

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA
IN AND FOR THE COUNTY OF MARICOPA

--000--

1	RAUL ZENDEJAS and ARACELI	)	
2	ZENDEJAS,	)	
3		)	
4	Plaintiffs,	)	
5		)	
6	vs.	)	Case No.
7		)	CV-2007-005399
8	SHELL OIL COMPANY; SHELL	)	
9	CHEMICAL, LP, individually	)	
10	and as Successor-in-Interest	)	
11	to SHELL CHEMICAL	)	
12	CORPORATION; CONOCOPHILLIPS	)	
13	COMPANY, VON VERDE CITRUS	)	
14	PACKING HOUSE, INC., an	)	
15	Arizona corporation; VON	)	
16	VERDE HARVESTING, INC., a	)	
17	dissolved Arizona	)	
18	corporation; and VON VERDE	)	
19	CITRUS GROWERS COOPERATIVE,	)	
20	INC., a dissolved Arizona	)	
21	Corporation,	)	
22		)	
23	_____Defendants._____	)	

VIDEOTAPED DEPOSITION OF
IJAZ S. JAMALL, Ph.D., DABT

THURSDAY, OCTOBER 15, 2009

REPORTED BY:
MARYANN H. VALENOTI, RPR
CSR #11266

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA
IN AND FOR THE COUNTY OF MARICOPA

--000--

1	RAUL ZENDEJAS and ARACELI	)	
2	ZENDEJAS,	)	
3		)	
4	Plaintiffs,	)	
5		)	
6	vs.	)	Case No.
7		)	CV-2007-005399
8	SHELL OIL COMPANY; SHELL	)	
9	CHEMICAL, LP, individually	)	
10	and as Successor-in-Interest	)	
11	to SHELL CHEMICAL	)	
12	CORPORATION; CONOCOPHILLIPS	)	
13	COMPANY, VON VERDE CITRUS	)	
14	PACKING HOUSE, INC., and	)	
15	Arizona corporation; VON	)	
16	VERDE HARVESTING, INC., a	)	
17	dissolved Arizona	)	
18	corporation; and VON VERDE	)	
19	CITRUS GROWERS COOPERATIVE,	)	
20	INC., a dissolved Arizona	)	
21	Corporation,	)	
22		)	
23	_____Defendants._____	)	

Videotaped deposition of IJAZ S. JAMALL,
Ph.D., DABT, taken on behalf of the
Plaintiff, at Risk-Based Decisions, 1540
River Park Drive, Suite 203, Sacramento,
California 95815; at 8:47 a.m., and
ending at 1:28 p.m., on Thursday,
October 15, 2009, before Maryann Hope
Valenoti, RPR, CSR #11266.

A P P E A R A N C E S

FOR THE PLAINTIFFS:

SHRADER & ASSOCIATES, LLP

BY: KEITH E. PATTON, ATTORNEY AT LAW

3900 ESSEX DRIVE, SUITE 390

HOUSTON, TEXAS 77027

713.782.0000

keith@shraderlaw.com

FOR THE DEFENDANTS:

HAYNES AND BOONE, LLP

BY: STAN PERRY, ATTORNEY AT LAW

ONE HOUSTON CENTER

1221 MC KINNEY STREET, SUITE 2100

HOUSTON, TEXAS 77010-2007

713.547.2039

stan.perry@haynesboone.com

ALSO PRESENT:

