, and I've excerpted page 35 and it

1       says:

2                       "Based on the" --

3           A.       Sorry.

4           Q.       Are you there?

5           A.       I'm not -- I'm not with you.

6           Q.       No problem.

7           A.       And it's falling apart. If anybody  
8 has a stapler on a break, that would be super.

9           Q.       I brought it.

10                   MS. McKEEVER: In preparation?

11                   MS. GJONAJ: For all of it.

12                   THE WITNESS: Page you're --  
13 so just where I'm with you, you're back  
14 to the ATSDR Assessment of the Evidence  
15 for Drinking Water Contaminants at Camp  
16 Lejeune, and you're referencing page 35,  
17 which I don't have.

18 BY MS. GJONAJ:

19           Q.       If you flip about eight pages or so  
20 in.

21           A.       Gotcha. All right. Ah. Now I'm  
22 with you.

23           Q.       Thank you.

24                   And I'm reading from page 35, the

1 Conclusion. It says:

2 "Based on the epidemiological  
3 evidence, ATSDR concludes that there is equipoise  
4 and above evidence for causation for PCE and NHL."

5 Did I read that correctly?

6 A. You did.

7 Q. Okay. The next page is the  
8 Toxicological Profile for PCE June 2019 from the  
9 ATSDR.

10 We've seen this document already;  
11 correct?

12 A. Yes. Yes.

13 No. I have seen this before, but we  
14 haven't talked about it here. I may have  
15 misunderstood your question.

16 Q. Okay.

17 A. Ask me again.

18 Q. Okay.

19 A. So we have --

20 Q. Have you seen this document before?

21 A. Yes.

22 Q. Thank you.

23 Could you please read what I have  
24 highlighted on pages 3 and 4?

1           A.           (Reviews document.)

2                       "Exposure to tetrachloroethylene for  
3 a long time (years) may lead to a higher risk of  
4 getting cancer, but the type of cancer that may  
5 occur is not well-understood. Studies in humans  
6 suggest that exposure to tetrachloroethylene may  
7 lead to a higher risk of getting bladder cancer,  
8 multiple myeloma, or non-Hodgkin's lymphoma."

9           Q.           So, again, the ATSDR in 2019 has  
10 said that PCE can lead to a higher risk of getting  
11 NHL; is that correct?

12                       MS. McKEEVER: Objection to  
13 form.

14                       THE WITNESS: Yes.

15 BY MS. GJONAJ:

16           Q.           Next page is the Toxicological  
17 Review of PCE dated February 12th from the EPA,  
18 and this is in Support of the Summary of  
19 Information on the Integrated Risk Information  
20 System; is that right?

21           A.           IRIS, yes.

22           Q.           Have you seen this document before?

23           A.           Yes.

24           Q.           And could you skipping -- skipping

1 to that second highlighted section there, could  
2 you please read that for me on page 6-13?

3 A. So you want me to read the second  
4 one. Right? Is that what I understood you?

5 Q. Correct.

6 A. Yep.

7 "The available epidemiologic studies  
8 provide a pattern of evidence associating  
9 tetrachloroethylene exposure and several types of  
10 cancer, specifically bladder cancer, non-Hodgkin's  
11 lymphoma, and multiple myeloma."

12 Q. So, again, the EPA back in 2012  
13 confirmed that there was evidence associating PCE  
14 exposure and NHL; correct?

15 MS. McKEEVER: Objection to  
16 form.

17 THE WITNESS: Yes, that's  
18 what the document says. In essence,  
19 that's what the document says.

20 BY MS. GJONAJ:

21 Q. Okay. Now, the 2020 EPA Risk  
22 Evaluation for TCE, looking at page 329 of 714,  
23 the EPA states:

24 "There is a pattern of

1 epidemiological evidence associating PCE exposure  
2 with NHL."

3 Did I read that correctly?

4 A. You did.

5 Q. And Dr. Goodman also did not find a  
6 causal association between benzene exposure and  
7 NHL; is that correct?

8 MS. McKEEVER: Objection to  
9 form.

10 THE WITNESS: Again, what she  
11 did and what she opined on will speak --  
12 what she did, she'll speak for herself,  
13 and I think her reports will speak for  
14 themselves, but I believe you're correct  
15 that that's what her opinion was.

16 BY MS. GJONAJ:

17 Q. Okay.

18 A. That's my recollection.

19 Q. And I'm reading from page 36 of the  
20 ATSDR Assessment of Evidence for the Drinking  
21 Water Contaminants at Camp Lejeune. The  
22 Conclusion states:

23 "Although IARC concluded that human  
24 evidence for causation for benzene and NHL was

1 limited, three recent large cohort studies have  
2 found positive associations. Based on the recent  
3 epidemiological evidence and the supporting  
4 evidence for mechanistic animal studies, ATSDR  
5 concludes that there is sufficient evidence for  
6 causation for benzene and NHL."

7 Did I read that correctly?

8 A. Yes.

9 Q. The next document is a document from  
10 the National Academy of Sciences.

11 Have you seen this document before?

12 A. I may have. I just don't recall, as  
13 I sit here, if I've seen this one before.

14 Q. And this is a 2003 document, and if  
15 you turn to page 289.

16 A. Got it.

17 Q. I'm reading:

18 "The committee concludes from its  
19 assessment of the epidemiologic literature that  
20 there is limited/suggested evidence of an  
21 association between chronic exposure to benzene  
22 and non-Hodgkin's lymphoma."

23 Did I read that correctly?

24 A. You did.



1 Q. And now I'm looking at the IARC  
2 Monograph in 2012.

3 You've seen this document before;  
4 correct?

5 A. (Reviews document.)

6 Yes.

7 Q. Reading from page 285.

8 "There is sufficient evidence in  
9 humans for the carcinogenicity of benzene.  
10 Benzene causes acute myeloid leukemia and acute  
11 nonlymphocytic leukemia. Also a positive  
12 association has been observed between exposure to  
13 benzene and acute lymphocytic leukemia, chronic  
14 lymphocytic leukemia, multiple myeloma, and  
15 non-Hodgkin's lymphoma."

16 Is that correct?

17 A. That's what it says.

18 MS. McKEEVER: Objection to  
19 form.

20 THE WITNESS: That's --  
21 you've read --

22 BY MS. GJONAJ:

23 Q. Did I read that correctly?

24 A. Yes.

1 Q. Thank you.

2 And is chronic lymphocytic leukemia  
3 considered a NHL subtype?

4 A. Yes. Sorry. Chronic lymphocytic  
5 leukemia is a form of non-Hodgkin's lymphoma, yes.

6 Q. And I'm turning to the IARC  
7 Monograph Benzene Volume 120. 2018.

8 A. Page 297?

9 Q. Correct.

10 A. All right.

11 Q. Have you seen this document before?

12 MS. McKEEVER: Do you need to  
13 staple it?

14 THE WITNESS: Yeah, I'm going  
15 to get there.

16 Yes.

17 BY MS. GJONAJ:

18 Q. Okay. Reading from page 297.

19 There is sufficient evidence in  
20 humans for the carcinogenicity of benzene.  
21 Benzene causes acute myeloid leukemia in humans.  
22 Positive associations have been observed for  
23 non-Hodgkin's lymphoma, chronic lymphoid leukemia,  
24 multiple myeloma, chronic myeloid leukemia, acute

1 myeloid leukemia in children and cancer of the  
2 lung. A small minority of the working group  
3 considered that benzene also causes non-Hodgkin's  
4 lymphoma."

5 Did I read that correctly?

6 A. Close. In the second sentence you  
7 said it said "benzene causes acute myeloid  
8 leukemia in humans." It says "in adults."

9 Q. Fair. Thank you.

10 A. Just so you know I'm paying  
11 attention.

12 Q. (Laugh). Appreciate it. All right.

13 A. Give me a second to put this back  
14 together, if you would be so kind.

15 MS. McKEEVER: We've been  
16 going about an hour and 45. Would you  
17 like to take a break?

18 MS. GJONAJ: You want to  
19 break?

20 MS. McKEEVER: Yeah, let's  
21 take a short break.

22 THE WITNESS: You want to go  
23 two or you want to go another 15 minutes?  
24 Is this a good time to break? It's up to

1           you.   It's your show.   It's my show.

2                       MS. GJONAJ:   Let's take a  
3           break.

4                       THE WITNESS:   Let's take a  
5           break.

6                       THE VIDEOGRAPHER:   Stand by.  
7                       We are off the record at  
8           11:11.

9                       (A recess was taken.)

10                      THE VIDEOGRAPHER:   We are on  
11           the record at 11:29.

12   BY MS. GJONAJ:

13           Q.           Okay.   Dr. McCabe, I'm going to mark  
14           this as Exhibit 8.

15                       (Document marked for  
16           identification as McCabe Exhibit 8.)

17   BY MS. GJONAJ:

18           Q.           Do you recall what Dr. Goodman's  
19           opinion was regarding the association between  
20           benzene and leukemia?

21           A.           Well, again, Dr. Goodman's opinion  
22           concerning that, as she's probably testified to  
23           and as detailed in her reports, which speak to --  
24           for itself, my recollection of her opinion

1 concerning that is that there is an association  
2 between benzene exposure, high dose benzene  
3 exposure -- I think she said 40 to 75 ppm years --  
4 and acute myelogenous leukemia.

5 Q. That was Exhibit 8; right?

6 Okay. On page -- first page of  
7 Exhibit 8, you see it says "Toxicological Profile  
8 of Benzene" and this is -- then it says the "U.S.  
9 Department of Health and Human Services, August  
10 2007"; is that right?

11 A. Correct.

12 Q. And then it says:

13 "Long-term exposure to benzene can  
14 cause cancer of the blood-forming organs. This  
15 condition is called leukemia. Exposure to benzene  
16 has been associated with the development of a  
17 particular type of leukemia called acute myeloid  
18 leukemia (AML)."

19 Did I read that correctly?

20 A. Yes. Let me stop you there, Joe,  
21 just because I think I said that in the previous  
22 answer but -- and the record will speak for  
23 itself, but if I said myelogenous instead of  
24 myeloid, I meant myeloid.

1 Q. Understood.

2 The next page again is the ATSDR  
3 Assessment of Evidence for the Drinking Water at  
4 Camp Lejeune and, again, they're assessing the  
5 water -- drinking water at Camp Lejeune and  
6 whether it caused cancers; correct?

7 Is that your -- is that your  
8 recollection of this document?

9 A. Yes.

10 MS. McKEEVER: Objection to  
11 form.

12 BY MS. GJONAJ:

13 Q. Then on this page they say:

14 "Based on the results of the  
15 meta-analysis, the recent cohort studies, and the  
16 findings that occupational benzene exposure is  
17 associated with reductions in both lymphoid and  
18 myeloid cell types, ATSDR concludes that there is  
19 sufficient evidence for causation for benzene in  
20 all leukemia types, i.e., ALL, CLL, AML, and CML."

21 Did I read that correctly?

22 A. Yes.

23 Q. Next page is the Toxicological  
24 Profiles For Benzene. It says the "Draft For

1 Public Comment October 2024."

2 Have you reviewed this document  
3 before?

4 A. I cannot attest to that. I can tell  
5 you that I have looked at ATSDR tox profiles for  
6 benzene before, but I don't remember if I looked  
7 at the October 2024 one. I just don't recall. I  
8 may have.

9 Q. Okay. And are you aware if there's  
10 a final version of this document?

11 A. I'm not, as I sit here.

12 Q. Okay. And under section 1.2 Summary  
13 of Health Effects, can you read the highlighted  
14 text there?

15 A. "Hematotoxicity, immunotoxicity, and  
16 hematopoietic cancer (acute myelogenous leukemia  
17 or AML) are well-established health effects of  
18 benzene."

19 Q. Do you agree with that statement?

20 MS. McKEEVER: Objection to  
21 form.

22 THE WITNESS: I agree with  
23 this in general. I agree with the  
24 statement that under certain

1           circumstances, benzene is hematotoxic,  
2           hematotoxic, and has been associated with  
3           AML and that that is well-established  
4           science, yes.

5       BY MS. GJONAJ:

6           Q.           Okay.

7           A.           Well-established meaning and I mean  
8       I know about benzene hematotoxicity back to the  
9       time frame that I was in graduate school. So,  
10      yes.

11          Q.           Okay. And then skipping to the  
12      section below that says -- I'm still on page 2,  
13      but the section that says "Hematological." Starts  
14      in bold there. Can you read that section for me?

15          A.           The bold in the word? The bolding  
16      of the word "hematological"? That bullet?

17          Q.           Please. Yeah, that first bullet.

18          A.           Sure. This is basically what I just  
19      alluded to.

20                       "The primary effect of benzene on  
21      the hemato -- hematological system is disruption  
22      of hematopoiesis (the production of blood cells).  
23      The following hematological effects have been  
24      observed in humans and laboratory animals in



1 association with exposure to benzene.

2 "Number (1) decreased numbers of  
3 peripheral blood cells (erythrocytes,  
4 thrombocytes, leukocytes); number (2) decreased  
5 numbers of hematopoietic stem cells and progenitor  
6 cells in hematopoietic tissues (bone marrow,  
7 spleen); (3) decreased cellularity of  
8 hematological tissues (bone marrow, spleen,  
9 thymus); and (4) histological changes due to  
10 hematopoietic tissues (bone marrow, spleen,  
11 thymus)."

12 Q. Thank you.

13 And that next bullet point, could  
14 you please read that as well?

15 A. "So immunological benzene may  
16 disrupt the immune system by decreasing the number  
17 of peripheral lymphocytes through the disruption  
18 of hemopoiesis which contributes to  
19 immunosuppression. Studies conducted in  
20 laboratory animals have shown that exposure to  
21 benzene can alter immune responses to antigens,  
22 function of peripheral lymphocytes, and levels of  
23 circulating antibodies."

24 Q. Thank you.

1                   Do you have any reason to disagree  
2 with any of the statements from the ATSDR that you  
3 just read into the record?

4                   MS. McKEEVER:   Objection to  
5 form.

6                   THE WITNESS:    I don't  
7 disagree with the generalizations that  
8 are being made by -- by the statements  
9 that were made, or that I just read into  
10 the record.

11 BY MS. GJONAJ:

12                 Q.           Okay.

13                 A.           Which another way of saying that --  
14 which another way of saying that is that, yes,  
15 benzene is hemotoxic and immunotoxic under certain  
16 circumstances.

17                 Q.           Okay. Flipping the page, we're on  
18 the National Academy of Sciences document that we  
19 reviewed before in 2003. At this time, I'm  
20 looking at the excerpts on page 320.

21                 A.           Got you. And what --

22                 Q.           And then --

23                 A.           Sorry. What document? This is Gulf  
24 War document again?

1 Q. Yes.

2 A. Did we establish that? Okay.

3 Q. Thank you.

4 And I'm reading from page 320.

5 "The committee concludes from its  
6 assessment of the epidemiologic and experimental  
7 literature that there is sufficient evidence of a  
8 causal relationship between chronic exposure to  
9 benzene and acute leukemia."

10 Did I read that correctly?

11 A. Yes.

12 Q. And then flipping to the -- out of  
13 order but it's page 314.

14 A. Yes.

15 Q. "The committee concludes from its  
16 assessment of the epidemiologic literature that  
17 there is sufficient evidence of an association  
18 between chronic exposure to benzene and adult  
19 leukemia."

20 Did I read that correctly?

21 A. You did.

22 Q. The next page is an excerpt from the  
23 Carcinogenic Effects of Benzene: An Update, which  
24 is dated April 1998. It's a USEPA document;

1 correct?

2 A. Okay. Yes.

3 Q. And I'm reading from page 4.

4 "It has been clearly established and  
5 accepted that exposure to benzene causes acute  
6 nonlymphocytic myelogenous leukemia (ANLL) and a  
7 variety of other blood-related disorders in  
8 humans."

9 Did I read that correctly?

10 I may have mispronounced it but...

11 A. Yes, but you got the parenthetical.

12 Q. Yeah.

13 A. But it's citing ATSDR EPA at the  
14 time.

15 And I guess so, yes, you read it  
16 correctly, and I think my understanding -- my  
17 understanding given that this is document from  
18 1998 that the ANLL is the -- that's a designation  
19 at the time of the same disease processes AML now.

20 Q. That was going to be my next  
21 question.

22 A. Well, there you go.

23 Q. So you would agree that EPA  
24 recognized an association between benzene and this

1 type of leukemia back in 1998 --

2 MS. McKEEVER: Objection.

3 BY MS. GJONAJ:

4 Q. -- right?

5 MS. McKEEVER: Objection to  
6 form.

7 THE WITNESS: Yeah, I agree  
8 that they -- I agree that -- so the  
9 answer to your question is yes, by virtue  
10 of their documents are indicating so as  
11 far back as 1998.

12 BY MS. GJONAJ:

13 Q. Okay. Okay. Now, I'm looking at  
14 the IARC Monograph Volume 100F again from 2012,  
15 and I'm reading from page 285.

16 "There is sufficient evidence in  
17 humans for carcinogenicity of benzene. Benzene  
18 causes acute myeloid leukemia, acute  
19 nonlymphocytic leukemia. Also a positive  
20 association has been observed between exposure to  
21 benzene and acute lymphocytic leukemia, chronic  
22 lymphocytic leukemia, multiple myeloma, and  
23 non-Hodgkin's lymphoma."

24 First, did I read that correctly?

1           A.           Yeah. I just was looking at it. I  
2           thought we already covered this, but yes, you did  
3           read it correctly.

4           Q.           But just confirming, this was not  
5           only specific to non-Hodgkin's lymphoma. They  
6           also reference leukemia in this document; correct?

7           A.           (Reviews documents).

8           Q.           I believe we reviewed this before --

9           A.           Yes.

10          Q.           -- for non-Hodgkin's lymphoma?

11          A.           Yes.

12          Q.           Okay. Now, looking at the IARC  
13          Monograph on Benzene Volume 120, we've looked at  
14          this document before as well; correct?

15          A.           I think so, yes.

16          Q.           All right. And just confirming,  
17          they found they note the positive association has  
18          been observed for non-Hodgkin's lymphoma and CLL;  
19          is that correct?

20                       MS. McKEEVER: Objection to  
21          form.

22                       THE WITNESS: That -- yes, in  
23          sum and -- in sum and substance, yes,  
24          that's what it says.

1 BY MS. GJONAJ:

2 Q. Okay. It says "Positive  
3 associations have been observed for non-Hodgkin's  
4 lymphoma and chronic lymphoid leukemia."

5 Did I read that correctly?

6 A. Yes.

7 Q. Did Dr. Goodman opine that there was  
8 no causal association between TCE and leukemia?

9 MS. McKEEVER: Objection to  
10 form.

11 THE WITNESS: What  
12 Dr. Goodman -- you said Goodman.

13 What Dr. Goodman opined about  
14 in her reports and testimony will speak  
15 for itself.

16 My recollection is that indeed  
17 she did give the opinion that there was  
18 no association between TCE and leukemia.

19 BY MS. GJONAJ:

20 Q. Okay. And now I'm reading from,  
21 again, the ATSDR Assessment of Evidence for the  
22 Drinking Water Contaminants at Camp Lejeune 2017.  
23 It says, reading from page 55:

24 "Based on the epidemiological

1 evidence, the link between TCE-associated immune  
2 disorders and leukemias, including myeloid as well  
3 as lymphoid leukemias, and the evidence that TCE  
4 affects lymphoid cell types, ATSDR concludes that  
5 there is equipoise and above for causation for TCE  
6 and all adult leukemias, including AML, ALL, CML,  
7 and CML."

8 Did I read that correctly?

9 A. I think so, just but for the record,  
10 I don't know if you -- so the last sentence, I  
11 didn't hear you the say the word "evidence." So  
12 we have a clear record. Right.

13 Q. Thank you.

14 In case I didn't read that  
15 correctly, it says:

16 "ATSDR concludes that there is  
17 equipoise and above evidence for causation for TCE  
18 and all adult leukemias, including AML, ALL, CML,  
19 and CLL."

20 A. There you go. Yes.

21 MS. GJONAJ: Thank you. Okay.

22 You can put that aside.

23 (Document marked for  
24 identification as McCabe Exhibit 9.)



1 BY MS. GJONAJ:

2 Q. Okay. Dr. McCabe, I've handed you  
3 what I have marked as Exhibit 9, which is, again,  
4 I'll represent to you are excerpts from different  
5 agency publications.

6 Do you recall whether Dr. Goodman  
7 found a causal association between TCE and bladder  
8 cancer?

9 MS. McKEEVER: Objection to  
10 form.

11 THE WITNESS: So  
12 Dr. Goodman's opinion, as she stated in  
13 her report and she testified, will speak  
14 for itself. My recollection, though, is  
15 you are correct that she gave an opinion  
16 that there was no association between TCE  
17 and bladder cancer.

18 BY MS. GJONAJ:

19 Q. Okay. Reading from the  
20 Toxicological Review of TCE August 2011 from the  
21 EPA:

22 "In addition to the body of evidence  
23 pertaining to between kidney cancer, NHL, and  
24 liver cancer, the available epidemiological

1 studies also provide more limited evidence of an  
2 association between TCE exposures and other types  
3 of cancer, including bladder."

4 And then they go on to state that  
5 there are other cancers.

6 Did I read that correctly?

7 A. Yes, and you're reading from page  
8 4-676.

9 Q. Thank you.

10 And now on to the 2020 EPA Risk  
11 Evaluation on TCE. I'm reading from the bottom of  
12 page 245 of 803.

13 "There is some evidence of  
14 association for bladder and urothelial cancer and  
15 high cumulative TCE exposure, however the  
16 reasonably available studies examine multiple  
17 sites and do not completely account for the  
18 confounders."

19 Did I read that correctly?

20 A. No. You want me to read it? I'll  
21 read it.

22 Q. Okay.

23 A. "There is some evidence of  
24 association for bladder or urothelial cancer and

1 high cumulative TCE exposure, however the  
2 reasonably available studies examined multiple  
3 sites and do not completely account for potential  
4 confounding factors."

5 Q. Okay. I'm turning to the ATSDR  
6 Assessment of Evidence for Drinking Water  
7 Contaminants at Camp Lejeune.

8 Do you recall Dr. Goodman's opinion  
9 on the association between PCE exposure and  
10 bladder cancer?

11 A. As I sit here, no, and, again,  
12 her -- her opinions and the basis of her opinions  
13 as she detailed in her report -- reports and  
14 testimony will speak for themselves.

15 Q. Okay. Do you reference her opinion  
16 in your bladder cancer report?

17 A. I don't believe I did, no. I did  
18 not.

19 Q. Can you read the highlighted text on  
20 page 95?

21 A. "Therefore, ATSDR has decided to  
22 adopt a different position from that currently  
23 held by EPA and IARC and conclude that there is  
24 sufficient evidence for causation for PCE and

1 bladder cancer."

2 Q. Is that consistent with  
3 Dr. Goodman's opinions in the report that you  
4 reviewed?

5 MS. McKEEVER: Objection to  
6 form.

7 THE WITNESS:  
8 (Reviews document.)  
9 I'm sorry. What was your  
10 question?

11 BY MS. GJONAJ:

12 Q. Is that statement consistent with  
13 the opinions in Dr. Goodman's bladder cancer  
14 report?

15 MS. McKEEVER: Same objection.

16 THE WITNESS:  
17 (Reviews document.)  
18 It is not.

19 BY MS. GJONAJ:

20 Q. Okay. Can you to flip a couple of  
21 pages. We're back on the National Academy of  
22 Sciences 2003. I'm reading from page 253.

23 "The committee concludes, from its  
24 assessment of the epidemiologic literature, that

1     there is limited/suggestive evidence of an  
2     association between chronic exposure to  
3     tetrachloroethylene and dry-cleaning solvents and  
4     bladder cancer."

5                     Did I read that correctly?

6             A.        You did, yes.

7             Q.        Now I'm going to flip a couple pages  
8     to the EPA Risk Evaluation on PCE from December of  
9     2020, and I'm looking at page 329 of 714.

10            A.        Got it.

11            Q.        Reading from the top there, it says:  
12                     "There is some evidence for  
13     bladder" --

14            A.        I'm sorry. I'm not with you.  
15     Sorry. What document? What page are we on?

16            Q.        Page 329.

17            A.        And you're saying reading from the  
18     top. Section 6.1 is on the bottom, 6.3.

19            Q.        I think we're on -- I think you're  
20     on a different one.

21            A.        Got you. That's what I'm thinking.  
22     This, I'm on page 329, but I'm probably --

23            Q.        Is there that one? That's the risk  
24     assessment.

1           A.           December 2020? Is that what that  
2 is? Sorry.

3           Q.           December 2020, correct.

4           A.           So flip a page to page 328. 329.  
5 Got it. Thank you.

6           Q.           Okay.

7                       There is some -- I'm reading from  
8 329.

9                       There is some pattern -- strike  
10 that.

11                      Reading from page 329:

12                      "There is some evidence for bladder  
13 cancer and multiple myeloma (MM) but results are  
14 mixed."

15                      Did I read that correctly?

16           A.           You did.

17           Q.           And now I'm turning to the IARC  
18 Monograph Volume 106, and can you read what it  
19 states under "Cancer in humans" on page 329?

20           A.           "There is limited evidence in humans  
21 for the carcinogenicity of tetrachloroethylene.  
22 Positive associations have been observed for  
23 cancer of the bladder."

24                      MS. GJONAJ: Okay. You can

1 put that aside.

2 (Document marked for  
3 identification as McCabe Exhibit 10.)

4 BY MS. GJONAJ:

5 Q. Dr. McCabe, I have now marked as  
6 Exhibit 10 again a compilation of agency  
7 publications and excerpts from those publications,  
8 which I have highlighted and marked as Exhibit 10.

9 Do you recall Dr. Goodman's opinions  
10 on the association between kidney cancer and TCE?

11 A. (Reviews document.)

12 Dr. Goodman's opinions and bases of  
13 her opinions, as she details in her reports, will  
14 speak for themselves.

15 But as I indicated in my report on  
16 page 5 is that, as discussed in Dr. Julie  
17 Goodman's general causation report for kidney  
18 cancer: "Epidemiology evidence does not support a  
19 causal association between TCE and kidney cancer,  
20 except at very high occupational exposures, that  
21 is -- (that is greater than 335 ppm years)."

22 Q. Okay. Looking at Exhibit 10, the  
23 ATSDR Assessment of Evidence for the Drinking  
24 Water Contamination at Camp Lejeune, again 2017,

1 can you read the highlighted Conclusion on  
2 page 22, please?

3 A. "Conclusion: ATSDR concurs with the  
4 evaluations made by IARC, EPA and NTP. Based on  
5 the overall consistent findings of increased risks  
6 of kidney cancer from exposures to TCE and the  
7 supporting mechanistic information, there is  
8 sufficient evidence for causation for TCE and  
9 kidney cancer."

10 Q. And this report was specifically  
11 looking at the water contaminants at Camp Lejeune;  
12 is that correct?

13 MS. McKEEVER: Objection to  
14 form.

15 THE WITNESS: My  
16 understanding is that this report was  
17 specifically looking at water  
18 contaminants believed to be relevant to  
19 Camp Lejeune contamination of the water.

20 BY MS. GJONAJ:

21 Q. I'm not sure I understood that  
22 answer. Can you explain? How was that -- was  
23 -- let me ask that again.

24 So the ATSDR Assessment of Evidence



1 for the Drinking Water at Camp Lejeune and  
2 Specific Cancers, this 2017 report was looking at  
3 the association between the water at Camp Lejeune  
4 and these specific cancers; correct?

5 MS. McKEEVER: Objection to  
6 form.

7 THE WITNESS: So my  
8 understanding is incorrect.

9 They're looking at the  
10 associations -- they're relying on  
11 studies that looked at associations, if  
12 any, between chemicals believed to be or  
13 found to be in the water at Camp Lejeune.

14 They weren't -- they weren't  
15 basing their assessment solely on studies  
16 done at Camp Lejeune.

17 BY MS. GJONAJ:

18 Q. In reaching their conclusions, did  
19 the ATSDR consider the contamination levels in the  
20 water at Camp Lejeune?

21 MS. McKEEVER: Objection to  
22 form.

23 THE WITNESS: And the answer  
24 to that is I think so. I -- but I -- but

1           that's not something that I looked at  
2           in this -- in this case or something.

3       BY MS. GJONAJ:

4           Q.       All right.

5           A.       But I think the answer to that is  
6       yes, I think so.

7           Q.       Okay. And they reviewed the --  
8       strike that.

9                    Are you aware that the ATSDR did  
10       their own water modeling on the water -- in the  
11       water at Camp Lejeune?

12                   Let me ask that a different way.  
13       That was a poor question. Strike that.

14                   You listed the ATSDR water modeling  
15       in your Materials Considered List; is that  
16       correct?

17           A.       I think so. Let me look.

18           Q.       Page 62 of your blood cancer report.

19           A.       (Reviews document.)

20                   That's not what I have on page 62 of  
21       my blood cancer. Are you sure you're looking at  
22       blood cancer and not kidney?

23           Q.       You are correct. It is kidney and  
24       not blood cancer.

1           A.           There you go. All right. You're  
2           trying to trip me up. Page 62 of kidney.

3                       (Reviews document.)

4                       Item number 50 -- items probably 55,  
5           56. Right?

6           Q.           Uh-huh.

7           A.           Yes.

8           Q.           In drafting this report, did the  
9           ATSDR consider items 55 through 58 that you list  
10          in your Materials Considered List?

11                      MS. McKEEVER: Objection to  
12          form.

13                      THE WITNESS: By "this  
14          report" you mean this one? (Indicates).  
15          BY MS. GJONAJ:

16          Q.           Correct. The ATSDR Assessment of  
17          Evidence.

18                      Did they consider the ATSDR water  
19          modeling?

20                      MS. McKEEVER: Objection to  
21          form.

22                      THE WITNESS: It's not  
23          something I looked at in my evaluation of  
24          this case. I suspect they did, yes.

1 BY MS. GJONAJ:

2 Q. You reviewed this document; correct?

3 A. I did.

4 Q. Okay. Do they cite to specific  
5 contamination levels in the water at Camp Lejeune?

6 A. I think they do. It's not something  
7 that was the focus of my work. So honestly  
8 answering your question is I think you're right.  
9 I think it seems reasonable that that's something  
10 they would have done, and I think you're right.

11 Q. Okay. And then on page 22 they say.  
12 "ATSDR concurs with the evaluations  
13 of IARC, EPA and NTP. Based on the overall  
14 consistent findings of increased risks of kidney  
15 cancer from exposures to TCE and the supporting  
16 mechanistic information, there is sufficient  
17 evidence for causation for TCE and kidney cancer."

18 Did I read that correctly?

19 A. Yeah, but I think I already did. So  
20 yes.

21 Q. I know.

22 A. Okay.

23 Q. Okay. If you could please flip to  
24 the EPA Toxicological Review of Trichloroethylene

1 dated 2011 on page 4-676.

2 Okay. I am reading from the second  
3 sentence of that second full paragraph. This --  
4 okay. I'm going to read from the top.

5 "Following EPA (2005b) 'Guidelines  
6 for Carcinogen Risk Assessment,' TCE is  
7 characterized as 'carcinogenic to humans' by all  
8 routes of exposure. This conclusion is based on  
9 convincing evidence of a causal association  
10 between TCE exposure in humans and kidney cancer."

11 Did I read that correctly?

12 A. Yes.

13 Q. Okay. They don't make any reference  
14 to specific levels here; correct?

15 MS. McKEEVER: Objection to  
16 form.

17 THE WITNESS: They don't make  
18 any reference to --

19 BY MS. GJONAJ:

20 Q. All right. They don't -- they don't  
21 make any reference to TCE exposure levels in this  
22 paragraph, do they?

23 MS. McKEEVER: Objection to  
24 form.

1 THE WITNESS: You are  
2 correct.

3 BY MS. GJONAJ:

4 Q. We've looked at this a few times  
5 already, but the Risk Evaluation on TCE 2011, page  
6 252 of 80 -- of 803.

7 A. Let me get there because you're  
8 skipping over. Right?

9 Q. It should be the next page.

10 A. Okay. Sorry. Let's see.  
11 The National Academy of Sciences  
12 document?

13 Q. Nope. The EPA Risk Evaluation for  
14 TCE.

15 A. August of 2011?

16 Q. November 2020.

17 A. Got it.

18 Q. All right. And we've gone through  
19 this paragraph already but again -- strike that.

20 Did the -- strike that.

21 Did the EPA and the Risk Evaluation  
22 of TCE find there to be a positive association  
23 between kidney cancer and exposure to TCE?

24 MS. McKEEVER: Objection to

1 form.

2 THE WITNESS:

3 (Reviews document.)

4 Let me hear the question  
5 again. Please.

6 BY MS. GJONAJ:

7 Q. Did the EPA indicate positive  
8 associations between kidney cancer and exposure to  
9 TCE in this document?

10 A. (Reviews document.)

11 Well, again, this -- this was not  
12 the focus of the work I did in this case. So I'm  
13 reacting to the question that you're asking me  
14 based on the document that you put in front of me.

15 It seems that the language in the  
16 highlighted paragraph at the top of page 252 of  
17 803 in this document -- this document being the  
18 Risk Evaluation for Trichloroethylene November  
19 2022 -- indicates that a positive association  
20 between kidney cancer and exposure to TCE is being  
21 concluded.

22 Q. Okay. If you skip to the next page,  
23 I'm looking at the IARC Monograph Volume 106, page  
24 189, and it says.

1                    "There is -- there is sufficient  
2 evidence in humans for the carcinogenicity of  
3 trichloroethylene. Trichloroethylene causes  
4 cancer of the kidney."

5                    Did I read that correctly?

6            A.            You did.

7            Q.            Okay. You can put that aside.

8                    Are you aware of any instance where  
9 Dr. Goodman has opined that any chemical  
10 definitively caused a disease?

11                   MS. McKEEVER: Objection to  
12 form.

13                   THE WITNESS: No, as I sit  
14 here, I don't -- I don't know that. I  
15 don't know one way or the other.

16                   MS. GJONAJ: Okay.

17                   Okay. I am marking as  
18 Exhibit 11.

19                   (Document marked for  
20 identification as McCabe Exhibit 11.)

21 BY MS. GJONAJ:

22            Q.            Have you seen this document before?

23            A.            (Reviews document.)

24                    Well, first, it's not a complete



1 document, but I have not -- I don't think --  
2 this -- this is not a document that is familiar to  
3 me.

4 Q. You see that it's a December 2020  
5 Statement from the International Network for  
6 Epidemiology and Policy on the conflict of  
7 interest in EPI studies; is that correct?

8 A. That's what it says, yes.

9 Q. Okay. And if you turn to pages 6  
10 and 7, you'll see the list of authors and  
11 coauthors; is that right?

12 A. Yes.

13 Q. Okay. Some of them are formerly  
14 from the EPA I see looking at Jane C. Caldwell; is  
15 that right?

16 MS. McKEEVER: Objection to  
17 form.

18 THE WITNESS: I don't know  
19 that she's formerly of the EPA --

20 BY MS. GJONAJ:

21 Q. Okay.

22 A. -- but she's --

23 Q. It says Jane C. Caldwell. Okay.

24 A. -- from the EPA.

1 Q. Okay. It says Jane C. Caldwell,  
2 U.S. Environmental Protection Agency, retired,  
3 from Durham, North Carolina?

4 A. I see that.

5 Q. Okay. And there are several other  
6 authors listed as well; correct?

7 A. There are --

8 Q. Okay.

9 A. There are eight -- there are eight  
10 coauthors and a lead author, yes.

11 Q. Thank you.

12 And then on page 7, they list many  
13 of the member organizations of the INEP; is that  
14 correct?

15 A. I'm sorry. You're asking me what --  
16 what's listed here? What are you asking me is  
17 listed here?

18 Q. So if you're looking at the bullet  
19 points there?

20 A. Yep.

21 Q. Would you agree that reading right  
22 above, actually, it says:

23 "INEP currently includes twenty-four  
24 member associations across five continents"?

1 A. Got it. Okay. Yes.

2 Q. Okay. And those include the  
3 American College of Epidemiology and the  
4 International Society for Environmental  
5 Epidemiology.

6 Do you see that?

7 A. Yeah, those two amongst probably  
8 looks like a dozen or more listed here on this.  
9 Well, actually, it says right there --

10 Q. Right. 24?

11 A. -- 24. Yeah.

12 Q. And if you flip the page, you'll see  
13 page 21 excerpted there?

14 A. 21. Okay.

15 Q. And under the section titled "Recent  
16 Epidemiology-specific Examples of COI."

17 Do you see that?

18 A. I do.

19 Q. Okay. If you look at the first  
20 example of conflict of interest they have there,  
21 it discusses an exposé by the Center of Public  
22 Integrity.

23 Do you see that?

24 A. Under section A. Right?

1 Q. Under section A?

2 A. Yeah. Yes.

3 Q. Can you please read a few sentences  
4 starting with "The exposé includes." It's about  
5 three lines down there.

6 A. "The exposé included a video link."  
7 That sentence?

8 Q. Yep. The next three sentences.

9 A. Got it.

10 Q. Please.

11 A. "The exposé included a video link to  
12 Dr. Julie Goodman giving expert testimony that  
13 cited junk science. As a member of the American  
14 College of Epidemiology (ACE) Board, she attempted  
15 to obstruct the ACE endorsement of the 2012  
16 IJPC-SE Position Statement on Asbestos. CPI  
17 exposed Dr. Goodman's COI as financially  
18 benefiting from vested interests; her employer  
19 (Gradient) had been associated with a number of  
20 scientists employed to manufacture doubt and  
21 foment uncertainty about scientific evidence."

22 Keep going?

23 Q. Yep. Were you aware that this group  
24 of epidemiologists publicly accused her of

1 promoting junk science?

2 MS. McKEEVER: Objection to  
3 form and foundation.

4 THE WITNESS: I don't know.

5 MS. GJONAJ: I asked -- I  
6 asked if he was aware.

7 MS. McKEEVER: Go ahead.

8 THE WITNESS: No. No.

9 BY MS. GJONAJ:

10 Q. (Laugh).

11 A. (Laugh).

12 Q. Do you consider Dr. Goodman's  
13 opinions more reliable than those of the EPA?

14 MS. McKEEVER: Objection to  
15 form.

16 THE WITNESS: I did not -- I  
17 did not assess the opinions of any of the  
18 experts in this case on either side,  
19 plaintiff or defense or DOJ, in terms of  
20 the strengths of their opinions relative  
21 to what EPA and other regulatory agencies  
22 have said about these topics.

23 BY MS. GJONAJ:

24 Q. Okay. So you don't have an opinion

1 one way or the other?

2 A. I do --

3 MS. McKEEVER: Objection to  
4 form.

5 THE WITNESS: I don't.

6 BY MS. GJONAJ:

7 Q. Okay. Did -- if --

8 A. Well, let me back up.

9 I don't have an opinion because it's  
10 not something that I evaluated. So of course I  
11 don't have an opinion on something I haven't  
12 evaluated.

13 Q. Have you evaluated the opinions of  
14 the 2020 or of the EPA 2020 Risk Assessment on  
15 TCE?

16 MS. McKEEVER: Objection to  
17 form.

18 THE WITNESS: Generally  
19 speaking, no. But which opinions are you  
20 talking about? But, I mean, I guess the  
21 answer to that is no, that's not  
22 something that I undertook in my work on  
23 this case, and I didn't state anything to  
24 that effect in any of my reports that

1           that was part of what I was doing.