ALEX DIAS, VIDEOGRAPHER

I N D E X

WITNESS

EXAMINATION

IJAZ S. JAMALL, Ph.D., DABT

BY MR. PATTON

7, 188

BY MR. PERRY

177, 197

EXHIBITS

1	Notice of Deposition of Ijaz S. Jamall, Ph.D.	7
2	Curriculum Vitae of Ijaz Jamall, Ph.D., DABT	10
3	Letter, 10/5/09, to Stan Perry, from Rachel Wickland, with attached invoices	8
4	Article, "Is Benzene Exposure from Gasoline Carcinogenic?"	8
5	Article, "Is Benzene Exposure from Gasoline Carcinogenic?"	18
6	Benzene Health Review May 2003	41
7	Document entitled "Gasoline"	43
8	Concawe Review	
9	Technology Transfer Network Air Toxics Website, Benzene	48
10	Material Safety Data Sheet from Shell	51
11	NIOSH document, Benzene	63
12	Technology Transfer Network Air Toxics Website, Benzene	102
13	Copy of article, Service Station Attendants' Exposure to Benzene and Gasoline Vapors	103
14	Copy of article, Benzene Exposures During Gasoline Loading at Bulk Marketing Terminals	104
15	Copy of article, Gasoline Vapor Exposure During Bulk Handling Operations.	108
16	Chemico-Biological Interactions, Genotoxicity of Intermittent Co-Exposure to Benzene and Toluene in Male CD-1 Mice.	123
17	Benzene Exposure Calculations	152
18	Document, Climatic Wind Data for the United States	168

(Exhibits continued)

19	Original Paper, Increased Risk of	169
	Acute Myelogenous Leukemia and	
	Multiple Myeloma in a Historical	
	Cohort of Upstream Petroleum Workers	
	Exposed to Crude Oil	
20	Carcinogenic Effects of Benzene:	169
	An Update	
21	SEER Stat Fact Sheets, Cancer:	176
	Acute Myeloid Leukemia	
22	Shell Material Safety Data Sheet	179
	(Document substituted 10/20 by Counsel	
	for Defendant)	

--o0o--

1 P R O C E E D I N G S

2

3 THE VIDEOGRAPHER: Good morning. We're on
4 the video record at 8:47 a.m.. I'm Alex Dias from
5 U.S. Legal Support, Sacramento, California. The
6 phone number is (916)248-5608. This is a matter
7 pending before the Superior Court of the State of
8 Arizona, in and for the County of Maricopa in the
9 case captioned Raul Zendejas and Araceli Zendejas
10 versus Shell, Case Number CV-2007-5399.

11 This is the beginning of Tape Number 1,
12 Volume 1 in the deposition of Dr. Ijaz Jamall on
13 October 15, 2009. We are located at 1540 River
14 Park Drive, 203, Sacramento, California. This is
15 taken on behalf of the Plaintiff.

16 Counsel, would you please identify
17 yourself, starting with the questioning attorney.

18 MR. PATTON: Keith Patton for Plaintiffs.

19 MR. PERRY: Stan Perry for Shell.

20 THE VIDEOGRAPHER: Would the court
21 reporter please swear in the witness.

22

23 IJAZ S. JAMALL, Ph.D., DABT,
24 duly sworn, testifies under oath as follows:

25

1 THE VIDEOGRAPHER: Counsel, you may
2 proceed.

3 (Whereupon, Exhibit 1 was marked for
4 identification.)

5 EXAMINATION BY MR. PATTON

6 Q. Could you please introduce yourself for
7 the record.

8 A. My name is Ijaz Siraj Jamall. Jamall is
9 J-A-M-A-L-L.

10 Q. You are a toxicologist who holds a Ph.D.;
11 correct?

12 A. That is correct.

13 Q. Therefore, it's fair for me to call you
14 "Dr. Jamall"; correct?

15 A. That would be correct.

16 Q. What is a toxicologist?

17 A. A toxicologist is a person who studies the
18 harmful effects of chemicals on living organisms,
19 very broadly.

20 Q. Studies the harmful effects of chemicals
21 on living organisms?

22 A. Correct.

23 Q. And how many years have you been a
24 toxicologist?

25 A. Since '77, when I got my bachelor's in

1 toxicology.

2 Q. You were hired as an expert in this case
3 by Shell; correct?

4 A. Correct.

5 Q. How much money has Shell paid you for your
6 work in this case?

7 I've marked as Exhibit 3, your billing
8 file.

9 (Whereupon, Exhibit 3 was marked for
10 identification.)

11 BY MR. PATTON:

12 Q. You've charged Shell 60 or \$70,000 for
13 your time in this case?

14 A. I have.

15 Q. What were you hired to do in this case?

16 A. I was hired to review all of the
17 deposition material, the case reports, whatever
18 material was submitted by Mr. Perry, and also to
19 look at the entire scientific literature and see
20 whether the -- what my opinions were on the
21 allegations made by the Plaintiff, Mr. Zendejas.

22 Q. Before you took the time and charged Shell
23 60 or \$70,000 to do that job, who did you talk to
24 at Shell, outside of lawyers, to see what they had
25 already done about this case and what they had

1 already done to evaluate this information?