2                       So I guess the answer -- the  
3           answer to your question as I understand  
4           it is no, but I don't -- also I don't  
5           know what opinions you're talking about.

6   BY MS. GJONAJ:

7           Q.           Okay. Did you consider any opinions  
8           from the 2020 EPA Risk Assessment for TCE in  
9           forming your opinions in this case?

10                      MS. McKEEVER: Objection to  
11           form.

12                      THE WITNESS: Nothing that I  
13           can think of, as I sit here, that would  
14           be relevant. So the answer is no.

15   BY MS. GJONAJ:

16           Q.           Okay. Do you consider Dr. Goodman's  
17           opinions to be more reliable than those of IARC?

18                      MS. McKEEVER: Objection to  
19           form.

20                      THE WITNESS: I don't have  
21           any opinion about that.

22   BY MS. GJONAJ:

23           Q.           Okay. Do you consider Dr. Goodman's  
24           opinions to be more reliable than those of the

1 ATSDR?

2 MS. McKEEVER: Objection to  
3 form.

4 THE WITNESS: I also don't  
5 have any opinion about that.

6 BY MS. GJONAJ:

7 Q. Okay. Is it your opinion that  
8 industry -- is it your -- strike that.

9 Is it your opinion that industry  
10 consultants views should override the consensus of  
11 federal and international public health interest  
12 agencies?

13 MS. McKEEVER: Objection to  
14 form.

15 THE WITNESS: I don't have  
16 any opinion about that. I don't have  
17 context. I just -- I just -- this is not  
18 something that I looked into or addressed  
19 and so, therefore, I don't -- I can't  
20 give you an answer.

21 Well, I certainly can't give  
22 you an answer that I have an expert  
23 opinion concerning that issue.

24 BY MS. GJONAJ:



1 Q. Did you review the general causation  
2 opinion of Dr. Howard Hu that was submitted by  
3 Plaintiffs Leadership in this litigation?

4 A. I don't know Hu's -- I  
5 guess -- yeah, I guess -- I reviewed as I  
6 indicated in my reports -- in my reports that I  
7 reviewed Dr. Hu's report on NHL. I guess I  
8 only -- well, I guess I listed it on all my  
9 reports. Let me back up.

10 I reviewed Dr. Hu's report on NHL --

11 Q. Okay.

12 A. -- as I indicated in my report.

13 Q. And you've cited to studies done by  
14 Dr. Howard Hu in literature that you have  
15 published; correct?

16 MS. McKEEVER: Objection to  
17 form.

18 THE WITNESS: If there's a  
19 specific example of that you would like  
20 to call to my attention, I'd be happy to  
21 look at it.

22 It seems reasonable that I  
23 would have done that given my past  
24 interactions and knowledge of Dr. Hu's

1 work concerning bone lead.

2 BY MS. GJONAJ:

3 Q. Okay.

4 A. So, you know, as I sit here, I  
5 don't -- I don't remember that, but I'm not  
6 denying that I did that. I seemingly -- seems  
7 like that's reasonable that I would have done  
8 that.

9 Q. And did you consider his review of  
10 the epidemiological studies in this case before  
11 forming your opinions?

12 MS. McKEEVER: Objection to  
13 form.

14 THE WITNESS: I did not.

15 Other than in the way that I  
16 said in my report in the -- in the  
17 paragraph that precedes the statement  
18 where I said my "jumping in" or "jumping  
19 off." Whatever I said, I jumped.

20 (Laugh). That. Other than that, no.

21 BY MS. GJONAJ:

22 Q. Okay. All right. You can put that  
23 exhibit aside.

24 Do you agree that TCE is metabolized

1 in the body through two distinct pathways?

2 A. Generally, yes, that's true.

3 Q. Okay. And one of those is the  
4 oxidative pathway primarily via CYP2E1. I may be  
5 pronouncing that wrong.

6 A. You got it. So it's CYP. C-Y-P2  
7 capital E1.

8 The answer to that question is yes,  
9 cytochrome CYP2E1 is the primary P4 enzyme -- P450  
10 enzyme involved in the oxidative metabolism of  
11 TCE.

12 Q. And that produces metabolites like  
13 TCA, DCA, chlorohydrate, and trichloroethanol; is  
14 that correct?

15 A. Yes, that's correct.

16 Q. And the second pathway is the  
17 glutathione conjugation where TCE is first  
18 conjugated with the glutathione in the liver; is  
19 that correct?

20 A. Correct, for the most part in the  
21 liver. Other tissues, but predominantly in the  
22 liver.

23 Q. Okay. And it forms DCVG; is that  
24 correct?

1 A. Correct.

2 Q. Then it further metabolized in the  
3 kidneys to form DCVC; is that right?

4 MS. McKEEVER: Objection to  
5 form.

6 THE WITNESS: I think it's  
7 metabolized both in the liver and the  
8 kidney, but then active in the kidney.

9 BY MS. GJONAJ:

10 Q. Okay. Is DCVC a metabolite known to  
11 be toxic to kidney cells?

12 MS. McKEEVER: Objection to  
13 form.

14 THE WITNESS: Under certain  
15 circumstances, yes.

16 BY MS. GJONAJ:

17 Q. Okay. Is DCVC a metabolite known to  
18 be toxic to hematopoietic systems?

19 MS. McKEEVER: Objection to  
20 form.

21 THE WITNESS: (Pause). I  
22 don't think so. You know, I don't -- I  
23 can't recall if there's any studies that  
24 would have looked at it in vitro or

1 something like that, but otherwise, no, I  
2 don't think that DCVC -- did you say  
3 toxic? Genotoxic? What did you ask me?  
4 Sorry. Let me hear the question again so  
5 I'm not.

6 BY MS. GJONAJ:

7 Q. The question was: Is DCVC known to  
8 be toxic to the hematopoietic system?

9 MS. McKEEVER: Same objection.

10 THE WITNESS: That's not my  
11 understanding that it is.

12 BY MS. GJONAJ:

13 Q. Can you turn to page -- I'm in the  
14 kidney report.

15 A. Okay.

16 Q. Three lines from the bottom.

17 MS. McKEEVER: Sorry. What  
18 page?

19 THE WITNESS: Page?

20 MS. GJONAJ: Page 19. I'm  
21 sorry.

22 BY MS. GJONAJ:

23 Q. You state that:  
24 "DCVC metabolite is associated with

1 toxicity for the kidney reproductive systems,  
2 hematopoietic system, and possibly others."

3 Did I read that correctly?

4 A. You did.

5 Q. Do you disagree with that statement?

6 A. (Reviews document.)

7 Q. Strike that.

8 Is that still your opinion, sitting  
9 here today?

10 A. Well, I'm not expressing it as an  
11 opinion in my report. Right? I'm capturing, I'm  
12 recounting, or I'm stating in that paragraph it is  
13 related to what's in Figure 1 of my report, which  
14 comes from a Larry Lash, Dr. Lash 2025 study  
15 where, you know, starts with my original thought  
16 which was that DCVC is known to be toxic. That's  
17 right. So toxic to the kidney but also  
18 hematopoietic system.

19 So I'd have to go back and review  
20 the Lash study and possibly others to be able to  
21 give you context about DCVC in the hematopoietic  
22 system and toxicity in the hematopoietic system.

23 Q. Have you cited to any papers in your  
24 report that state that DCVC is not associated with

1 toxicity for the hematopoietic system?

2 A. (Reviews document.)

3 Not that I recall.

4 And also, the context here is that  
5 this is a report on kidney cancer where in a  
6 section under Mechanisms of VOC Toxicity  
7 concerning a mechanism of DCVC metabolite being  
8 associated with toxicity to the kidney.

9 So I can't think of nor did I -- nor  
10 did I indicate, nor did I see anyone else  
11 indicate, as -- as I sit here, that DCVC  
12 metabolite toxicity to the hematopoietic system  
13 was relevant in any way to a mechanism of kidney  
14 cancer causation.

15 Q. I'm going to strike that as  
16 nonresponsive. I don't think that you answered my  
17 question.

18 My question was: Have you cited to  
19 any studies that state that DCVC metabolite is not  
20 associated with toxicity for the hematopoietic  
21 system?

22 MS. McKEEVER: Objection to  
23 form.

24 THE WITNESS: I don't think I

1           made any statements to that effect that I  
2           recall in my blood -- in the kidney  
3           cancer report that we're talking about  
4           here.

5       BY MS. GJONAJ:

6           Q.           Okay. How about in your blood  
7           cancer report? Did you make any statements in  
8           your blood cancer report that are inconsistent  
9           with the statement in your kidney cancer report?

10                       MS. McKEEVER: Objection to  
11           form.

12                       THE WITNESS:  
13                       (Reviews document.)

14       BY MS. GJONAJ:

15           Q.           I'm going to strike that question.  
16                       Is there any reason you would have  
17           made this statement in your kidney cancer report  
18           if it were not accurate?

19                       MS. McKEEVER: Objection to  
20           form.

21                       THE WITNESS: No, and it is  
22           accurate by virtue that I have a citation  
23           for it coming from a figure coming from  
24           at least one article from 2025 that I



1           cited in my report.

2       BY MS. GJONAJ:

3           Q.       Okay. So that figure states that  
4       DCVC metabolite is associated with toxicity for  
5       the hematopoietic system?

6                       MS. McKEEVER: Objection to  
7       form.

8       BY MS. GJONAJ:

9           Q.       Is that correct?

10          A.       It does.

11          Q.       Okay. So is TCA an oxidative  
12       metabolite?

13          A.       Yes.

14          Q.       Okay. Is DCVC an oxidative  
15       metabolite?

16          A.       Yes and no.

17          Q.       Is it accurate to say it could be an  
18       oxidative metabolite?

19          A.       Well, you need --

20                       MS. McKEEVER: Objection to  
21       form.

22                       THE WITNESS: You need to  
23       have the oxidative metabolite of TCE to  
24       produce the precursor that then through a

1           Phase 2 reaction, glutathione  
2           conjugation, right, would become DCVG  
3           followed by DCVC.

4       BY MS. GJONAJ:

5           Q.           Okay. And oxidative metabolites of  
6       TCE can produce oxidative stress; correct?

7                       MS. McKEEVER: Objection to  
8       form.

9                       THE WITNESS: Under -- under  
10      certain circumstances, yes.

11     BY MS. GJONAJ:

12           Q.           Okay. Dr. Gilbert references the  
13      concept of immune surveillance in her report.

14                       Did you see -- read that?

15           A.           Yes.

16           Q.           Okay. And is immune surveillance an  
17      idea that the immune system identifies and  
18      eliminates emerging tumor cells?

19           A.           Generally, yes.

20           Q.           Okay. And you agree that it's a  
21      well-established principle in cancer biology?

22                       MS. McKEEVER: Objection to  
23      form.

24                       THE WITNESS: Well --

1           well-established principle. Yes, in  
2           cancer -- in cancer immunobiology, yes.

3 BY MS. GJONAJ:

4           Q.           Okay. And Dr. Gilbert also notes  
5           that the loss of immune surveillance can allow  
6           cancer cells to grow unchecked.

7                       Did you read that in her report?

8           A.           Sure.

9           Q.           Okay.

10          A.           I mean, that's something that, yes,  
11          I read that many places --

12          Q.           Okay.

13          A.           -- and I know that from other  
14          places --

15          Q.           Right.

16          A.           -- including Dr. Gilbert's reports.

17          Q.           Okay. Correct.

18                       And I believe you cite to that in  
19          your report as well; correct? All right.

20          A.           I do.

21          Q.           And do you agree that immune  
22          suppression increases cancer risk?

23                       MS. McKEEVER: Objection to  
24          form.

1 THE WITNESS: Under certain  
2 circumstances, yes.

3 BY MS. GJONAJ:

4 Q. So in some circumstances, immune  
5 suppression can increase cancer risk?

6 MS. McKEEVER: Objection to  
7 form.

8 THE WITNESS: Yes. It's just  
9 not -- it's just not -- it's not -- it's  
10 not a generalization that can be made,  
11 but yes, the loss of immune surveillance  
12 and immunosuppressive mechanisms can  
13 contribute to, can be protumorigenic but  
14 also could be antitumorigenic. Could  
15 lead to progression of a kidney -- of a  
16 cancer as well as under different  
17 circumstances lead to regression of a  
18 tumor.

19 BY MS. GJONAJ:

20 Q. Okay. We'll get to that.  
21 Turning to your blood cancer report  
22 on page 31.

23 A. Yes.

24 Q. You state under section -- under the

1 section on Human Studies:

2 "Federal and international agencies  
3 have concluded that the immune system is a  
4 potential target of TCE toxicity."

5 Did I read that correctly?

6 A. You did.

7 Q. And you put "potential" in italics;  
8 is that right?

9 A. Is that italics and bold or looks  
10 like it's both. Yes.

11 Q. Okay. Why did you frame this as  
12 potential rather than acknowledging that agencies  
13 like the EPA have definitively concluded that TCE  
14 is immunotoxic?

15 MS. McKEEVER: Objection to  
16 form.

17 THE WITNESS:

18 (Reviews document.)

19 Well, my recollection is --  
20 well, first of all, this morning and into  
21 this afternoon now, I don't think any of  
22 the -- or don't remember any of the  
23 federal or international agency documents  
24 that you've put in front of me and asked

1 me about dealt with the immune system.  
2 That's one.

3 Two is that I believe some of  
4 those -- and I'm thinking of the EPA  
5 perhaps -- actually says that the immune  
6 system is a potential target for TCE  
7 toxicity.

8 Yeah. So I think in the  
9 context of the sentence, I think what I'm  
10 saying is that -- federal because that's  
11 what the federal and international  
12 agencies or certain federal and  
13 international agencies have concluded,  
14 that the immune system is a potential  
15 target --

16 BY MS. GJONAJ:

17 Q. Okay.

18 A. -- of TCE toxicity.

19 MS. GJONAJ: I'm going to mark  
20 as Exhibit 12. In an effort to save  
21 paper, I excerpted this one as well.

22 (Document marked for  
23 identification as McCabe Exhibit 12.)

24 BY MS. GJONAJ:

1           Q.           This, again, are excerpts from the  
2   EPA 2020 Risk Assessment on TCE, and if you look  
3   at I believe it's page 246, the last -- the last  
4   paragraph on page 246. It says:

5                        "Both animal and human studies  
6   demonstrate that TCE exposure can result in either  
7   autoimmune/immune enhancement responses or  
8   immunosuppression."

9                        Did I read that correctly?

10          A.           You did.

11          Q.           Okay. And then skipping to page  
12   247, the second line, it says:

13                       "Overall, immunotoxicity in the form  
14   of both autoimmunity and immunosuppression  
15   following TCE exposure are supported by the weight  
16   of the evidence."

17                       Did I read that correctly?

18          A.           You did.

19          Q.           Do you disagree with that  
20   conclusion?

21                       MS. McKEEVER: Objection to  
22   form.

23                       THE WITNESS:

24                       (Reviews document.)

1 I don't disagree with the  
2 conclusion in the context by which the  
3 EPA is making that determination, or at  
4 least in the understanding of or my  
5 understanding of the EPA making that  
6 determination.

7 BY MS. GJONAJ:

8 Q. What is your understanding?

9 MS. McKEEVER: Objection to  
10 form.

11 THE WITNESS: My  
12 understanding is that the EPA is  
13 evaluating chemicals for the purposes of  
14 establishing for risk assessment and  
15 regulatory policy.

16 BY MS. GJONAJ:

17 Q. Okay. The EPA's 2020 Risk  
18 Assessment went through peer review by federal and  
19 nonfederal scientists; correct?

20 MS. McKEEVER: Objection to  
21 form.

22 THE WITNESS: I don't recall.  
23 It seems -- seems that's commonly done.  
24 So yes, I think that's probably true.



1           Possibly true.

2       BY MS. GJONAJ:

3           Q.       You're not --

4           A.       Possibly true --

5           Q.       Okay.

6           A.       -- I guess is a better answer.

7           Q.       Are you aware of any agency risk  
8       assessment that reversed the conclusions of the  
9       EPA?

10                               MS. McKEEVER:   Objection to  
11       form.

12       BY MS. GJONAJ:

13           Q.       In this document.

14           A.       I don't -- yeah, I don't -- I don't  
15       know that I --

16           Q.       Okay.

17           A.       Well, actually, I don't know that I  
18       understand what you're asking me.

19           Q.       Since November 2020, have any --  
20       strike that.

21                               Since 2020, has any regulatory  
22       agency stated that TCE is not immunotoxic?

23                               MS. McKEEVER:   Objection to  
24       form.

1 THE WITNESS: I don't know.

2 BY MS. GJONAJ:

3 Q. I see that you reference the EPA  
4 Risk Evaluation on TCE on -- I believe it's -- let  
5 me check -- page 50 of your blood cancer report.

6 A. (Reviews document.)

7 Q. Did you reference the EPA's Risk  
8 Evaluation on TCE anywhere else in your report?

9 MS. McKEEVER: Objection to  
10 form.

11 THE WITNESS: I probably  
12 listed it for one and two. Not that I  
13 recall.

14 BY MS. GJONAJ:

15 Q. Okay. Did you consider the findings  
16 of the 2020 EPA risk assessment when reaching your  
17 opinions in this case?

18 A. Yes, in the context of what I'm  
19 saying in -- on page 50 in Footnote 50 feet -- 55,  
20 I believe a similar footnote appears in the other  
21 two reports as well.

22 Q. In the footnote you're referencing  
23 you say where it states:

24 "Dr. Gilberts cite to the USEPA Risk

1 Evaluation of Trichloroethylene (2020), wherein it  
2 states that 'overall, immunotoxicity in the form  
3 of both autoimmunity and immunosuppression  
4 following TCE exposure are supported by the weight  
5 of evidence.'"

6 That's a quote.

7 A. From Gilbert NHL leukemia --

8 Q. Correct.

9 A. -- report, page 2 of 29.

10 Q. And then you go on -- yes, that was  
11 a quote from Dr. Gilbert's blood cancer report on  
12 page 29.

13 Then you go on to say:

14 "However, this document did not  
15 conclude that the weight of the evidence linked  
16 these mechanisms causatively to lymphoma or  
17 leukemia."

18 Did I read that correctly?

19 A. Yes.

20 Q. Are you aware that Dr. Gilbert was  
21 invited to review the EPA's 2020 Risk Evaluation  
22 on TCE?

23 A. It sounds like something that she --  
24 that you already asked me and something that she

1 indicated in her report. So from that  
2 perspective, I'm aware of it.

3 MS. GJONAJ: Okay.

4 (Document marked for  
5 identification as McCabe Exhibit 13.)

6 BY MS. GJONAJ:

7 Q. I have marked as Exhibit 13 the 2020  
8 publication by Germolec and colleagues titled  
9 "Consensus on the Key Characteristics of  
10 Immunotoxic Agents as a Basis for Hazard  
11 Identification."

12 You see that?

13 A. I do.

14 Q. Okay. This document does not appear  
15 on your Materials Considered List; is that  
16 correct?

17 A. It does not.

18 Q. Okay. And it seems that this is a  
19 consortium of international scientists that have  
20 reviewed and reached a consensus regarding the key  
21 characteristics of agents that should be labeled  
22 immunotoxic.

23 Would you agree with that?

24 MS. McKEEVER: Objection to

1 form and foundation.

2 THE WITNESS: I haven't  
3 reviewed the document. I'm reacting to  
4 what you've put in front of me and what I  
5 see as the title of a paper published in  
6 "Environmental Health Perspectives" by a  
7 group of immunotoxicologists. Many of  
8 whom I know very well.

9 BY MS. GJONAJ:

10 Q. Okay. And if you flip through,  
11 you'll see that there is a section discussing each  
12 of the 10 characteristics.

13 See on that third page it starts  
14 with KC1. You see that?

15 A. (Reviews document.)

16 Got it. So KC1 is a key  
17 characteristic. Got it. Yes.

18 Q. Okay. And turning to page -- what I  
19 believe is page 6, you'll see KC5?

20 A. (Reviews document.)

21 KC5 on page 6, yes.

22 Q. And the Key Characteristic 5 is  
23 labeled as "Modifies Cellular Differentiation."

24 Do you agree with that?

1           A.           I agree that modification of  
2           cellular differentiation would be a key  
3           characteristic to consider in labeling a  
4           particular compound or chemical to be immunotoxic.

5           Q.           Okay. Is cellular differentiation a  
6           fundamental part of how the immune system  
7           maintains and activates different immune cells?

8                       MS. McKEEVER: Objection to  
9           form.

10                      THE WITNESS: Let me -- let  
11           me hear you. Let me hear that again,  
12           please.

13           BY MS. GJONAJ:

14           Q.           So the key characteristic is  
15           "Modifies Cellular Differentiation"?

16           A.           That part -- that part I  
17           understood --

18           Q.           Okay. And then --

19           A.           -- but I wanted to hear your  
20           question.

21           Q.           Okay. And is cellular  
22           differentiation is a fundamental part -- would --  
23           strike that.

24                       Would you say that cellular

1 differentiation is a fundamental part of how the  
2 immune system maintains and activates different  
3 immune cells?

4 MS. McKEEVER: Objection.

5 Same objection.

6 THE WITNESS: Yeah, I can  
7 go -- I guess I can go along with that,  
8 yes.

9 BY MS. GJONAJ:

10 Q. Okay.

11 A. So cellular differentiation -- let  
12 me say it back to you in a way that is more  
13 palatable to me scientifically, which is that  
14 cellular differentiation of different lymphocyte  
15 and myocyte -- myocyte cells.

16 Cellular differentiation of lymphoid  
17 myeloid cells is important in establishing,  
18 developing, generating an immune response as well  
19 as its control.

20 Q. Okay. Can you skip to the last five  
21 lines of that section. You'll see a sentence that  
22 says "Although molecular targets."

23 A. Sorry. I was -- where do you want  
24 me to go to? Where do you want me?

1 Q. We're still on Key Characteristic 5.

2 A. Okay.

3 Q. And then just above -- just above  
4 Key Characteristic 6, you'll see a sentence five  
5 lines up that says "Although molecular targets"?

6 A. Yes.

7 Q. Okay. And it says -- can you read  
8 that sentence for me, please?

9 A. Sure.

10 "Although molecular targets and  
11 mechanisms likely vary, emerging evidence from AhR  
12 ligands" -- so capital H -- sorry. Capital A  
13 small H capital R.

14 Let me start over.

15 "Although molecular targets and  
16 mechanisms likely vary, emerging evidence from AhR  
17 ligands, as well as pollutants such as  
18 trichloroethylene and mercury, indicates that some  
19 exposures can modify epigenetic regulatory  
20 mechanisms in immune systems -- in immune cells,  
21 which can also skew differentiation."

22 Q. Okay. So are they -- are they  
23 citing TCE -- based on your reading -- strike  
24 that.



1                   Based on your reading of this, are  
2                   they citing TCE as an example of a chemical that  
3                   meets the Key Characteristic Number 5?

4                   MS. McKEEVER:   Objection to  
5                   form and foundation.

6                   THE WITNESS:   Yes, they are  
7                   citing or -- well, I think it speaks for  
8                   itself, but I think they are -- they are  
9                   citing and they are calling into play,  
10                  into awareness studies that under certain  
11                  circumstances TCE can modify cellular  
12                  differentiation under certain  
13                  experimental contrivances.

14                  TCE can modify immune cells in  
15                  a manner that demonstrates -- through  
16                  experimental studies demonstrates  
17                  modifications of cellular  
18                  differentiation.

19                  BY MS. GJONAJ:

20                  Q.            Okay.   And turning to the next page,  
21                  I am now looking at Key Characteristic 7 --

22                  A.            Okay.

23                  Q.            -- on page 7, and it says "Alters  
24                  Effector Function of Specific Cell Types."

1 Do you see that?

2 A. I do.

3 Q. Okay. And then scrolling, going  
4 down to the last line in that same column, it  
5 starts with "Environmental agents."

6 It says:

7 "Environmental agents have also been  
8 associated with alterations in helper T-cell  
9 functions including" and then it goes on to say  
10 "volatile organics, such as trichloroethylene."

11 Do you see that?

12 A. Just orient me to the paragraph  
13 again. Which paragraph under 7?

14 Q. The end.

15 A. 1, 2, 3.

16 Q. The very last line on the first  
17 column. It starts with "Environmental agents have  
18 also been associated."

19 The very bottom line on that page.

20 A. Got it.

21 Q. Okay.

22 A. (Reviews document.)

23 Q. They appear to be citing to TCE as  
24 an example of a volatile organic compound that

1 meets the key characteristic listed in KC7; is  
2 that correct?

3 A. Yes.

4 MS. McKEEVER: Objection to  
5 form and foundation.

6 MS. GJONAJ: What time -- what  
7 time do you want to take lunch?

8 MS. McKEEVER: Are you ready  
9 for lunch?

10 THE WITNESS: You want to go  
11 another -- you want to go another 15  
12 minutes or so? Go to 1:15. Unless this  
13 is natural breakpoint.

14 MS. GJONAJ: This is probably  
15 a natural breakpoint.

16 THE WITNESS: I can -- okay.  
17 Let's do it.

18 THE VIDEOGRAPHER: Stand by.  
19 We are off the record at  
20 12:52.

21 (Whereupon, at 12:52 p.m., a  
22 luncheon recess was taken.)  
23  
24

AFTERNOON SESSION

(2:04 PM)

MICHAEL J. McCABE, JR., PHD

called for continued examination and, having been previously duly sworn, was examined and testified further as follows:

EXAMINATION (CONTINUED).

THE VIDEOGRAPHER: We are on the record at 14:04.

MS. GJONAJ: Dr. McCabe, hand this to you.

I have marked as Exhibit 14 the proposed rule relegating TCE published at 88 Fed Reg 74712 on October 31, 2003.

(Document marked for identification as McCabe Exhibit 14.)

BY MS. GJONAJ:

Q. Have you seen that document before?

A. Yeah. Just correction for the record, though, 2023.

Q. Was that not what I said? Okay.

Thank you.

And this document includes the EPA's

1 rationale and calculations for setting a proposed  
2 ECEL for occupational exposures to TCE; correct?

3 MS. McKEEVER: Objection to  
4 form.

5 THE WITNESS:

6 (Reviews document.)

7 I'm not sure what this  
8 document is that you've put in front of  
9 me. So let me hear your question again,  
10 please.

11 BY MS. GJONAJ:

12 Q. You said you reviewed this document  
13 before; correct?

14 A. As I sit here right now, I'm not  
15 sure if I did or didn't.

16 Q. Okay. Are you aware that the EPA  
17 relied on the 2020 risk evaluation to determine  
18 the exposure limits it proposed for occupational  
19 exposure to TCE?

20 MS. McKEEVER: Objection to  
21 form.

22 THE WITNESS: I'm not.

23 That's not something that I -- that's not  
24 something I undertook in the work that I

1           did on this case.

2       BY MS. GJONAJ:

3           Q.           Okay. Do you know what endpoint the  
4       EPA determined to be the most sensitive in adults  
5       for proposing -- for the purposes of deriving the  
6       ECEL on TCE?

7                       MS. McKEEVER: Objection to  
8       form.

9                       THE WITNESS: No. Again,  
10       that's not something that I evaluated or  
11       considered in the conduct of the work  
12       that I did on this case.

13       BY MS. GJONAJ:

14           Q.           Okay. Can you please turn to page  
15       74731.

16           A.           (Reviews document.)

17           Q.           Do you see heading B where it says  
18       "ECEL Value of .0040 ppm Based on Immunotoxicity"?

19           A.           Yes, I do.

20           Q.           Okay. And if you scroll or look  
21       down towards the bottom of that same column, it  
22       says:

23                       "If ambient exposures are kept at or  
24       below a minimum of the 8-hour ECEL of .0040 ppm,

1 EPA expects that workers and ONUs would be  
2 protected against not only the chronic non-cancer  
3 effects for autoimmunity described in this unit,  
4 but also effects resulting from acute non-cancer  
5 exposure (immunosuppression) and cancer."

6 Did I read that correctly?

7 A. For the most part, yes.

8 Q. Okay. Looking at this, would you  
9 agree that the -- that this document proposed that  
10 the ECEL value for occupational exposure to TCE be  
11 set at .0040 parts per million?

12 MS. McKEEVER: Objection to  
13 form.

14 THE WITNESS: Well, I haven't  
15 studied and reviewed and considered the  
16 entire document in the work that I've  
17 done in this case.

18 I agree with you that the  
19 sections of this document that are  
20 highlighted we just read -- you just read  
21 into the record seem to indicate that,  
22 but I don't have a context for the rest  
23 of the document.

24 BY MS. GJONAJ:

1           Q.           Okay. I'll represent to you that in  
2           this document they proposed that the -- that the  
3           ECEL value of .0040 parts per million be set as  
4           the primary -- strike that.

5                        So I'll represent to you that  
6           immunotoxicity was listed as the most sensitive  
7           endpoint in adults and the EPA used it to derive a  
8           proposed ECEL of .0040 parts per million. Okay?

9           A.           Okay.

10          Q.           Do you have any reason to recommend  
11          a higher workplace exposure limit than what the  
12          EPA proposed based on immunotoxicity?

13                       MS. McKEEVER: Objection to  
14          form and foundation.

15                       THE WITNESS: I don't. It's  
16          not -- it's not something that I did in  
17          context of this case or in other work  
18          that I've done.

19                       MS. GJONAJ: Okay.

20                       (Document marked for  
21          identification as McCabe Exhibit 15.)

22          BY MS. GJONAJ:

23          Q.           I'm marking as Exhibit 15 the  
24          Iavicoli 2005 paper.



1                   You've cited this paper in each of  
2     your reports; correct?

3           A.        I have, yes.

4           Q.        Okay. And this paper looked into  
5     the associations between TCE exposure and serum  
6     levels of three cytokines, including  
7     interleukin-2, interleukin 4, and  
8     interferon-gamma; is that right?

9           A.        Yes.

10          Q.        And they saw statistically  
11     significant increase in interleukin-2; is that  
12     right?

13          A.        Yes.

14          Q.        And a statistically significant  
15     increase in interon gamma; correct?

16          A.        Interferon-gamma, yes.

17          Q.        Interferon gamma?

18          A.        Yes. Yes.

19          Q.        And a significantly significant  
20     decrease in interleukin 4; is that correct?

21          A.        Yes, and I detailed that in my  
22     reports. For example, in the blood cancer report  
23     on page 33.

24          Q.        Okay. And turning to the first

1 page, the abstract, can you please read the  
2 conclusion that's the last four lines there?

3 A. "Conclusions: This study provides  
4 the first report on quantitative immune changes  
5 induced by occupational exposure to low levels of  
6 trichloroethylene and strongly suggests that  
7 exposure to this substance alters  
8 immunohomeostasis in humans with possible effects  
9 on health."

10 And then it gives the citation.

11 Q. Okay. And does immunohomeostasis  
12 refer to the balance and proper functioning of the  
13 immune system?

14 A. In part, yes.

15 Q. Okay.

16 A. And that's the context of it.

17 Q. Okay.

18 A. Sorry. Let me hear you. I'm sorry.  
19 In part, yes, but let me hear your question again.  
20 I apologize.

21 Q. Sure.

22 So my question was: Does  
23 immunohomeostasis refer to the balance and proper  
24 functioning of the immune system generally?

1           A.           Generally, yes.   Yes.

2           Q.           Okay.   So what they're saying here  
3 is TCE altered the balance and proper functioning  
4 of the immune system; is that correct?

5                       MS. McKEEVER:   Objection to  
6 form.

7                       THE WITNESS:   Well, again, I  
8 think it speaks for itself.

9                       That's exactly what it says,  
10 yes.

11 BY MS. GJONAJ:

12           Q.           Okay.   Okay.   And in your report,  
13 you state that the increased levels of  
14 interferon-gamma observed in TCE-exposed workers  
15 suggests that rather than -- rather than promoting  
16 tumor progression, exposure to TCE could foster a  
17 protective immune response; is that correct?

18           A.           A protective antitumor tumor  
19 regression as opposed to aligning with the idea  
20 where the concept of TCE through the mechanism of  
21 changes in the balances of the cytokines would  
22 promote tumor progression.   I mean, I can -- I can  
23 demonstrate to from my report, you know, a further  
24 explanation of the, you know, what that means.

1 Q. Okay.

2 A. But you --

3 Q. I'm going to stop you there. Yep.  
4 I'm just asking if that is what you wrote in your  
5 report.

6 And then I believe the answer was  
7 yes?

8 A. Yes.

9 Q. Okay. Can you point me to where in  
10 that Iavicoli paper the authors suggest that TCE  
11 exposure may project -- protect against tumor  
12 progression?

13 A. I don't think the authors say that  
14 in that report, so I can't.

15 Q. If the statement does not appear in  
16 the study, you would agree that your  
17 interpretation goes beyond what the authors  
18 concluded?

19 MS. McKEEVER: Objection to  
20 form.

21 THE WITNESS: Yes, in the  
22 context of the work that I was doing in  
23 this case and my application or  
24 my -- yeah, my consideration of this

1 study and other studies in addressing the  
2 purpose that I undertook in this case.

3 BY MS. GJONAJ:

4 Q. Okay. And are you aware of  
5 peer-reviewed research showing that  
6 interferon-gamma can have both pro- and  
7 antitumorigenic effects?

8 MS. McKEEVER: Objection to  
9 form.

10 THE WITNESS: Yes.

11 BY MS. GJONAJ:

12 Q. Would you agree that the immune  
13 system and tumor development involve nonmonotonic  
14 responses meaning --

15 MS. McKEEVER: Objection.  
16 Sorry.

17 THE WITNESS: Sorry.

18 MS. McKEEVER: (Laugh).

19 THE WITNESS: Did you get  
20 your question finished?

21 BY MS. GJONAJ:

22 Q. Okay. I did not.

23 Would you agree that the immune  
24 system and tumor development involve nonmonotonic

1 responses? By that I mean the same cytokines like  
2 interferon-gamma can have opposite effects  
3 depending on dose and timing?

4 MS. McKEEVER: Objection to  
5 form.

6 THE WITNESS: If that's what  
7 you mean by nonmonotonic in the context  
8 of the role of the immune system and  
9 imbalance -- imbalances in the control of  
10 the immune system through CD4+ T-cells,  
11 for example, producing cytokines like  
12 gamma-interferon, yes.

13 BY MS. GJONAJ:

14 Q. And would you agree that drawing  
15 conclusions about the potential protective effects  
16 of TCE exposure on tumor progression based solely  
17 on elevated interferon-gamma levels is an  
18 oversimplification of current immunological  
19 science?

20 MS. McKEEVER: Objection to  
21 form.

22 THE WITNESS: Well, yes, but  
23 that's not -- that's not what I did here.  
24 So -- so yes, I think -- so are you

1 asking me if I -- if -- if anyone,  
2 including myself, was to make a  
3 determination based on a single finding,  
4 would that be an oversimplification?

5 Yes.

6 BY MS. GJONAJ:

7 Q. So my question was a finding based  
8 solely on interferon-gamma levels?

9 A. Yes.

10 Q. Okay. If TCE were protective  
11 against cancer, would we not expect to see lower  
12 rates of cancer among TCE-exposed workers?

13 MS. McKEEVER: Objection to  
14 form.

15 THE WITNESS: It would depend  
16 on a lot of factors.

17 BY MS. GJONAJ:

18 Q. What factors would it depend on?

19 A. Dose of TCE exposure, timing of TCE  
20 exposure or modulation of -- of interferon-gamma  
21 by TCE exposure, if indeed that's relevant, and  
22 during the clinical course of the cancer.

23 Q. Okay. In your opinion, would the  
24 EPA have banned TCE if it were protective against

1 cancer?

2 MS. McKEEVER: Objection to  
3 form.

4 THE WITNESS: Well, no, but  
5 that's not what I'm saying there. I'm  
6 not -- I'm not saying that TCE is  
7 protective against. I'm not saying that  
8 we should all be taking TCE to protect  
9 ourselves from cancer. Right?

10 BY MS. GJONAJ:

11 Q. Okay.

12 A. What I'm saying is if, you know,  
13 from a single study and then there's multiple  
14 studies that I went through this type of analysis.  
15 If we look at the effects of, as Iavicoli did, on  
16 gamma-interferon, that -- that's counterintuitive  
17 or it does not support the hypothesis, as stated  
18 by Dr. Gilbert, that this -- that these types of  
19 studies support an immunological mechanism for TCE  
20 causing -- which one are we on? NHL? -- NHL,  
21 kidney cancer, or bladder cancer.

22 Q. Okay. And Dr. Gilbert did not cite  
23 Iavicoli in her report; correct?

24 A. She did not.



1           Q.           Okay. I'm going to turn to your  
2 blood cancer report.

3                       Page 15. If you could look to the  
4 last paragraph about four lines, down there is a  
5 sentence starting with "As an example."

6                       Can you read those next two  
7 sentences, please?

8           A.           "As an example, the reactive  
9 metabolites derived from the glutathione  
10 conjugation pathway of TCE and PCE have been shown  
11 to elicit downstream biochemical reactions as well  
12 as cellular disruption such as mitochondrial  
13 dysfunction and oxidative stress, and a myriad of  
14 other -- other effects that have been shown in  
15 animal in vivo and in vitro studies to be capable  
16 of causing genotoxic and nongenotoxic outcomes."

17          Q.           And the next sentence?

18          A.           "These findings provide a conceptual  
19 framework supporting the plausibility that such  
20 adverse toxic effects could be operant  
21 mechanistically in the carcinogenic process,  
22 generally."

23          Q.           Okay. So when you say this pathway  
24 provides a conceptual framework supporting

1     plausibility, you're saying it's biologically  
2     possible; right?

3                     MS. McKEEVER:   Objection to  
4     form.

5                     THE WITNESS:     Sure, I  
6     can -- sure, I mean, cellular biochemical  
7     reactions would be a component of  
8     biology.   So it's biologically possible.

9     BY MS. GJONAJ:

10            Q.       Now turning to page 54.

11                    In the very first line you say:

12                    "There is little -- little doubt  
13     that the tumor microenvironment in NHL or leukemia  
14     can be shaped by immune and inflammatory  
15     processes, which under various circumstances can  
16     either have a positive effect (i.e., anti-tumor)  
17     or, conversely, an unfavorable outcome (i.e.,  
18     tumor progression leading to clinical disease)."

19                    Did I read that correctly?

20            A.       You did.

21            Q.       Okay.   So you agree under some  
22     circumstances immune dysfunction can promote tumor  
23     development; correct?

24            A.       Under certain circumstances, the

1 immune system -- and I guess that includes immune  
2 dysfunction -- can promote tumor progression, yes.

3 Q. Okay. And then jumping to the next  
4 paragraph starting with "At best," you say:

5 "At best, the existing literature  
6 concerning TCE immunotoxicity provides a  
7 conceptual framework (i.e., background) for  
8 formulating a hypothesis that TCE causes NHL or  
9 leukemia through mechanisms that involve  
10 perturbations of the immune of the immune response  
11 or inflammatory processes."

12 Did I read that correctly?

13 A. You did.

14 Q. Okay. So you agree that immune  
15 dysfunction can -- I'm sorry. Strike that.

16 You're saying that it's  
17 scientifically plausible; correct?

18 MS. McKEEVER: Objection to  
19 form.

20 THE WITNESS: I'm saying it's  
21 a scientifically -- based on the  
22 background information that's known,  
23 some -- much -- much of which is in my  
24 report and some of which we already

1 discussed here, that the background  
2 information that would serve as the  
3 framework for proposing the hypothesis,  
4 that's sound and that's plausible.