2 A. No one.

3 MR. PERRY: Object to form.

4 BY MR. PATTON:

5 Q. You didn't speak to anyone at Shell?

6 A. No, I have not.

7 Q. Did you speak to any toxicologists or ask
8 to speak to any toxicologists at Shell?

9 A. No, I did not.

10 Q. Do you know why you were hired to be a
11 toxicology expert in this case?

12 A. Because of my understanding of the
13 gasoline benzene literature.

14 Q. You wrote an article on gasoline and
15 benzene; did you not?

16 A. I wrote a peer-reviewed paper, yes.

17 Q. We have that peer-reviewed paper in front
18 of you; right?

19 A. That's correct.

20 Q. Have you worked for Shell before this
21 case?

22 A. No, I have not.

23 Q. Have you worked on behalf of the oil or
24 gasoline industry before this case?

25 MR. PERRY: Object to form.

1 THE WITNESS: No, but I did work for an
2 individual gas station owner on a case.

3 BY MR. PATTON:

4 Q. We marked as Exhibit 2 your curriculum
5 vitae or resume.

6 A. Correct.

7 (Whereupon, Exhibit 2 was marked for
8 identification.)

9 BY MR. PATTON:

10 Q. This lists all the projects you've worked
11 on and all the papers you've written?

12 A. Correct.

13 Q. This looks to be about maybe 20 or 30
14 pages; right?

15 A. Thirty-six pages.

16 Q. Thirty-six pages. Besides the paper you
17 wrote in 2007, have you ever written a paper
18 specific to benzene?

19 A. No, I have not.

20 Q. Have you ever testified in a lawsuit
21 specific to benzene?

22 A. No, I have not.

23 Q. Besides the paper you wrote in 2007, have
24 you written anything else about benzene that's
25 published?

1 A. No.

2 Q. Have you published anything else on
3 gasoline besides that paper?

4 A. No, I have not.

5 Q. Have you ever given the opinion in a
6 lawsuit or a project or otherwise that benzene
7 caused a person's disease?

8 A. I have not.

9 Q. After generating 60 or \$70,000 worth of
10 work in this case, did you arrive at a conclusion
11 as to whether Raul's benzene exposure from his
12 gasoline work played any role in his leukemia?

13 MR. PERRY: Objection.

14 THE WITNESS: I have.

15 BY MR. PATTON:

16 Q. What is that opinion?

17 A. The opinion is that it did not.

18 Q. Is it your opinion and are you telling the
19 judge and the jury -- you understand that we're
20 testifying in a conference room in your office
21 space?

22 A. Correct.

23 Q. Just as if you were in the courtroom; do
24 you understand that?

25 A. Correct, I understand that.

1 Q. Are you telling the judge and jury that
2 your opinion is that benzene and Raul's work with
3 Shell gasoline played zero role in his leukemia?

4 A. Well, zero is categorical, I would say
5 it's insignificant. It is a de minimis role.

6 Q. Do you believe Raul had insignificant
7 exposure to benzene?

8 A. Correct.

9 Q. I'm sorry, I wanted to let you finish.

10 A. I'm sorry.

11 Q. De minimis exposure, is that how you would
12 describe his exposure?

13 A. Yeah. I mean, he certainly had exposure
14 to benzene, but the exposure was insufficient, in
15 my opinion, to cause his disease.

16 Q. What about compared to other gasoline
17 distribution workers; do you have any opinions on
18 whether or not his exposure is de minimis compared
19 to others who performed jobs like he does loading
20 gasoline all day?

21 MR. PERRY: Object to form.

22 THE WITNESS: Yes, I would say it's de
23 minimis compared to that. Maybe, you know, a
24 little bit here and there, so there is a range of
25 exposures, but they're all associated with no

1 increased risk of acute myelogenic leukemia.

2 BY MR. PATTON:

3 Q. My question isn't about increased risk
4 yet, we'll talk about that.

5 A. Sure.

6 Q. But my question as far as gasoline
7 distribution workers go, guys like Raul get up in
8 the morning, they get dressed, they go to work, and
9 they load gasoline, or they work in a gasoline bulk
10 terminal. As far as that group or class of workers
11 go, would you consider Raul's exposure to benzene
12 via gasoline vapors and by working with gasoline de
13 minimis, compared to the others throughout the
14 country doing his job?