5 It's just we don't -- we --  
6 the available science doesn't adequately  
7 test the hypothesis to prove one way or  
8 another whether the effects of TCE cause  
9 up-regulation or down-regulation of  
10 immune processes that lead to tumor  
11 progression versus tumor regression.

12 BY MS. GJONAJ:

13 Q. Okay.

14 A. And the reason for that is because  
15 the effects of TCE haven't been studied directly  
16 in the context of NHL or leukemia in terms of  
17 immune perturbations.

18 Q. So, in your view, unless there's  
19 direct experimental proof, the mechanism should  
20 not be considered?

21 MS. McKEEVER: Objection to  
22 form.

23 THE WITNESS: No, I'm not  
24 saying that.

1                   That would -- that would  
2                   certainly help, but -- but no,  
3                   that's -- my -- what I'm saying is not  
4                   limited to that.

5       BY MS. GJONAJ:

6               Q.           Okay. So am I -- I just want to  
7               make sure I understand.

8                   You're saying that immunotoxicity  
9               caused by TCE is a biologic -- is biologically  
10              a -- strike that.

11                   You're saying that immune disruption  
12              and oxidative stress caused by TCE are plausible  
13              mechanisms which can promote cancer, just not  
14              specific cancers?

15                   MS. McKEEVER: Objection to  
16              form.

17                   THE WITNESS: So -- so  
18              just -- just so we are on the same page.  
19              Right? So that we're using the words the  
20              same way.

21                   Anytime you add "plausible" to  
22              the question, in my -- in my view, you're  
23              teeing up a hypothesis. Right? Is it a  
24              plausible hypothesis?

1                   It's a plausible hypothesis.  
2           I don't have any problem with the  
3           plausibility of the hypothesis. It's  
4           that the hypothesis, when next thing we  
5           do after you formulate a plausible  
6           hypothesis, based on the background  
7           information that we have, for which we  
8           all know here that there's a lot. Right?

9                   That once -- once that  
10          plausible hypothesis is posed, it has to  
11          be tested, and in my analysis, the  
12          testing of that plausible hypothesis  
13          doesn't lead to a conclusion that through  
14          these perturbations of the immune system,  
15          TCE is causing NHL, bladder cancer,  
16          kidney cancer. That that's a -- that  
17          that's a -- that's an operative --  
18          operant -- operant mechanism.

19       BY MS. GJONAJ:

20               Q.           But you're not saying that it's  
21           impossible that it causes these cancers?

22               A.           Of course not.

23               Q.           Okay.

24               A.           It's a plausible hypothesis that

1 needs to be tested.

2 MS. GJONAJ: Okay. Marking as  
3 Exhibit 16.

4 (Document marked for  
5 identification as McCabe Exhibit 16.)

6 BY MS. GJONAJ:

7 Q. This is the Sir Bradford Hill's 1965  
8 lecture; is that correct?

9 A. Yes.

10 Q. And you cite to this in your report;  
11 correct?

12 A. Yes.

13 Q. Okay. If you look at page 298 under  
14 Plausibility, first column about two-thirds of the  
15 way down.

16 A. Yes.

17 Q. He says:

18 "It will be helpful if the causation  
19 we suspect is biologically plausible. But this is  
20 a feature I am convinced we cannot demand. What  
21 is biologically plausible depends upon the  
22 biological knowledge of the day."

23 Did I read that correctly?

24 A. You did.

1           Q.           Okay. So do you agree that Hill  
2 expressly said that plausibility is not something  
3 we should require before making a causal  
4 inference?

5                       MS. McKEEVER: Objection to  
6 form.

7                       THE WITNESS: You just read  
8 it. So, yes, I agree with that.

9 BY MS. GJONAJ:

10           Q.           Okay.

11           A.           I think -- I think Hill said that  
12 about each of the attribution elements under the  
13 Hill criteria.

14           Q.           Correct. Okay.

15                       So would you also agree that by  
16 Hill's standard, plausible means a mechanism is  
17 possible, reasonable, or consistent --

18                       MS. McKEEVER: Object.

19 BY MS. GJONAJ:

20           Q.           -- with the current scientific  
21 understanding, not that it has to be proven?

22                       MS. McKEEVER: Objection to  
23 form.

24                       THE WITNESS: I -- yeah, I



1 don't -- you know, I know that this --  
2 this aspect of Hill criteria and the word  
3 "plausibility" has been -- has been  
4 debated and has evolved over time, which  
5 is consistent with also what Hill is  
6 saying here, which is what is  
7 biologically plausible depends on the  
8 biological knowledge of the day. Right?

9 So I think in -- in my  
10 understanding and in my practice and the  
11 work that I do, as much as I'm aware of  
12 Hill criteria and plausibility and very  
13 much aware of what he's saying and what  
14 was said in this 1965 document, you know,  
15 I think the concept of plausibility has  
16 evolved more to be in aligning with what  
17 I said earlier.

18 That plausibility means that  
19 it's a hypothesis that -- that, you know,  
20 that is possible, but with the --  
21 certainly since 1965, the advances that  
22 have been made in molecular and cellular  
23 biology and the contributions of that to  
24 molecular epidemiology has really changed

1           what scientists, like myself and others  
2           who are working in this litigation, think  
3           about plausibility.

4                       MS. GJONAJ:   Okay.   Marking as  
5           Exhibit 17.

6                       (Document marked for  
7           identification as McCabe Exhibit 17.)

8   BY MS. GJONAJ:

9           Q.           This is the Fedak 2015 paper that I  
10          believe you cited to in your report regarding the  
11          modified Bradford Hill criteria --

12          A.           Yes.

13          Q.           -- is that correct?

14                       Can you turn to page 5.

15          A.           I'm there.

16          Q.           I'm reading from under Criteria 6,  
17          about four lines down it says:

18                       "Plausibility has historically been  
19          judged based on the presence of existing  
20          biological or social models that explain the  
21          association of interest.   Hill's criterion of  
22          plausibility is satisfied if the relationship is  
23          consistent with the current body of knowledge  
24          regarding the etiology and mechanism of disease."

1 And then he goes on to say:

2 "Hill admitted that this  
3 interpretation of biological plausibility was  
4 dependent on the current knowledge of the day."

5 Do you see that?

6 A. I do.

7 Q. Okay. So if a proposed mechanism is  
8 consistent with what we know about immunotoxicity  
9 in carcinogenesis, even though not proven, it  
10 would still meet the plausibility criterion under  
11 Hill?

12 A. No.

13 MS. McKEEVER: Objection to  
14 form.

15 THE WITNESS: No, that's not  
16 what that means.

17 BY MS. GJONAJ:

18 Q. What --

19 A. That's not even close to what that  
20 means.

21 Q. What does it mean?

22 A. It means just what it says there.

23 Is that --

24 Q. Okay.

1           A.           -- is what we -- I think the section  
2 Hill criterion -- "Hill's criterion of  
3 plausibility is satisfied if the relationship is  
4 consistent with the current body of knowledge  
5 regarding the etiology and mechanism of disease."

6                       So in that -- in that series of  
7 words "etiology and mechanism of disease" lies a  
8 lot of interpretative consideration about, well,  
9 what are the true mechanisms that cause the  
10 disease? What do we know about -- it's not --  
11 it's not is it consistent with it? Is it  
12 plausible? Is it possible? Is it, you know.  
13 Does the -- does the state of the science support  
14 that the etiology, the cause of the disease is --  
15 is due to a specific mechanism.

16           Q.           Okay.

17           A.           Not a possible mechanism but a  
18 specific mechanism and not --

19           Q.           So?

20           A.           Sorry.

21                       And not a generalizable mechanism.

22           Q.           So have you cited to any papers that  
23 are inconsistent with the current body of  
24 knowledge regarding the etiology and mechanism of

1 disease in your report?

2 MS. McKEEVER: Objection to  
3 form.

4 THE WITNESS: I don't think  
5 so, no.

6 You know, let's hear that.  
7 Let me -- maybe you can ask me that  
8 question so -- so that -- yeah, I  
9 want -- can you rephrase that question?

10 BY MS. GJONAJ:

11 Q. Well, I'm reading directly from the  
12 Fedak paper.

13 A. Okay.

14 Q. And he says:

15 "Hill's criterion of plausibility is  
16 satisfied if the relationship is consistent with  
17 the current body of knowledge regarding the  
18 etiology and mechanism of disease."

19 And I am asking if you cited to any  
20 studies that are inconsistent.

21 MS. McKEEVER: Objection to  
22 form.

23 THE WITNESS: Oh, right.

24 So I think I studied -- I

1           cited some many studies where the  
2           mechanism -- the mechanisms gleaned  
3           -- the mechanisms of immune perturbation  
4           gleaned from those studies are  
5           inconsistent with the etiology of the  
6           disease.

7                       So I guess I turn my answer  
8           around. It wasn't no. It's a yes. The  
9           answer is yes.

10       BY MS. GJONAJ:

11           Q.           Okay.

12           A.           That's the whole -- that's the whole  
13       crux of my argument and my opinions in this case.

14           Q.           Can you explain how that's  
15       inconsistent? I'm not sure I understand.

16           A.           We know -- we scientists, right, we  
17       all of us if you want it.

18           Q.           Uh-huh.

19           A.           Humans, who have spent the time to  
20       try to understand, know that the immune system  
21       plays a role in the etiology of non-Hodgkin's  
22       lymphomas. Right? So -- so that's -- that's  
23       known. That's well-established.

24                       We know that it's very complex, and

1 we know that in that complexity in our attempts to  
2 simplify it, right, there are protumorigenic and  
3 antitumorigenic events that occur.

4 We also know that when you bring TCE  
5 into the analysis that TCE -- the intersection  
6 between TCE immune perturbation, whether it be up  
7 or down, has not been studied directly in the  
8 contexture of non-Hodgkin's lymphoma. Right?

9 So, therefore, we have to assess  
10 mechanistic studies from other context to see if  
11 they apply to the etiology of non-Hodgkin's  
12 lymphoma, and my analysis and my reports  
13 demonstrate that they don't.

14 Q. So you've said that we know that  
15 immune suppression can increase the risk of NHL --

16 MS. McKEEVER: Objection to  
17 form.

18 BY MS. GJONAJ:

19 Q. -- correct?

20 A. I haven't said that. Right? That's  
21 my -- that's the jumping -- that's the "jumping  
22 in" point for me. Right? To -- that is -- that  
23 is a consideration. That other -- that other  
24 scientists and regulatory -- other scientists on

1 both sides are tasked in this case and regulatory  
2 agencies, as we have gone over here in detail  
3 today --

4 Q. Okay.

5 A. -- have indicated.

6 Q. Do you have reason to believe that  
7 immunosuppression does not increase the risk for  
8 NHL?

9 MS. McKEEVER: Objection to  
10 form.

11 THE WITNESS:  
12 That's -- that's -- that's such a  
13 open-ended vague statement that -- so it  
14 depends. Right? It depends.

15 We know -- scientists know  
16 that people who are -- and I indicated  
17 this in my report. We know that people  
18 who have congenital deficiencies in their  
19 immune system are, you know, have higher  
20 frequency -- frequency of development of  
21 non-Hodgkin's lymphoma.

22 We don't know that the immune  
23 suppression, if indeed it is immune  
24 suppression (indicates) caused by TCE,



1 causes non-Hodgkin's lymphoma.

2 We know that there are some  
3 data under some circumstances that one  
4 could lead to the conclusion that TCE is  
5 immunosuppressive, but we just don't know  
6 that that is -- that that context in  
7 those studies is relevant to  
8 non-Hodgkin's lymphoma, for example.

9 BY MS. GJONAJ:

10 Q. Okay. So do you agree that TCE is  
11 immunotoxic?

12 MS. McKEEVER: Objection to  
13 form.

14 THE WITNESS: It depends.  
15 Under certain circumstances it is, but --  
16 but there, you know, as -- right,  
17 potentially it is under certain  
18 circumstances.

19 BY MS. GJONAJ:

20 Q. All right. And the --

21 A. The question is -- the critical  
22 question, whether it's yours or not, -- I'm going  
23 to get it on the record -- is, is that  
24 immunotoxicity relevant to the etiology of

1 non-Hodgkin's lymphoma.

2 Q. Okay. I understand. I'm trying to  
3 break it down to make sure that I -- I see where  
4 you're going, but I want to try to break it down  
5 to make sure that I understand and that we get it  
6 on the record clearly.

7 So if you could just answer the  
8 question: Does TCE cause immunotoxicity?

9 A. It depends.

10 Q. Okay. And it depends on what?

11 A. Circumstances. What -- what  
12 immunological, you know, response, outcome we're  
13 looking at, what doses are. A variety of things.

14 Q. Okay. So the EPA found TCE to be  
15 immunotoxic and so much so that it was the most  
16 sensitive endpoint, according to the Federal  
17 Register that we looked at earlier today; right?

18 A. Right.

19 Q. Do you have any studies or any  
20 reason to disagree with the EPA?

21 A. I don't.

22 MS. McKEEVER: Objection to  
23 form.

24 BY MS. GJONAJ:

1 Q. Okay.

2 A. I don't and I don't have any reason  
3 to. The EPA is entirely different focus, as I  
4 understand it, than what I'm doing in this case.

5 Q. Okay. So sitting here today, you  
6 cannot say that TCE is immunotoxic?

7 MS. McKEEVER: Objection to  
8 form.

9 THE WITNESS: It depends.

10 BY MS. GJONAJ:

11 Q. Okay. At some level it is  
12 immunotoxic?

13 A. At some level --

14 Q. Okay.

15 A. -- and in some circumstances it is  
16 immunotoxic, and so the EPA, as I understand what  
17 the EPA does, they act on that in establishing  
18 regulatory policies. They use that science as a  
19 mechanism of or as a -- as a piece of information,  
20 right, to -- for what they do in terms of setting  
21 regulatory policy.

22 Q. Okay. And are you aware that the  
23 EPA used that Federal Register's proposed ECEL of  
24 .0040 parts per million based on immunotoxicity to

1 ban -- ban TCE entirely?

2 MS. McKEEVER: Objection to  
3 form.

4 THE WITNESS: It's a  
5 regulatory policy. Yes, I'm aware of it.

6 BY MS. GJONAJ:

7 Q. Okay. Are you aware of the EPA  
8 banning any other chemicals?

9 MS. McKEEVER: Objection to  
10 form.

11 THE WITNESS: I'm sure the  
12 EPA has banned lots of chemicals. As I  
13 sit here --

14 BY MS. GJONAJ:

15 Q. Can you say one?

16 MS. McKEEVER: Objection to  
17 form.

18 THE WITNESS: I can't as I  
19 sit here. I'm not -- I'm not evaluating  
20 what the EPA is doing in banning  
21 chemicals. It's not part -- it's not  
22 part of what I've done in this case.  
23 It's not part of what I do.

24 Hasn't EPA banned DDT? I

1 don't know. I just -- I don't know the  
2 answer to that.

3 BY MS. GJONAJ:

4 Q. You think that the EPA has banned  
5 DDT?

6 A. I don't. I'm telling you I don't  
7 know what the answer is.

8 Q. Okay.

9 A. What I'm telling you is the purpose  
10 of the work that the EPA does is different than  
11 the work that I do.

12 Q. Okay. So would you agree that TCE  
13 at some level is immunotoxic?

14 MS. McKEEVER: Objection to  
15 form.

16 THE WITNESS: And it still  
17 depends on what's -- immunotoxic in what  
18 way? In what immune endpoints? In what?

19 BY MS. GJONAJ:

20 Q. At what point does it become  
21 immunotoxic?

22 MS. McKEEVER: Objection to  
23 form.

24 THE WITNESS: Under -- under

1           circumstances where, you know,  
2           experimentally it's been shown to be  
3           immunotoxic. That it has a toxic effect  
4           on an immune endpoint.

5       BY MS. GJONAJ:

6           Q.           And you don't know what that is?

7                       MS. McKEEVER:   Objection to  
8           form.

9                       THE WITNESS:    I think I -- I  
10          think I detailed a lot of them in  
11          my -- my report.

12       BY MS. GJONAJ:

13          Q.           Does immunosuppression lead to an  
14          increased risk of leukemia?

15                       MS. McKEEVER:   Objection to  
16          form.

17                       THE WITNESS:    I think you  
18          already asked me that.

19                       My answer to that was, it's an  
20          extremely open-ended vague question that,  
21          yes, under -- it depends. Under certain  
22          circumstances, immunosuppression has been  
23          tied as a cause -- causative link or risk  
24          factor for NHL.

1 BY MS. GJONAJ:

2 Q. In your report, I believe you say  
3 that there's -- strike that.

4 In your report, you criticize  
5 Dr. Gilbert for not citing to an on point study  
6 regarding TCE immunotoxicity causing each of the  
7 four cancers that we're discussing today; right?  
8 Is that right?

9 A. Sounds --

10 Q. Okay.

11 A. Sounds right.

12 Q. So help me walk through what would  
13 actually be required to prove what you're asking  
14 for.

15 Here's my understanding.

16 So first you would need a group of  
17 humans exposed to TCE; correct?

18 MS. McKEEVER: Objection to  
19 form.

20 BY MS. GJONAJ:

21 Q. And then -- let me finish my  
22 question, please?

23 MS. McKEEVER: Sure. I  
24 thought you were finished.

1 BY MS. GJONAJ:

2 Q. So first you would need a group of  
3 humans exposed to TCE. Then we would need to  
4 identify what immune changes have been in those  
5 people. Then to prove causation, we would  
6 actually need to block those immune effects from  
7 one of those groups; right?

8 MS. McKEEVER: Objection to  
9 form.

10 THE WITNESS: (Pause).

11 BY MS. GJONAJ:

12 Q. Well, let's stop there.

13 To your knowledge, is there a way to  
14 selectively block TCE's immunotoxic effects?

15 MS. McKEEVER: Same objection.

16 THE WITNESS: In certain  
17 circumstances it depends and yes.

18 BY MS. GJONAJ:

19 Q. There is a way to selectively block  
20 TCE's immunotoxic effects?

21 A. There is an experimental way that  
22 has been shown that an immunotoxic effect of TCE  
23 can be blocked, can be prevented.

24 Q. And would that require either



1 genetic manipulation or some sort of immune  
2 modulating therapy to do that, or how is that  
3 done?

4 A. You're --

5 MS. McKEEVER: Objection to  
6 form.

7 THE WITNESS: You're asking  
8 me about experiments that Dr. Gilbert  
9 herself did or Dr. Gilbert and Sarah  
10 Blossom together did. Right?

11 They showed that if they used  
12 CYP1A1 knockout mice that they exposed to  
13 TCE that they didn't get autoimmune  
14 disease in the autoimmune-prone mice.  
15 Right? They showed. So that's a way of  
16 blocking TCE metabolism and the outcome.

17 They showed that.

18 BY MS. GJONAJ:

19 Q. They -- they -- let me stop you  
20 there.

21 They blocked TCE's immunotoxic  
22 effects, or they exposed some to TCE and compared  
23 them to the others, to the other mice?

24 A. Well, I mean, sound -- sound

1 experimental design would have comparison numbers.  
2 Right?

3 Q. Right.

4 A. So the question is -- so what  
5 Blossom and Gilbert and others have shown in  
6 animal models of disease of autoimmune disease,  
7 right, not in animal models of cancers, but that's  
8 a different thing. Right?

9 But what they've shown in animal  
10 models of or mouse models of autoimmune-prone mice  
11 that if they expose them to TCE that they get an  
12 autoimmune disease outcome and can and they have  
13 measured that that effect of TCE on exacerbating  
14 or initiating -- what's the word I want to use?  
15 Inducing -- inducing the autoimmune disease is  
16 through immune-mediated mechanisms.