15 A. No, I would say it's probably comparable.

16 Q. Comparable?

17 A. Yeah, in the range of those other
18 exposures.

19 Q. Do you believe he's on the high end of the
20 range?

21 A. I don't believe he's at the high end of
22 the range.

23 Q. I mean, he's top loading without vapor
24 recovery; do you understand that?

25 A. I understand that.

1 Q. You've read all the depositions in this
2 case?

3 A. Most of them, yeah.

4 Q. Are you telling the judge and jury that
5 top loading gasoline without vapor recovery puts
6 you in the middle or lower range of harmful
7 exposure to chemicals?

8 A. I think the exposure to chemicals varies
9 quite a bit, and I think if you look at the
10 literature closely, you would see that
11 Mr. Zendejas' exposure was in that range. So with
12 regard to exactly where it was in that range, I
13 don't have an opinion. You know, I would have to
14 sort of go back and look at the individual papers,
15 but it certainly wasn't at the high end. I mean,
16 there were reports of much higher exposures.

17 Q. You believe Raul's exposure, the way he
18 loaded gasoline, certainly wasn't in the high
19 range; that's your phrase?

20 A. That is correct, that is my phrase.

21 Q. I saw in your couple boxes of materials
22 the paper by Carolyn Phillips. We talked to her in
23 that case; do you understand this?

24 A. Right, yes.

25 Q. She gave a deposition and testified.

1 A. Correct.

2 Q. She also wrote a paper back in 1977 --

3 A. Correct.

4 Q. -- about benzene and gasoline exposure
5 from bulk-handling operations.

6 A. Right.

7 Q. In her paper, I believe she concluded that
8 folks like Raul who top loaded without vapor
9 recovery are actually at the higher end of
10 exposure. Do you believe that to be correct?

11 A. For that period of time.

12 Q. For that period of time. What's different
13 now 30 years later?

14 A. The benzene concentrations in gasoline
15 have dropped enormously over the last 30 years. I
16 think that's supported by the entire scientific
17 literature.

18 Q. You are an industrial hygienist?

19 A. No, I'm not.

20 Q. Are you a chemist?

21 A. No, I'm not.

22 Q. Have you ever worked at a refinery?

23 A. No, I have never.

24 Q. Have you ever tested gasoline to see how
25 much benzene is in it?

1 A. Yes, I have.

2 Q. When did you do that?

3 A. Several times. I worked in about 40
4 projects with the gasoline contamination and on
5 several of them we've tested.

6 Q. You've done a handful of cases involving
7 gasoline contamination from like sites or
8 underground tanks, things of that nature?

9 A. That's correct.

10 Q. Have you ever worked on a case where a man
11 aboveground was being exposed to benzene vapors
12 from loading gasoline; have you ever worked on that
13 type of project --

14 A. I have not.

15 Q. -- besides this case?

16 A. I have not.

17 Q. Do you agree with me that in order to
18 appreciate the carcinogenic risks associated with
19 gasoline exposure, one must first understand the
20 health risks posed by exposure to benzene alone; do
21 you agree with that statement?

22 A. I agree with that statement.

23 Q. One of the things that I've heard in this
24 case from other experts hired by Shell, who were
25 paid money just as you have been today, is that the

1 chemical at issue here is gasoline, it's not
2 benzene; is that your opinion?

3 A. Yes, that's my opinion, too, and if I may
4 elaborate on that a little bit. There is an entire
5 literature on the toxicology of gasoline both in
6 animals, as well as the human epidemiology, and
7 there is similar literature that's probably more
8 extensive on benzene exposures in animals,
9 toxicology, as well as benzene epidemiology. So
10 because benzene is the only known carcinogen in
11 gasoline, the emphasis has been to focus on the
12 benzene content of gasoline.

13 Q. You believe that's fair?

14 A. I believe that's an approach. I don't
15 think it has any merit.

16 Q. There is a lot of literature out there
17 that deals with gasoline specifically, a lot of it
18 that deals with benzene, and then there's some
19 crossover literature; right?

20 A. Correct.

21 Q. You just said you don't believe it has any
22 merit.

23 A. Correct.

24 Q. Explain that to us.

25 A. When I wrote my paper and evaluated the

1 literature, and then subsequently have looked at
2 the more recent literature, the issue with benzene
3 and gasoline per se is that the benzene exposure
4 from gasoline is not high enough to cause any kind
5 of cancer, certainly not AML or CML.

6 The other issue is there are constituents
7 within gasoline, and all of them haven't been
8 identified, but toluene is one of them, and there
9 are probably others that inhibit the metabolism of
10 benzene to its toxic metabolites, the metabolites
11 that are putated to be carcinogenic.

12 Q. I looked at your paper, and you have it in
13 front of you, let me mark it as the next exhibit.
14 This will be Exhibit 5. This is your 19 -- I'm
15 sorry, is it a 2008 paper?

16 A. Yes.

17 (Whereupon, Exhibit 5 was marked for
18 identification.)

19 BY MR. PATTON:

20 Q. I think I said 2007 earlier, but we're
21 talking about your 2000 paper, "Is benzene exposure
22 from gasoline carcinogenic?"

23 A. Correct.

24 Q. You authored that paper; right?

25 A. Correct.

1 Q. Who paid you to write that paper?

2 A. No one.

3 Q. You just wrote it on your own?

4 A. Correct. My co-author, you can see here,
5 is the regulator for the State of California.

6 Q. You didn't charge anybody 60 or \$70,000 to
7 write that paper?

8 A. No, I didn't.

9 Q. Could you turn to Page 178.

10 A. Sure.

11 Q. Near the bottom of the left-hand column it
12 says, "In order to appreciate the carcinogenic
13 risks associated with gasoline exposure, one must
14 first understand the health risks posed by exposure
15 to benzene alone and examine its carcinogenic
16 mechanism of action."

17 A. Correct.

18 Q. You don't believe that has merit?

19 A. No, it has merit, that's why I did it in
20 the paper, but as you can see from the following
21 sections of the paper, it really doesn't bear on
22 the gasoline carcinogenicity or toxicity.

23 Q. Do you believe that it's plausible for
24 someone to contract a form of leukemia from working
25 with benzene and gasoline, or is it your opinion

1 that if you are exposed to benzene via gasoline,
2 like my client was, that there's just no risk of
3 leukemia?

4 MR. PERRY: Object to form.

5 THE WITNESS: I would say for someone
6 exposed to benzene via gasoline, there's no risks
7 of leukemia, no consistent risk of leukemia. As I
8 said, it's not zero.

9 BY MR. PATTON:

10 Q. You just qualified it, "no consistent
11 risk."

12 A. Yeah, and I'm happy to elaborate on that.
13 There are a few papers that suggest that exposures
14 to gasoline result in an increased risk of
15 leukemias, but those increased risks are usually in
16 very small groups and small populations. The
17 consistency of the literature suggests that there
18 isn't. So if you pick up the Kirkeleit paper or
19 the Jacobson paper that's in the pile, they
20 certainly show a statistically significant
21 increase, but they're very small.

22 Q. You agree with me that there is literature
23 that you reviewed for this case --

24 A. Right.

25 Q. -- which does show a statistically

1 significant increased risk of leukemia for gasoline
2 workers?

3 MR. PERRY: Object to form.

4 THE WITNESS: I agree with you.

5 BY MR. PATTON:

6 Q. However, you don't believe as a whole the
7 literature supports the idea that someone like my
8 client could get leukemia from his exposure to
9 benzene via gasoline?

10 A. That's correct.

11 Q. Your criticism is that the studies that
12 support the fact that it could cause it, those are
13 small populations, small groups?

14 A. That is correct.

15 Q. You agree with me that Raul Zendejas is
16 working at a small bulk terminal; right?

17 A. That is correct.

18 Q. Did you see in the information in this
19 case that he worked as a driver for a couple years
20 and he made a lot of small deliveries; do you see
21 that?

22 A. I did.

23 Q. Do you believe that he was exposed to
24 small or low concentrations of benzene?

25 A. Yes, he was, that's my opinion.

1 Q. How do you define a low concentration of
2 benzene in terms of exposure?

3 A. There are two forms of leukemia exposures.
4 So the standard epidemiological term is to consider
5 ppm years. If you look at ppm years, the Petty
6 report suggested an exposure of around 25 ppm
7 years, and I think that in itself was low, and if
8 you go through my critique of the Petty model, I
9 think it's more realistically in the half to two
10 and a half, maybe 2 ppm years.