17 Q. Okay.

18 A. And they also showed -- wait. I'm  
19 not done.

20 And they also showed, to your  
21 question is, can you specifically interfere with  
22 that? Yes, by interfering with the metabolism of  
23 TCE.

24 Q. Okay. I'm going to strike all of

1       that as nonresponsive.

2                       MS. McKEEVER:   I'm going to  
3               object to that.   You asked a very broad  
4               open-ended questions, and he was trying  
5               to explain.

6   BY MS. GJONAJ:

7               Q.           My question was:   Is there a way to  
8               selectively block TCE's immunotoxic effects?

9               A.           Yes, and I just gave you an example  
10              of a way.

11             Q.           Okay.   So in the mice studies, you  
12             are saying that she blocked the immunotoxic  
13             effects -- she -- strike that.

14                       You're saying in the Gilbert  
15             studies, she exposed a group of mice to TCE?

16             A.           Yes.

17             Q.           And then blocked those immunotoxic  
18             effects?

19                       MS. McKEEVER:   Objection to  
20             form.

21                       THE WITNESS:   In -- so she  
22             has four groups.   Right?

23   BY MS. GJONAJ:

24             Q.           Right.

1           A.           She has four groups. So there's two  
2 variables that are changing. TCE or not and  
3 CYP1A -- CYP1E1 expression or not.

4           Q.           Okay. You're not aware of any way  
5 to block TCE's immuno -- strike that.

6                       To your knowledge, is there any way  
7 to block TCE's immunotoxic effects in humans?

8           A.           Which --

9                       MS. McKEEVER: Objection to  
10 form.

11                      THE WITNESS: Which  
12 immunotoxic effects on humans?

13                      So the answer to your question  
14 is no, and I can't think of an  
15 immunotoxic effect in humans to -- to  
16 block.

17 BY MS. GJONAJ:

18           Q.           So if there were a hypothetical drug  
19 that could block immunotoxic effects, we would --  
20 you would then be able to track both groups for a  
21 decade or so and compare cancers; right?

22                      MS. McKEEVER: Objection to  
23 form.

24                      THE WITNESS: Actually, let

1 me. So --

2 BY MS. GJONAJ:

3 Q. Okay.

4 A. So sure. I mean, would -- so. Hang  
5 on.

6 Whether you'd be able to do it  
7 for -- you know, what the period of time you'd be  
8 able to do it. I mean, these are all details that  
9 it's a hypothetical. So I can't -- I can't answer  
10 this.

11 So this is -- this goes back to --  
12 what you're asking me about goes back to circa  
13 1905 with Koch's postulates -- Koch, K-o-c-h --  
14 right, which the way you show that in a sequence  
15 of A causes B causes C, that you come up with  
16 experimental approaches or therapies that show  
17 that if -- if you think that A causes B causes C,  
18 then you either interfere with A causing B or  
19 overexpress B.

20 I mean, these are all -- there's  
21 lots of clever experimental ways and clinical ways  
22 to do it, but it all comes down to that very  
23 simple concept.

24 Q. Okay. In humans, there is no --

1 using your example, in humans, there is no way to  
2 stop A being TCE from causing B immunosuppression?

3 MS. McKEEVER: Objection to  
4 form.

5 THE WITNESS: Sure, there is.  
6 Don't -- don't have people exposed to  
7 TCE.

8 BY MS. GJONAJ:

9 Q. Okay.

10 A. Or don't have people exposed to  
11 harmful levels of TCE. Right?

12 Q. But if you're trying to figure out  
13 if it's the immunotoxic effect that is the  
14 mechanism; right?

15 A. Right.

16 Q. You would have to expose the group  
17 to TCE and then somehow block that immunotoxic  
18 effect?

19 A. Well, we can't -- we can't do that.

20 MS. McKEEVER: Objection to  
21 form.

22 THE WITNESS: Sorry.

23 We can't do that right.

24 BY MS. GJONAJ:

1 Q. Right.

2 A. Because that's unethical.

3 Q. Okay.

4 A. So we rely on experiments of, I  
5 guess I would say, of convenience that people are  
6 exposed occupationally and what have you to  
7 environmental -- either occupational or  
8 environmental sources of TCE.

9 Q. But that's been done; correct?

10 MS. McKEEVER: Objection to  
11 form.

12 THE WITNESS: Well, that  
13 happens.

14 BY MS. GJONAJ:

15 Q. Right.

16 But you're saying that's not on  
17 point?

18 MS. McKEEVER: Objection to  
19 form.

20 BY MS. GJONAJ:

21 Q. Is that right?

22 A. I'm saying that's step -- I'm saying  
23 that's A.

24 Q. Okay. So there are EPI studies of

1 workers exposed to TCE that have shown an  
2 increased risk of NHL, is there not?

3 MS. McKEEVER: Objection to  
4 form.

5 THE WITNESS: I accept that  
6 that's a debatable issue that scientists  
7 on both sides of this case are charged  
8 with assessing that, whether or not the  
9 strength of that statement, not me.

10 BY MS. GJONAJ:

11 Q. Okay. So are you accepting the  
12 opinions of Dr. Shields and Dr. Goodman in stating  
13 that TCE is not causally associated with NHL?

14 MS. McKEEVER: Objection to  
15 form.

16 THE WITNESS:  
17 (Reviews document.)

18 We're back to the "jumping  
19 in."

20 BY MS. GJONAJ:

21 Q. Yes. Okay.

22 A. We're back to the "jumping in"  
23 statement, page -- page 6.

24 Page 6 of my NHL report where I



1 acknowledge that there are a string of plaintiff  
 2 experts -- Gilbert, Gondek, Bird, Mallon, Felsher  
 3 and Hu -- who have asserted that epidemiological  
 4 studies support an association between NHL or  
 5 leukemia and various Camp Lejeune VOCs alone or in  
 6 combination with other, and that others --  
 7 Dr. Julie Goodman and Dr. Peter Shields -- are  
 8 rebutting this assertion.

9 My "jumping in" place starts for me  
 10 addressing the question how.

11 Q. Okay. You mentioned studies of  
 12 TCE-exposed workers and then following to see if  
 13 there is an increased risk of NHL in those  
 14 TCE-exposed workers.

15 MS. McKEEVER: Objection to  
 16 form.

17 BY MS. GJONAJ:

18 Q. Correct? We just spoke about that.

19 A. I mean, I'm -- I'm aware that such  
 20 studies exist.

21 Q. Okay.

22 A. Yes.

23 Q. But you --

24 A. I'm aware -- I'm aware that there

1 are studies that suggest that that's not true.

2 Q. Okay. Okay. Fair.

3 But in your example that you used  
4 before, wouldn't that be jumping from A to C --

5 MS. McKEEVER: Objection.

6 BY MS. GJONAJ:

7 Q. -- right?

8 And skipping B regarding the  
9 mechanistic testing the actual mechanism?

10 MS. McKEEVER: Objection to  
11 form.

12 THE WITNESS: So yes, but we  
13 only got to A. So right. So there could  
14 be -- so you got it. Where I think we're  
15 going to -- let me see if this clarifies  
16 things so we're on the same page. Right?

17 So A is the exposure. C is  
18 the disease. The disease could be Z  
19 because there could be multiple steps in  
20 between. But just to make it the  
21 simplest, right, is that you've got an  
22 exposure and you have a disease. A and B  
23 and there's some mechanism -- sorry. A  
24 and C and there's some mechanism between

1 B. Right?

2 BY MS. GJONAJ:

3 Q. Uh-huh.

4 A. So -- so -- so you can -- you can --  
5 it's harder to study that and control it in human  
6 populations. Right? So what do you do? You  
7 study it in -- you do a lot of things and that's  
8 the point. There's multiple ways that you -- that  
9 I can think of as a scientist to do it, which  
10 haven't been done. Right?

11 So you do it in an animal model.  
12 You do it in an animal model of NHL. You do it in  
13 animal model of kidney disease. Not in an animal  
14 model of autoimmune disease. Right? You do it in  
15 an animal model of kidney disease, for example,  
16 and say, hey, can I get -- just like Dr. Gilbert  
17 with the autoimmune-prone mice. Right?

18 We know that autoimmune diseases are  
19 complex multifactorial diseases. Multifactorial  
20 meaning that there are extrinsic factors and  
21 intrinsic factors. Right?

22 The autoimmune-prone mice are  
23 genetically programmed in some way that we don't  
24 necessarily have to understand, but we know that

1 they are genetically programmed that as they age,  
2 they're going to get the disease. But if you give  
3 them A, if you expose them to TCE, you could  
4 accelerate that through immunological mechanisms.

5 None of that type of research has  
6 been done with cancers. So we don't have -- we  
7 don't have the animal disease component to get a  
8 causation through that. Right?

9 So now we come back to the humans  
10 and we say, well, what are believed to be the  
11 relevant steps in causing A to C in humans.  
12 Right? And are any -- are any of those informed  
13 by work that's been done in mice? Or are any of  
14 them on point and relevant if we borrow from other  
15 circumstances because it hasn't been studied in  
16 the context of the cancer. Are -- do they align  
17 with the mechanisms, the known mechanisms of the  
18 disease through the immune system?

19 And as I've indicated in my reports,  
20 they don't.

21 Q. You're -- okay.

22 But we went over quite a few  
23 examples in your report earlier where you say that  
24 it's -- I'm paraphrasing, you didn't use these

1 words -- but that it's possible, right, that  
2 the --

3 A. That it's a plausible hypothesis.

4 Q. Okay. And you're saying that this  
5 has not been tested in humans; correct?

6 MS. McKEEVER: Objection to  
7 form.

8 THE WITNESS: Hasn't been  
9 tested anywhere. Hasn't been tested in  
10 animals.

11 BY MS. GJONAJ:

12 Q. Okay. But whether --

13 A. Adequately.

14 Q. Whether TCE is immunotoxic has been  
15 tested in humans and in animals; correct?

16 MS. McKEEVER: Objection to  
17 form.

18 THE WITNESS: Yes.

19 BY MS. GJONAJ:

20 Q. Okay.

21 A. It's just the issue is it -- it  
22 depends. Is that -- is the immunotoxicity  
23 (indicates) that's been revealed from other  
24 studies outside the context of NHL, bladder

1 cancer, kidney cancer, is it relevant in the  
2 etiology or the findings of those immunotoxic  
3 effects of TCE. Are they relevant mechanistically  
4 to kidney cancer, bladder cancer, and NHL or  
5 leukemia, and the answer is they are not.

6 In part the answer that it's not is,  
7 these are very complex issues. It's not a matter  
8 of just, well, is it immunotoxic? Well, you know,  
9 sure, under some circumstances, but is the -- is  
10 the immunotoxic mechanism, any of the 9 KCs that  
11 came from the Dori Germolec paper. Right? Have  
12 they been shown to be relevant to the findings,  
13 the outcome to align with what's known about the  
14 mechanism of disease in humans, and the answer is  
15 no.

16 Q. Okay. There have been studies or  
17 are you aware of any studies that have looked at  
18 whether immunosuppression causes NHL?

19 A. Yes, and I cite them in my report.

20 Q. Okay. So there are studies that  
21 look -- both animal and human -- that look at  
22 whether TCE causes immune suppression; correct?

23 MS. McKEEVER: Objection to  
24 form.

1 THE WITNESS: Let me hear the  
2 question again. Sorry.

3 BY MS. GJONAJ:

4 Q. There are studies, both human and  
5 animal studies, that have looked at the  
6 association between TCE and immunotoxicity and  
7 found a positive association; is that correct?

8 MS. McKEEVER: Same objection.

9 THE WITNESS: The -- the  
10 answer to that question is yes.

11 BY MS. GJONAJ:

12 Q. Okay. And there are studies that  
13 have found that immune suppression can lead to an  
14 increased risk of NHL; is that correct?

15 MS. McKEEVER: Objection to  
16 form.

17 THE WITNESS: Under certain  
18 circumstances, yes.

19 BY MS. GJONAJ:

20 Q. Okay. So we have studies that link  
21 A and B?

22 MS. McKEEVER: Objection to  
23 form.

24 THE WITNESS: We don't.

1 BY MS. GJONAJ:

2 Q. TCE immunotoxicity?

3 A. That's not. So -- so but -- but  
4 it's not T -- B isn't -- B isn't broadly  
5 immunotoxicity. Right? B is some mechanism.  
6 Right? Immunotoxicity is this broad thing.  
7 Right? That can lead to immune stimulation,  
8 immunosuppression, no effect. Can have effects on  
9 immune events that we may characterize as  
10 immunotoxic that don't have anything to do with B.  
11 Right?

12 Yeah, it's immunotoxic, but the  
13 immunotoxicity doesn't inform A to B to C. Just  
14 means it's immunotoxic in a different context.

15 Q. Is it -- okay. That's -- I think  
16 we're -- okay.

17 There are studies that show A to B  
18 that it's immunotoxic. I'm not talking about a  
19 disease but there are --

20 A. Might be your B -- your B is  
21 immunotoxic. My B is not immunotoxic.

22 Q. What is your B?

23 A. Mechanism of disease. Some  
24 biochemical cellular event tied to the disease.



1           Q.           Is it the same mechanism that's tied  
2 to immunosuppression?

3                       MS. McKEEVER:   Objection to  
4 form.

5                       THE WITNESS:    Doesn't  
6 have -- doesn't have to be. It could be  
7 lots of things. Can it be? Yes. But it  
8 hasn't been shown to be. It hasn't been  
9 shown to occur in the context of A to B  
10 to C.

11 BY MS. GJONAJ:

12           Q.           Okay. In your report, you state  
13 that benzene exposure at high levels may cause AML  
14 in part through immune mechanisms; is that right?

15           A.           Yes.

16           Q.           Okay. What was the basis for that  
17 opinion?

18           A.           Benzene is known to be toxic to the  
19 bone marrow to the hematopoietic system. It's  
20 known through that mechanism to cause MDS,  
21 myelodysplasia syndrome, at high levels, and  
22 through those toxic events happening in the  
23 immune -- in the bone marrow and in the  
24 hematopoietic system has been tied to genotoxic

1 events leading to AML.

2 Q. Was there a single study --

3 A. So sorry.

4 So there we have A to B to C. Or we  
5 have A to B to C to D to disease. Right? That we  
6 have. It's a very specific. That's the point.  
7 We have a very specific series of events that can  
8 be tracked to link A to AML.

9 Q. Have similar studies not been done  
10 on testing that same association between TCE  
11 immunotoxicity or immunosuppression and CLL?

12 MS. McKEEVER: Objection to  
13 form.

14 THE WITNESS: My  
15 understanding of those experiments is  
16 either (A) they haven't been done or, if  
17 they have been done, they haven't  
18 provided the clear-cut interpretation and  
19 explanation that we have with benzene and  
20 AML or high dose benzene and AML.

21 BY MS. GJONAJ:

22 Q. Okay.

23 MS. McKEEVER: Take a break?

24 THE WITNESS: I'm good right

1 now.

2 MS. GJONAJ: You need a break?

3 MS. McKEEVER: I was just  
4 checking.

5 BY MS. GJONAJ:

6 Q. Okay. Dr. McCabe, would you agree  
7 that genotoxic means something can damage our  
8 DNA -- something that can damage our DNA or  
9 chromosomes?

10 MS. McKEEVER: Objection to  
11 form.

12 THE WITNESS: No.

13 BY MS. GJONAJ:

14 Q. What does genotoxic mean?

15 A. Genotoxic means that it's not that  
16 it can but that it did.

17 Q. Okay. And is mutagenicity --  
18 mutagenicity a more narrow concept that refers to  
19 permanent changes in a DNA sequence?

20 MS. McKEEVER: Objection to  
21 form.

22 THE WITNESS: As I understand  
23 it, yes.

24 BY MS. GJONAJ:

1 Q. Okay.

2 A. So not -- so another way of saying  
3 that, in my mind, is not all genotoxic events lead  
4 to mutations.

5 Q. Okay. So a chemical doesn't need to  
6 be mutagenic to be considered a carcinogen;  
7 correct?

8 A. I believe that's correct.

9 Q. Okay.

10 A. Or to contribute to the carcinogenic  
11 process.

12 Q. Okay. And do you agree that  
13 nongenotoxic substances do not direct -- that do  
14 not directly damage -- strike that.

15 Nongenotoxic substances that do not  
16 directly damage the DNA do not damage the -- I'm  
17 going to get it.

18 Nongenotoxic substances that do not  
19 directly damage the DNA can also influence  
20 cellular processes; is that right?

21 MS. McKEEVER: Objection to  
22 form.

23 THE WITNESS: Yes.

24 BY MS. GJONAJ:

1 Q. Okay.

2 A. Yes. I'm loud enough.

3 Q. (Laugh).

4 And a nongenotoxic substance can  
5 also be a carcinogen; is that correct?

6 MS. McKEEVER: Objection to  
7 form.

8 THE WITNESS: Or -- or  
9 contribute to the carcinogenic process.  
10 I don't want to get into a semantic thing  
11 for how some folks define carcinogen  
12 versus others.

13 BY MS. GJONAJ:

14 Q. Okay. Have you ever treated a  
15 patient with cancer?

16 A. No. I'm not a physician.

17 Q. Okay. Would you agree that  
18 immunotherapy is used to treat cancers?

19 MS. McKEEVER: Objection to  
20 form.

21 THE WITNESS: In some  
22 circumstances, yes.

23 BY MS. GJONAJ:

24 Q. Kidney cancer?

1           A.           In late-stage, metastatic advanced  
2 renal cell kidney cancer, yes.

3           Q.           Bladder cancer?

4           A.           Yes.

5           Q.           Leukemia?

6           A.           Yes.

7           Q.           Non-Hodgkin's lymphoma?

8           A.           Yes.

9           Q.           Okay.

10          A.           Generally speaking, yes --

11          Q.           Okay.

12          A.           -- to all of those.

13          Q.           So those therapies work by restoring  
14 the function of the immune system; is that right?

15                       MS. McKEEVER:   Objection to  
16 form.

17                       THE WITNESS:    That's --  
18 that's one mechanism at least that comes  
19 to mind that I would agree with you on.  
20 Sure.

21 BY MS. GJONAJ:

22          Q.           Okay.   So does --

23          A.           Hold on.   Yeah, so there's -- but  
24 that's not the only mechanism, but that is one

1 mechanism by which immunotherapies work in  
2 combating or as treatments as, yeah, as therapy  
3 modalities for cancer treatment, yes.

4 Q. All right. So doesn't that support  
5 the conclusion that the immune system -- that when  
6 the immune system is dysfunctional or suppressed,  
7 cancer is more likely to develop or persist?

8 MS. McKEEVER: Objection to  
9 form.

10 THE WITNESS: It supports  
11 what I think I kind of alluded to here  
12 particularly, for example, in kidney  
13 cancer, that progression to advanced  
14 metastatic disease progresses --  
15 progresses through immune dysfunction --  
16 dysfunctions that can be targeted by  
17 immunotherapies and are targeted by  
18 immunotherapies.

19 BY MS. GJONAJ:

20 Q. Okay. So would you agree that if  
21 restoring immune function helps eliminate cancer,  
22 then that implies immune suppression would play a  
23 role in promoting cancer?

24 MS. McKEEVER: Objection to

1 form.

2 THE WITNESS: No, that's not  
3 what that means.

4 BY MS. GJONAJ:

5 Q. Okay. Okay. I'm going to turn to  
6 your kidney cancer report.

7 So in your report, in your kidney  
8 cancer report, you state that there is some  
9 evidence that TCE causes kidney cancer in rodents  
10 through a genotoxic mechanism; is that right?

11 A. I believe that is right and I  
12 believe that is in my report, yes.

13 Q. Okay. But then you say there's  
14 uncertainty as to whether that applies to humans;  
15 is that right?

16 A. Yes.

17 Q. Okay. Can we go back to Exhibit 12.  
18 Is that the EPA 2020?

19 A. Okay.

20 Q. Okay. If you could flip to page  
21 252.

22 A. Got it.

23 Q. Can you read the first line under  
24 Genotoxicity, please?



1           A.           "The predominant mode of action  
2           (MOA) for kidney carcinogenicity involves a  
3           genotoxic mechanism through formation of reactive  
4           of GSH metabolites (for example, DCVC, DCVG)."

5                       Keep going?

6           Q.           Then it goes on to say "MOA is  
7           well-supported"; is that correct?

8           A.           Yes.

9           Q.           Do you disagree with the EPA  
10          statement?

11                      MS. McKEEVER:   Objection to  
12          form.

13                      THE WITNESS:    I don't.  I  
14          believe it's -- I don't disagree with  
15          that that's what it says.

16          BY MS. GJONAJ:

17          Q.           Can you read the EPA's statement  
18          immediately following that where it says "As  
19          toxicokinetic"?

20          A.           This mech -- mechinable -- sorry.

21                      "This MOA is well-supported, as  
22          toxicokinetic data indicates that these  
23          metabolites are present in both human blood and  
24          urine, and these metabolites have been shown to be

1 genotoxic both in vitro and in animal models --  
2 sorry -- in animal studies demonstrating  
3 kidney-specific genotoxicity."

4 And then it goes on to --

5 Q. You can stop.

6 A. -- cite the USEPA 2011 as well as  
7 the Cichocki study, which is part of Larry Lash's  
8 lab.

9 Q. Okay. Would you agree that the  
10 metabolites DCVC and DCVG have been detected in  
11 blood and urine?

12 A. In humans exposed to TCE, yes.

13 Q. And you're not claiming that these  
14 metabolites are not genotoxic, are you?

15 MS. McKEEVER: Objection to  
16 form.

17 THE WITNESS: I am -- I am --  
18 I am aware that there are studies that  
19 show under certain circumstances, as it  
20 indicates here, these are genotoxic  
21 substances. They are genotoxic  
22 metabolites of TCE.

23 BY MS. GJONAJ:

24 Q. And if you look at the bottom under

1 Conclusion, they say:

2 "There is clear evidence of a  
3 genotoxic MOA for kidney cancer."

4 Did I read that correctly?

5 A. You did.

6 Q. That does not seem like an ambiguous  
7 statement, does it?

8 MS. McKEEVER: Objection to  
9 form.

10 THE WITNESS: It does not  
11 seem like an ambiguous statement made in  
12 this document for the purposes of what  
13 the EPA was doing in the context of what  
14 they did in November of 2020 for their  
15 Risk Evaluation for Trichloroethylene.

16 BY MS. GJONAJ:

17 Q. Dr. McCabe, do you believe that a  
18 reliable epidemiological study is required in  
19 order to conclude that a chemical causes a  
20 particular disease?

21 MS. McKEEVER: Objection to  
22 form.

23 THE WITNESS: A hundred  
24 percent, no.

1 BY MS. GJONAJ:

2 Q. And are you familiar with the IARC  
3 guidelines for evaluating carcinogenic hazards?

4 A. Are you asking me about the  
5 guidelines that ultimately yield IARC's  
6 determination that something is Group 1, Group 2A,  
7 Group B?

8 Q. Correct.

9 A. Yes, I'm familiar with that.

10 Q. And --

11 A. Yes. Yes, I'm familiar with that.

12 Q. Thank you.

13 Are you aware that IARC can classify  
14 a chemical as a carcinogen based on mechanistic  
15 data even in the absence of sufficient human or  
16 animal data?

17 MS. McKEEVER: Objection to  
18 form.

19 THE WITNESS: Sorry. Let me  
20 hear that again, please.

21 BY MS. GJONAJ:

22 Q. Are you aware that IARC can classify  
23 a chemical as a carcinogen based on mechanistic  
24 data even in the absence of sufficient human or

1 animal data?

2 MS. McKEEVER: Same objection.

3 THE WITNESS: Without  
4 revisiting the guidelines myself, as I  
5 sit here, I think if IARC does that, it's  
6 uncommon that they do that. I'm not so  
7 sure that they do it to begin with.

8 BY MS. GJONAJ:

9 Q. Dr. McCabe, do you use the term  
10 "equipoise" in your everyday practice as a  
11 scientist?

12 A. I do not.

13 Q. Have you ever seen it in a published  
14 or peer-reviewed study?

15 A. I'm not sure about an peer-reviewed  
16 study like a peer-reviewed paper from a journal.  
17 My familiarity with the term comes from the ATSDR  
18 document, which I think you told me earlier was  
19 peer reviewed, or you represented to me earlier it  
20 was peer reviewed.

21 MS. GJONAJ: Okay. I'm  
22 handing you Exhibit 18.

23 (Document marked for  
24 identification as McCabe Exhibit 18.)

1 BY MS. GJONAJ:

2 Q. This is a 2017 study by Julie  
3 Goodman and some of her colleagues titled  
4 "Short-term ozone exposure and asthma severity:  
5 Weight-of-evidence analysis."

6 Have you seen that document before?

7 A. Well, first of all, it's a  
8 2018 -- 2018 study.

9 Q. Whoops.

10 A. And...

11 (Reviews document.)

12 I'm not sure if I've seen it before  
13 or not.

14 Q. Could you read the last sentence of  
15 the abstract, please, starting with "Taken  
16 together"?

17 A. "Taken together, the weight of  
18 evidence indicates that there is at least an equal  
19 likelihood that either explanation is true, that  
20 is, the strength of the evidence for a causal  
21 relationship between short-term exposure to  
22 ambient ozone concentrations and asthma severity  
23 is 'equipoise and above.'"

24 Q. Okay. Do you know what the legal

1 standard is in this case?

2 MS. McKEEVER: Objection to  
3 form.

4 THE WITNESS: I don't know.  
5 Yeah, I'm not -- I'm not certain about  
6 legal standards. I don't use legal  
7 standards in what I do. So the answer to  
8 your question is no, I'm not.

9 BY MS. GJONAJ:

10 Q. Okay.

11 A. I don't have any relevant expertise  
12 about the legal standard in this case.

13 Q. No one has ever told you what the  
14 legal standard is in this case?

15 MS. McKEEVER: Objection to  
16 form.

17 THE WITNESS: I think I read  
18 in Dr. Gilbert's reports some information  
19 about what may be the legal standard, but  
20 I really -- I didn't really pay too much  
21 attention to that because it doesn't mean  
22 anything to me.

23 BY MS. GJONAJ:

24 Q. Okay. And I assume you've never

1 seen the statute relating to the Camp Lejeune  
2 Justice Act; is that right?

3 A. I may have seen it, but, again, it's  
4 just that's the guiding statute for the case, not  
5 the work that I did in the case, as I understand.

6 MS. GJONAJ: Okay. Put that  
7 aside.

8 (Document marked for  
9 identification as McCabe Exhibit 19.)

10 BY MS. GJONAJ:

11 Q. Okay. I handed you what has been  
12 marked as Exhibit 19 and it's a copy of the Lan  
13 study published in "Carcinogens" in 2010?

14 A. Correct.

15 Q. And it's titled "Occupational  
16 exposures to trichloroethylene is associated with  
17 a decline in lymphocyte subsets and soluble CD27  
18 and CD30 markers"; is that right?

19 A. That's the title, yes.

20 Q. Have you reviewed this study before?

21 A. As I -- yes, and I indicated that in  
22 each of my reports.

23 Q. Okay. And this was a study with 80  
24 TCE-exposed workers and 96 controls; is that



1 right?

2 A. (Reviews document.)

3 Q. I think it's four or five lines down  
4 in the Abstract.

5 A. I don't know. I'm looking in the  
6 methods.

7 So, yeah, I mean, I think they have  
8 two phases of the study. One was greater than 40  
9 and then you're right. A cross-sectional study of  
10 80 workers currently exposed to TCE compared to 96  
11 unexposed controls.

12 Q. Okay. In your report, you describe  
13 the lymphocyte reductions observed in Lan 2010 as  
14 modest.

15 Can you explain what you mean by  
16 that?

17 A. Not remarkable, not biologically  
18 -- not evidencing biological or functional  
19 relevance.

20 Q. All right. Can you turn to the last  
21 page of that exhibit, which is Table 2 of the  
22 supplemental data.

23 A. Table 2 of the supplemental data.  
24 Yes.

1 Q. Okay. So the average NK, natural  
2 killer cell count, in the control group was 467;  
3 is that correct?

4 A. Yes.

5 Q. And then in the less -- less than 12  
6 parts per million group, it dropped to 370; is  
7 that correct?

8 A. Well, it was 370, yes.

9 Q. That's a drop; correct?

10 A. That's a drop in the number. We  
11 don't know --

12 Q. Okay.

13 A. -- that the NK cells are dropping.

14 Q. And then in the equal to or over 12  
15 parts per million, it's 282; is that correct?

16 A. Yes.

17 Q. Okay. So that's about a 20 percent  
18 increase would you say between the controls in the  
19 12 parts per million?

20 MS. McKEEVER: Objection to  
21 form.

22 BY MS. GJONAJ:

23 Q. Approximately.

24 A. (Reviews document.)

1                   20, 25 percent decrease in the low  
2 exposure group less than 12 relative to the  
3 control in the number.

4           Q.           Okay. And you would characterize  
5 that as modest, a modest decrease?

6           A.           Yes, for the reasons that I stated  
7 here --

8           Q.           Okay.

9           A.           -- and in my report.

10          Q.           You would agree that natural killer  
11 cells are part of the body's first line of defense  
12 in the immune system; correct?

13          A.           Yes, and I indicated that in my  
14 report.

15          Q.           Okay. And --

16          A.           In my reports.

17          Q.           Okay. And they -- so they play a  
18 critical role in detecting and destroying cells  
19 that have become cancerous; correct?

20                       MS. McKEEVER: Objection to  
21 form.

22                       THE WITNESS: They can.

23 BY MS. GJONAJ:

24          Q.           Okay.

1           A.           They are -- they are one cell type  
2           that has been shown. They're one cell type that's  
3           part of the innate immune system that have been  
4           shown to have a function in the early stages of  
5           immunosurveillance.

6           Q.           So is it your testimony that losing  
7           20-plus percent of your natural killer cells --  
8           strike that.

9                       Is it your testimony that losing 20  
10           percent of your natural killer cells has no  
11           potential consequences on immune function?

12                      MS. McKEEVER: Objection to  
13           form.

14                      THE WITNESS: Well, we don't  
15           know that the NK cells are lost.

16           BY MS. GJONAJ:

17           Q.           What is this telling us?

18           A.           Telling us that they're -- telling  
19           us the data, as I indicated in my report, in for  
20           all of these lymphocyte subsets and NK cells are  
21           normal, are within normal limits. So we don't  
22           know that -- we don't know that the TCE treatment  
23           caused the cells to be lost. We don't know the  
24           reason why.

1                   For example, lost in my -- in my  
2 mind when I hear you say "lost" it conjures up  
3 that the TCE caused NK cells to die.

4           Q.        Okay.

5           A.        Right?

6           Q.        Let me ask that.

7           A.        We don't know that.

8           Q.        Let me ask that differently.

9                   Is it your testimony that a 20  
10 percent decrease in natural killer cell counts has  
11 no potential consequences on immune function?

12                   MS. McKEEVER:  Objection to  
13 form.

14                   THE WITNESS:   That we know  
15 about.  Right?  That we know.

16                   And as I explained in my  
17 reports, there are no scientific studies  
18 that I'm aware of or that any plaintiff  
19 experts cited, including Dr. Gilbert,  
20 that people at the low end of normal NK  
21 cell, CD4+ cell, T-cell numbers, B-cell  
22 numbers are immunodeficient relative to  
23 people who are at a higher level that's  
24 within normal range.

1 BY MS. GJONAJ:

2 Q. Okay.

3 A. The normal ranges for these cell  
4 types vary dramatically within the human  
5 population.

6 Q. So you're saying that because they  
7 still fall within the normal range --

8 A. Tells me that they're normal.

9 Q. -- that?

10 A. Tells me these people aren't  
11 immunosuppressed. They're normal.

12 Q. And a 20 percent decrease between  
13 the exposed and unexposed population doesn't tell  
14 you anything --

15 A. That there's something --

16 Q. -- is misaligned?

17 MS. McKEEVER: Objection to  
18 form.

19 THE WITNESS: Tells --  
20 tells -- tells me something I don't -- I  
21 don't -- tells me that there's  
22 potentially something going on that's  
23 statistically relevant but doesn't mean  
24 that it's biologically or functionally

1           relevant, which is essentially the same  
2           thing that Dr. Mattigan was saying in his  
3           supplement, or one of his reports, that  
4           things that are -- that just because  
5           something is statistically significant  
6           doesn't mean that it's practically  
7           relevant.

8                       That's exactly the same thing  
9           I'm saying here.

10       BY MS. GJONAJ:

11           Q.           Okay. And to that point, the  
12       decrease in T-cells was statistically significant?

13           A.           Statistic --

14                       MS. McKEEVER: Objection to  
15       form.

16                       THE WITNESS: Statistically  
17       significant --

18       BY MS. GJONAJ:

19           Q.           Okay.

20           A.           -- but not -- but not -- but not  
21       biologically -- unknown -- unknown biologic  
22       relevance.

23           Q.           Okay. The same was true for the NK  
24       cells; is that correct?

1 MS. McKEEVER: Objection to  
2 form.

3 THE WITNESS: As I indicated  
4 in my report, the same for T-cells, CD4+  
5 B-cells, CD8+ T-cells, and NK cells.

6 BY MS. GJONAJ:

7 Q. Thank you.

8 And then looking to the Plasma  
9 Concentration section at the bottom of that table  
10 there?

11 A. Yes.

12 Q. SCD27 is a marker for lymphocyte  
13 activation; correct?

14 A. So soluble CD27 and soluble CD30 are  
15 markers of lymphocyte immune function in ways  
16 that, as I sit here right now, I'm not remembering  
17 what those are.

18 Well here. It's going to be here.  
19 Nope. It's going to be here.

20 (Reviews document.)

21 Yeah, that part.

22 Right. So both CD27 and CD30 are  
23 what are known as co-stimulation molecules on B  
24 and T-cells and, yes, the shedding of those



1 co-stimulator molecules is involved in lymphocyte  
2 activation.

3 Q. Okay. And for soluble CD27, the  
4 controls show 148.79; is that correct?

5 A. Yes.

6 Q. And in the less than 12 part per  
7 million group, it's 55.30; is that correct?

8 A. Yes.

9 Q. And that's a statistically  
10 significant decrease?

11 A. Yes.

12 Q. And would you say that's a more than  
13 60 percent reduction in soluble CD27?

14 MS. McKEEVER: Objection to  
15 form.

16 BY MS. GJONAJ:

17 Q. Approximately.

18 A. (Reviews document.)

19 Well, half of 148 would be what, 70  
20 something. So it's more than half.

21 Q. Okay. And are there any studies  
22 that you are aware of that would state a drop in  
23 more than half of soluble CD27 is considered  
24 modest?

1 MS. McKEEVER: Objection to  
2 form.

3 THE WITNESS: No, but to the  
4 contrary, I'm not aware of any studies  
5 that would say that it's biologically  
6 significant or biologically relevant or  
7 that what these findings on these  
8 particular markers in serum have anything  
9 to do with kidney cancer, bladder cancer,  
10 or NHL.

11 BY MS. GJONAJ:

12 Q. So the authors in this case describe  
13 that decline as striking and you call it modest.

14 So what is your basis for  
15 disagreeing with the authors?

16 MS. McKEEVER: Objection to  
17 form.

18 THE WITNESS: Statistical  
19 significance versus biological and  
20 functional relevance.

21 In other words, so what?

22 BY MS. GJONAJ:

23 Q. The authors state in the last line  
24 of the Abstract:

1                   "Given that altered immunity is an  
2       established risk factor for NHL, these results add  
3       to the biological plausibility that TCE is a  
4       possible lymphomagen."

5                   Do you see that?

6           A.           I do. I commented on it in my  
7       report.

8           Q.           Okay. And you disagree with that?

9           A.           I do. I think it's -- I think it's  
10      a gross overstatement of the significance, not the  
11      statistical significance, but the significance of  
12      the findings of this paragraph.

13          Q.           And just so I understand what part  
14      of that you disagree with, do you specifically  
15      take issue with the idea that immune suppression  
16      is a risk factor for NHL?

17          A.           Course not.

18          Q.           Okay.

19          A.           Or that it can be a risk factor for  
20      NHL.

21          Q.           Okay. Are you aware of any study or  
22      regulatory agency that says immune biomarkers must  
23      fall outside of normal clinical ranges to indicate  
24      toxicity?

1 MS. McKEEVER: Objection to  
2 form.

3 THE WITNESS: Sorry. Let me  
4 hear it again.

5 BY MS. GJONAJ:

6 Q. Are you aware of any study or  
7 regulatory agency that says immune biomarkers must  
8 fall outside of normal clinical ranges to indicate  
9 toxicity?

10 MS. McKEEVER: Same objection.

11 THE WITNESS: Yes, I don't  
12 think that's something a regulatory  
13 agency necessarily would do to begin with  
14 because they're really focused on these  
15 types of statistical associations in the  
16 work that they do and the determinations  
17 that they're doing. So -- so, no.

18 And then as far as any, you  
19 know, non-peer-reviewed studies that are  
20 not geared towards regulatory science,  
21 regulatory assessment, regulatory  
22 decision-making, I'm not aware of any  
23 that say that.

24 BY MS. GJONAJ:

1 Q. Okay.

2 A. Or don't say that.

3 Q. Okay.

4 A. What I can tell you is that, you  
5 know, from -- from my experience, these data  
6 support that the immune systems of all the  
7 individuals in across these studies. I can't say  
8 all the individuals because there's -- because we  
9 just don't know about all the individuals. We  
10 can't say any differences exist between the  
11 controls and the exposed.

12 But across -- and I think I said it  
13 probably more artfully in my report because I was  
14 careful in what I was saying for that reason,  
15 which is that because we don't have the raw data.  
16 That's what I'm getting at.

17 But -- but across the exposure  
18 groups, the data in the Lan paper tell me that  
19 these people, their immune systems are normal  
20 for -- for -- not just because of the data and the  
21 different lymphocyte subtypes being within normal  
22 ranges and the lack of any other experimental  
23 design here to look and see if these people are  
24 immunosuppressed.

1 Q. Okay.

2 A. But hold on. Let me --

3 Q. Oh, sorry.

4 A. Let me capture my -- my thought with  
5 where I was going there.

6 That -- oh, because, you know, from  
7 my experience working alongside clinical  
8 immunology labs, if we got these type of results  
9 in T-cell or B-cell or NK-cell number, we would be  
10 interpreting that as these are normal. These --  
11 these people are not immunosuppressed. They are  
12 immuno -- there's no evidence that they're not  
13 immunocompetent.

14 Q. So even still within normal limits,  
15 a 23 percent drop, which is what they indicate  
16 here, in lymphocyte count in a healthy population  
17 is not biologically meaningful, in your view?

18 MS. McKEEVER: Objection to  
19 form.

20 THE WITNESS: If you could  
21 keep saying drop, I'm going to have to  
22 correct you. Right?

23 BY MS. GJONAJ:

24 Q. Okay.

1           A.           We don't know that it's a drop. We  
2 know -- we know that the lymphocyte numbers and  
3 the different types of lymphocytes were measured  
4 in these people, in these different groups, and  
5 the results were obtained. They were tabulated,  
6 statistics were done on them, and we know that  
7 there's a difference. There's a lower number that  
8 is statistically significant between the two  
9 treatment groups.