11 Q. Okay. So Petty is an expert for the
12 Plaintiff in this case; right?

13 A. That is correct.

14 Q. He's an industrial hygienist; right?

15 A. Right.

16 Q. He is a chemist?

17 A. Correct.

18 MR. PERRY: Object to form.

19 BY MR. PATTON:

20 Q. He has done mathematical modeling?

21 MR. PERRY: Object to form.

22 THE WITNESS: Correct.

23 BY MR. PATTON:

24 Q. He's done -- other times in his career
25 he's done air monitoring; do you understand that?

1 A. Correct.

2 Q. Have you ever done any air monitoring?

3 A. Yes, I have.

4 Q. Have you ever done any air monitoring for
5 benzene?

6 A. No, I have not.

7 Q. Have you ever done any mathematical
8 modeling?

9 A. Absolutely.

10 Q. Did you do mathematical modeling in this
11 case?

12 A. No, I didn't.

13 Q. Why not?

14 A. Because I wasn't asked to, but I did look
15 through the Petty model and I have some comments on
16 it.

17 Q. You have some criticisms of it?

18 A. I have some criticisms of it, correct.

19 Q. So Petty thinks Raul was exposed to like
20 25 ppm years of benzene. You took a look at his
21 report, and you have some criticisms, and you think
22 he's exposed to .5 to 1 ppm?

23 A. .5 to 2 ppm. 2 ppm years, let's use the
24 right terminology.

25 THE VIDEOGRAPHER: Could you just adjust

1 your mic, please. Just a little higher.

2 BY MR. PATTON:

3 Q. Did you ask Shell if they've done any
4 mathematical modeling to determine how much benzene
5 they think Raul was exposed to?

6 A. No, I did not.

7 Q. Did you ask any other experts in this case
8 if they knew how much -- if they had opinions on
9 how much benzene Raul was exposed to?

10 A. No, not outside my company.

11 Q. Somebody in your company helped you figure
12 it out?

13 A. No, nobody helped me figure it out, but I
14 did run it by my statistician.

15 Q. Steve Petty used a Monte Carlo analysis
16 and that's -- you are laughing about it.

17 A. Well, I'm smirking more than laughing. Go
18 ahead.

19 Q. Why are you smirking?

20 A. Well, the Monte Carlo analysis is meant to
21 quantify a whole range of uncertainties in a model,
22 in any model. What Steve Petty did is he basically
23 looked at the uncertainty in the range of gasoline
24 compositions having predetermined that the
25 concentration from the MSDS sheets that he had was

1 2.4, and as we've seen it as evidence submitted by
2 Shell in this case, and looking at their CARB
3 regulation, CARB standing for California Air
4 Resources Board which regulates the content of
5 benzene in gasoline manufactured or sold in the
6 State of California, that concentration was at
7 least four-fourths higher than the actual data
8 suggests.

9 Q. So you believe that Petty is inaccurate
10 because he used an estimate of 2.4 percent benzene?

11 A. Yeah.

12 Q. Whereas you think it should be what range?

13 A. .6.

14 Q. .6. Did you see the MSDSs in this case?

15 A. Yes.

16 Q. They say that Shell gasoline contains,
17 depending on which MSDS you look at --

18 A. Sure.

19 Q. -- between zero to 3 percent or zero to
20 4 percent benzene.

21 A. Correct.

22 Q. You don't believe that's accurate?

23 A. No, I believe that's entirely accurate.
24 The problem is you can't do with a range what Petty
25 did to pick a number from that range.

1 Q. You are doing an estimate, you got to pick
2 a number at some point.

3 A. Correct, but -- let me see if I could
4 explain this sort of in relatively straightforward
5 terms. Sir, if I tell you that the height, average
6 height of males in Sacramento ranges from 18 inches
7 to 7 feet or 6'6", how do you pick what the average
8 height is?

9 Q. Why didn't you ask Shell what they would
10 pick?

11 A. Shell provided documentation of what their
12 benzene content of their gasoline was.

13 Q. Are you talking about those printouts from
14 last week?

15 A. Yeah.

16 Q. You know this case has been going on for a
17 couple years; right?

18 A. I understand that.

19 Q. Here we are a week or two ago, all of a
20 sudden Shell produces a half an inch of documents
21 with a bunch of numbers that you think represents
22 what?