10           Q.           Okay.

11           A.           That doesn't mean that they dropped.

12           Q.           And that is not biologically  
13 meaningful; correct?

14                       MS. McKEEVER:   Objection to  
15 form.

16                       THE WITNESS:    From -- from  
17 what I know because this is not a  
18 particularly sophisticated study. Right?  
19 We're not -- we're measuring lymphocyte  
20 numbers in the periphery in blood.  
21 Right?

22                       Most of them weren't activated  
23 to begin with under most circumstances  
24 and they're not -- has nothing to do with

1           what's happening in tissues in terms of  
2           the immune response. What may be  
3           happening in the kidney in the context of  
4           kidney cancer, for example. It's just  
5           not a very sensitive marker to begin  
6           with. That's why it ranges so in the  
7           human population.

8       BY MS. GJONAJ:

9           Q.           I'm sorry. Can we take a short  
10          break?

11          A.           Sure.

12                       THE VIDEOGRAPHER: Stand by.  
13                       We are off the record at  
14          15:45.

15                       (A recess was taken.)

16                       THE VIDEOGRAPHER: We are on  
17          the record at 16:21.

18       BY MS. GJONAJ:

19           Q.           Okay. Dr. McCabe, the EPA 2020 Risk  
20          Evaluation for TCE states that the urinary  
21          half-life of TCE is just over 50 hours in humans.

22                       Do you agree with that assessment?

23          A.           It's not something I've evaluated  
24          that I can agree with you or disagree with you.



1 (Document marked for  
2 identification as McCabe Exhibit 20.)

3 BY MS. GJONAJ:

4 Q. And I just handed you what I've  
5 marked as Exhibit 20; is that correct?

6 A. Yes.

7 Q. The Risk Evaluation on TCE from the  
8 ATSDR dated December 2020. If you flip.

9 A. So just so we have a clean record,  
10 it's from the EPA not from the ATSDR.

11 Q. Thank you. I appreciate it.

12 If you look to the section  
13 Elimination, three lines down it states:

14 "The half-life of PCE from  
15 blood-rich tissues, muscles, and adipose tissue is  
16 12 to 16 hours, 30 to 40 hours, and 55 to 65  
17 hours, respectively."

18 Did I read that correctly?

19 A. Yes, I think so.

20 Q. Okay. So do you agree that all  
21 metabolites of PCE, TCE, benzene, and vinyl  
22 chloride are eventually excreted in urine?

23 MS. McKEEVER: Objection to  
24 form.

1 THE WITNESS: No.

2 BY MS. GJONAJ:

3 Q. I think I asked that question wrong.

4 Do you agree that some metabolites  
5 of PCE, TCE, benzene, and vinyl chloride are  
6 eventually excreted in urine?

7 A. Yes.

8 Q. Thank you.

9 So if an individual were drinking  
10 and showering daily for six months using water  
11 contaminated with TCE and PCE, do you agree that  
12 the person would continuously retain TCE and PCE  
13 metabolites in their body over that entire  
14 exposure period?

15 MS. McKEEVER: Objection to  
16 form.

17 THE WITNESS: That's not  
18 something that I evaluated in this case.  
19 So I don't have an opinion on that that  
20 would allow me to agree or disagree with  
21 you.

22 BY MS. GJONAJ:

23 Q. You state that harmful chemicals in  
24 metabolites can accumulate in the urine and damage

1 the bladder lining triggering carcinogenic  
2 initiating events; is that correct?

3 A. (Reviews document.)

4 I stated that in my bladder cancer  
5 report, for example, in the context of the  
6 following:

7 "The mode of action underlying  
8 smoking risk and bladder cancer appears to be the  
9 accumulation of harmful chemicals and metabolites  
10 in the urine, which may damage the lining of the  
11 bladder, resulting in carcinogenic initiating  
12 events."

13 So I stated that in my report in the  
14 context of what's known about metabolites and  
15 chemicals associated with cigarette smoking.

16 Q. Correct.

17 And well -- strike that.

18 Can you point to any specific study  
19 supporting this accumulation mode of action for  
20 smoking?

21 MS. McKEEVER: Objection to  
22 form.

23 THE WITNESS: Not as I sit  
24 here, no.

1 BY MS. GJONAJ:

2 Q. Okay. Would you agree that the  
3 opinion that TCE and PCE metabolites excreted in  
4 urine could sit in the bladder and initiate a  
5 carcinogenic event conceptually similar to the --  
6 your smoking hypothesis here?

7 MS. McKEEVER: Objection to  
8 form.

9 THE WITNESS: Well, I don't  
10 think it's a hypothesis here. I think  
11 it's a statement.

12 And I think it's really an  
13 apples and oranges comparison, as I -- as  
14 I -- as I hear what you're asking me  
15 but -- yeah, that's -- that's my answer.

16 BY MS. GJONAJ:

17 Q. Would a fat soluble solvent like PCE  
18 persist in the bladder lining?

19 MS. McKEEVER: Objection to  
20 form.

21 THE WITNESS: No, my  
22 understanding is that that does not  
23 happen appreciably.

24 BY MS. GJONAJ:

1           Q.           Your understanding is that PCE  
2 cannot persist in the tissues of the bladder  
3 lining; is that right?

4           A.           It's not that it cannot. I just  
5 don't think it does so appreciably.

6           Q.           But again --

7           A.           And I'm not -- I'm not -- I'm not  
8 aware of any studies that say that it can or  
9 cannot. I just, based on the chemistry of PCE and  
10 the toxicokinetics of PCE, I don't -- I don't -- I  
11 don't see that being something that happens.

12          Q.           Okay. So sitting here today, you  
13 can't say for sure one way or the other?

14                       MS. McKEEVER: Objection to  
15 form.

16                       THE WITNESS: I would -- I  
17 would err more on that I'm pretty sure  
18 that I'm right that that doesn't occur  
19 and would want to see documents that  
20 convince me that I'm not.

21 BY MS. GJONAJ:

22          Q.           And you have not cited any studies  
23 one way or the other in your report?

24                       MS. McKEEVER: Objection to

1 form.

2 THE WITNESS: No, because that  
3 wasn't -- that wasn't a focus of what I  
4 was doing in my work.

5 MS. GJONAJ: Okay.

6 (Document marked for  
7 identification as McCabe Exhibit 21.)

8 BY MS. GJONAJ:

9 Q. I'm handing you what I have marked  
10 as Exhibit 21.

11 This is the Jubber 2023 study that  
12 you cite in your report; is that correct?

13 A. Yes.

14 Q. And Jubber identified certain  
15 exposures like dry cleaning, automotive work, and  
16 metal workings as associated with the increased  
17 risk of bladder cancer; is that right?

18 A. (Reviews document.)

19 Can I hear the question again,  
20 please?

21 Q. This study identified certain  
22 occupational exposures like dry cleaning,  
23 automotive work, and metalworking as associated  
24 with an increased risk in bladder cancer; is that

1 correct?

2 A. I think that's correct, yes.

3 Q. Okay. Are you aware whether any of  
4 those occupations involve exposure to chemicals  
5 such as PCE?

6 MS. McKEEVER: Objection to  
7 form.

8 THE WITNESS:  
9 (Reviews document.)

10 Which occupations are you  
11 asking me about?

12 BY MS. GJONAJ:

13 Q. You're referring to dry cleaning,  
14 automotive work --

15 A. Got you. Yes.

16 Q. -- and metalworking.

17 A. Certainly dry cleaning.

18 Q. Are you aware of whether any of  
19 these industries have also been associated with  
20 TCE exposure?

21 MS. McKEEVER: Objection to  
22 form.

23 THE WITNESS: Let me hear  
24 the -- let me see. Let me hear the jobs

1           again.

2       BY MS. GJONAJ:

3           Q.       Dry cleaning, automotive work, and  
4       metalworking.

5           A.       So dry cleaning, yes.   Automotive,  
6       maybe.   Metalworking, yes.

7           Q.       Okay.   And this article also  
8       identified printing processes as an occupational  
9       risk factor --

10          A.       Yes.

11          Q.       -- correct?

12                 Okay.   And do you know what  
13       chemicals have been implicated in printing  
14       occupation?

15                         MS. McKEEVER:   Objection to  
16       form.

17       BY MS. GJONAJ:

18          Q.       Let me ask that differently.

19          A.       Yeah.

20          Q.       Are you aware that TCE has  
21       historically been used in printing and associated  
22       with printing processes?

23                         MS. McKEEVER:   Objection to  
24       form.



1 THE WITNESS: Yeah, I don't  
2 think that -- that's not readily  
3 available in my -- in my brain as  
4 something I was aware of, no.

5 BY MS. GJONAJ:

6 Q. Okay. Do you believe that obesity  
7 is an established risk factor for bladder cancer?

8 A. My understanding is that -- and I  
9 think I reference it in my report, but American  
10 Cancer Society, other entities like that, Mayo  
11 Clinic is one that I rely on frequently in this  
12 type of work -- list obesity as a risk cancer for  
13 bladder cancer. Ah. Obesity as a risk factor for  
14 bladder cancer, yes.

15 Q. Are you aware that Jubber described  
16 the evidence linking obesity to bladder cancer as  
17 inconsistent?

18 MS. McKEEVER: Objection to  
19 form.

20 THE WITNESS: I mean, if he  
21 says that in the report, it will speak  
22 for itself. Right.

23 BY MS. GJONAJ:

24 Q. And do you believe diesel exhaust is

1 an accepted risk factor for bladder cancer?

2 A. It's not --

3 MS. McKEEVER: Objection to  
4 form.

5 THE WITNESS: It's not  
6 something I evaluated in the work that I  
7 did --

8 BY MS. GJONAJ:

9 Q. Okay.

10 A. -- and I didn't see that diesel  
11 exhaust particles was part of the Camp Lejeune  
12 litigation.

13 Q. Okay. And do you believe that  
14 exposure to PFOS is a risk factor for bladder  
15 cancer?

16 A. Again --

17 MS. McKEEVER: Objection to  
18 form.

19 THE WITNESS: -- it's not --  
20 it's not something that I've evaluated in  
21 the work that I've been doing.

22 BY MS. GJONAJ:

23 Q. Okay. I'm going to turn to your  
24 kidney cancer report.

1 A. Okay. Did you say kidney cancer?

2 Q. Yes.

3 A. Got it.

4 Q. And turning to page 5.

5 A. Okay.

6 Q. About halfway down the section on  
7 Purpose Statement, you say.

8 "As is discussed in Dr. Julie  
9 Goodman's general causation report for kidney  
10 cancer, epidemiology evidence does not support a  
11 causal association between TCE and kidney cancer  
12 except at very high occupational exposures over  
13 335 -- (i.e. over 335 part per million years) and  
14 does not support a causal association between the  
15 remaining VOCs and kidney cancer."

16 Do you see that?

17 A. I do.

18 Q. You don't offer an independent  
19 epidemiological opinion here; correct?

20 A. I do not.

21 Q. Okay. You're relying entirely on  
22 Dr. Goodman?

23 MS. McKEEVER: Objection to  
24 form.

1 THE WITNESS: I'm not relying  
 2 on Dr. -- I guess I could be relying on  
 3 Dr. Goodman, but I think, as I stated  
 4 earlier and also as appears elsewhere in  
 5 my kidney cancer report, it would be on  
 6 page -- now since I'm so crafty at  
 7 remembering where it is. It's on -- I  
 8 don't now see the term special.

9 Page 9 that, you know, that --  
 10 that I am -- I am aware that plaintiff  
 11 experts -- Gilbert, Mallon, Hatten,  
 12 Freeman, Bird -- assert that there are  
 13 epidemiologic studies that support an  
 14 association between kidney cancer, TCE,  
 15 PCE, benzene, and vinyl chloride alone.

16 Gilbert asserts that TCE  
 17 causes it based on epidemiological  
 18 studies, but also I've considered  
 19 Dr. Goodman and Dr. Shields' report in  
 20 the work that I did in "jumping in" to  
 21 address the questions that I did in this  
 22 litigation.

23 BY MS. GJONAJ:

24 Q. Okay. So my question was: You

1 didn't reach that conclusion independently. That  
2 was just citing to Dr. Julie Goodman's report?

3 A. I didn't --

4 MS. McKEEVER: Objection to  
5 form.

6 THE WITNESS: I didn't reach  
7 the conclusion independently or  
8 dependently. It's not a conclusion that  
9 I reached one way or another.

10 BY MS. GJONAJ:

11 Q. Fair.

12 Turning to page 34, about four lines  
13 down, you say:

14 "Risks for developing kidney cancer  
15 include genetic/hereditary factors as well as  
16 environmental/lifestyle factors."

17 Did I read that correctly?

18 A. Yes.

19 Q. What environmental factors do you  
20 believe increase the risk for developing kidney  
21 cancer?

22 A. (Reviews document.)

23 Alcohol. That's also -- I guess  
24 that would be a lifestyle factor as well.

1 Q. Uh-huh.

2 A. TCE, solvents. And I think I  
3 explain that in my report that there are some  
4 entities that do list TCE as an environmental  
5 factor, risk factor associated with kidney cancer.

6 Oh. What others? Smoking,  
7 environmental factor also, lifestyle factor.  
8 Those are ones that come -- that's what comes to  
9 mind, as I sit here.

10 Q. Okay.

11 A. I may have stated that in more  
12 detail elsewhere in my report. I just don't  
13 remember, as I sit here.

14 Q. All right. Turning to page 35, can  
15 you please read the paragraph starting with "The  
16 vast majority of patients"?

17 A. Sure.

18 "The vast majority of patients with  
19 kidney cancer are not known to have experienced  
20 appreciable exposure to TCE, alone, or in  
21 combination or -- alone, or in combination with  
22 PCE, benzene, or vinyl chloride. The vast  
23 majority of people have been exposed to TCE, even  
24 at high levels, are not known to have developed

1 kidney cancer. Moreover, the vast majority of  
2 people who have been exposed to TCE, even at high  
3 levels that may occur in occupational settings,  
4 have not been shown to display clinically apparent  
5 immune dysfunction. Hence, the characteristic  
6 polarization of the immune response that is  
7 characteristic of kidney cancer progression occurs  
8 independent of TCE exposure or exposure to other  
9 VOCs found at Camp Lejeune."

10 Q. Am I understanding correctly that --  
11 strike that.

12 Are you saying that unless the  
13 majority of people exposed to TCE get a cancer,  
14 are you suggesting that you can't prove causation?

15 A. No.

16 MS. McKEEVER: Objection to  
17 form.

18 THE WITNESS: Sorry.

19 No.

20 BY MS. GJONAJ:

21 Q. Okay. Explain -- explain what the  
22 purpose of that statement was.

23 A. That -- that -- I think -- I think  
24 I've stated this in my report and I think I've

1 testified about this already today.

2 That kidney cancer is an example of  
3 a disease that is multifactorial, multiple  
4 extrinsic factors and intrinsic factors  
5 continue -- contribute to the etiology of the  
6 disease, and together with that nugget of  
7 information, we know that the immune system and  
8 immune imbalances in the immune system play a role  
9 either in tumor progression or tumor regression.

10 So unpacking how TCE or any chemical  
11 or any risk factor singularly contributes to the  
12 disease mechanistically is -- is highly  
13 complicated. Conceptually complicated and  
14 complicated in our ability to be able to measure  
15 and understand it.

16 Q. Okay. You would agree that the vast  
17 majority of people who smoke cigarettes don't get  
18 lung cancer; correct?

19 A. Yes. Ah. I don't know that I --  
20 well, let me think about that. Sorry.

21 The vast majority of people that  
22 smoke. Yeah, I think that's true. Yes. Sorry.

23 Q. Okay.

24 A. Yeah.



1 (Document marked for  
2 identification as McCabe Exhibit 22.)

3 BY MS. GJONAJ:

4 Q. All right. Dr. McCabe, for the  
5 record, I've marked the bills and invoices that  
6 you've produced, I believe, in response to our  
7 deposition notice and the attached document  
8 request, and those are marked as 22, Exhibit 22.

9 Do those bills and invoices reflect  
10 all of your time that you have billed the DOJ for  
11 your work related to Camp Lejeune?

12 A. (Reviews document.)  
13 Through March 23rd.

14 Q. Okay. So there were additional  
15 invoices since March 23rd?

16 A. I don't know.

17 Q. Okay. If there were, can you  
18 provide those following the deposition?

19 A. Yes.

20 MS. GJONAJ: Okay. I don't  
21 have any more questions.

22 MS. McKEEVER: Okay. Let's  
23 just take a short -- hopefully very short  
24 break.

1 THE WITNESS: All right.

2 THE VIDEOGRAPHER: Stand by.

3 We are off the record at

4 16:44.

5 (A recess was taken.)

6 THE VIDEOGRAPHER: We are on

7 the record at 16:51.

8 EXAMINATION

9 BY MS. McKEEVER:

10 Q. Dr. McCabe, you were asked whether  
11 the invoices in Exhibit 22 reflect the time you  
12 billed to DOJ.

13 To be accurate, this is the amount  
14 of time Intertox has billed on your behalf, as is  
15 reflected in the invoices; is that right?

16 A. Yes.

17 MS. McKEEVER: No further  
18 questions.

19 MS. GJONAJ: No questions.  
20 Thank you for your time, Dr. McCabe.

21 THE WITNESS: Thank you.  
22 Nice meeting you both.

23 MS. McKEEVER: Thank you.

24 THE WITNESS: Thank you for

1           putting up with me.

2                       MS. McKEEVER:   Have a nice  
3           weekend.   Got you out of here before  
4           5:00.

5                       THE WITNESS:   I'm staying  
6           here.

7                       THE VIDEOGRAPHER:   All right.  
8           We are off the record at  
9           16:52.

10                      (Signature not waived, the  
11           deposition concluded at 4:52 PM.)

12

13                               \*           \*           \*

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ERRATA SHEET

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DECLARATION UNDER PENALTY OF PERJURY

I declare under penalty of perjury that I have read the entire transcript of my Deposition taken in the captioned matter or the same has been read to me, and the same is true and accurate, save and except for changes and/or corrections, if any, as indicated by me on the DEPOSITION ERRATA SHEET hereof, with the understanding that I offer these changes as if still under oath.

Signed on the \_\_\_\_\_ day of \_\_\_\_\_, 2025.

\_\_\_\_\_

MICHAEL J. McCABE, JR., PHD

1 CERTIFICATE OF REPORTER

2 DISTRICT OF COLUMBIA )

3 I, Denise Dobner Vickery, a  
4 Registered Court Reporter and Notary Public of  
5 the District of Columbia, do hereby certify that  
6 the witness was first duly sworn by me.

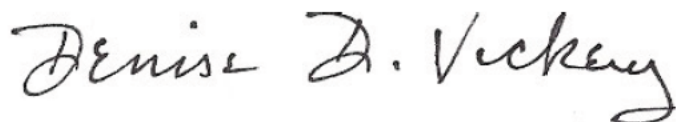
7 I do further certify that the  
8 foregoing is a verbatim transcript of the  
9 testimony as taken stenographically by me at the  
10 time, place and on the date herein set forth, to  
11 the best of my ability.

12 I do further certify that I am  
13 neither a relative nor employee nor counsel of  
14 any of the parties to this action, and that I am  
15 neither a relative nor employee of such counsel,  
16 and that I am not financially interested in the  
17 outcome of this action.

18

19

20



21

DENISE DOBNER VICKERY, CRR, RMR  
Notary Public in and for the  
District of Columbia


22

23

24

My Commission expires: March 14, 2028

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

DISCLAIMER: THE FOREGOING FEDERAL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS

COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

Veritext Legal Solutions is committed to maintaining the confidentiality of client and witness information, in accordance with the regulations promulgated under the Health Insurance Portability and Accountability Act (HIPAA), as amended with respect to protected health information and the Gramm-Leach-Bliley Act, as amended, with respect to Personally Identifiable Information (PII). Physical transcripts and exhibits are managed under strict facility and personnel access controls. Electronic files of documents are stored in encrypted form and are transmitted in an encrypted

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