23 A. The composition of benzene in their
24 gasoline.

25 Q. In 2000, in 2001 or what year?

1 A. There is a whole bunch of years. I
2 have -- independent of what Shell provided two
3 weeks ago, I have the California Air Resources
4 Board, as well as some EPA data on that.

5 Q. Raul worked in Arizona, he didn't work in
6 California.

7 A. Right, but he delivered gas mostly to
8 California, if I understand his deposition
9 correctly.

10 Q. He also loaded gas that went to Arizona;
11 didn't he?

12 MR. PERRY: Purchased in California, don't
13 misrepresent the record.

14 MR. PATTON: It's objection to form.

15 MR. PERRY: Objection to form. It
16 misrepresents the record. It was purchased in
17 California.

18 THE WITNESS: My understanding is that all
19 of the gasoline that was or most of it was
20 purchased from Imperial in California, which is not
21 terribly far from Yuma. As I said, I've also
22 looked at the Arizona data and that's included in
23 my file that's labeled "Gasoline Composition." So
24 there's no 2.4 percent.

25

1 BY MR. PATTON:

2 Q. You believe Petty's estimates are
3 inaccurate because he assigned an average value of
4 2.4; correct?

5 A. Correct.

6 Q. Do you understand, sir, that Petty did his
7 work in this case a year ago and then he
8 double-checked his work before he testified?

9 A. Correct.

10 Q. Do you understand that?

11 A. I do.

12 Q. Do you understand that during all that
13 time frame, Shell didn't produce any information
14 reflecting this .6 number that you all are now
15 claiming; do you understand that?

16 MR. PERRY: Object to form.

17 THE WITNESS: I understand that, and as I
18 said to you, I came up with that independent of
19 Shell from looking at the records from the
20 regulatory agencies that regulate the composition
21 of benzene in gasoline. I looked at the US EPA, I
22 looked at the Air Resources Board.

23 BY MR. PATTON:

24 Q. Did Shell provide you any information on
25 the benzene content that was sampled at the McNeece

1 facility?

2 A. Not that I recall.

3 Q. So this data that you are relying on shows
4 that the Shell gasoline being produced in
5 California during that time frame, you said
6 averaged .6?

7 A. Correct, and I have some calculations to
8 verify that.

9 Q. Who at Shell provided you with information
10 about what Shell believes to be the gasoline?

11 A. That was filing in the suit by and was
12 provided by Mr. Perry.

13 Q. My question is a little different. Is
14 there anyone, besides lawyers in this case, who you
15 talked to at Shell to verify this representation a
16 couple weeks ago that all of a sudden the Shell
17 gasoline has .6 percent?

18 A. No. Let me get some water.

19 THE VIDEOGRAPHER: Watch your mic.

20 BY MR. PATTON:

21 Q. Dr. Jamall, do you have any opinion on
22 what the phrase quote, unquote "high concentration
23 of benzene" means?

24 MR. PERRY: Object to form.

25 THE WITNESS: You would have to

1 contextualize it a little bit, whether you're
2 talking about it in toxicology terms or you're
3 talking about it in content in some material.

4 BY MR. PATTON:

5 Q. Do you have any opinion on what amount of
6 exposure to benzene via gasoline a person must have
7 for it to be considered quote, unquote "repeated"?

8 MR. PERRY: Object to form.

9 THE WITNESS: I'm sorry, I'm not familiar
10 with that term.

11 BY MR. PATTON:

12 Q. So let's say, for example, that instead of
13 being in a conference room today talking to you, I
14 wanted to go out in the industrial setting and I
15 wanted to be exposed to repeated concentrations of
16 benzene. Do you have any opinion on how much
17 benzene I need to be exposed to for how many days
18 for it to be considered "repeated"?

19 MR. PERRY: Object to form.

20 THE WITNESS: I don't know that term
21 "repeated," at least I'm not familiar with it as a
22 scientific term.

23 BY MR. PATTON:

24 Q. You're not familiar with the term
25 "repeated" as a scientific term?

1 A. Yeah. I mean, I understand it as English,
2 yeah.

3 Q. So similarly the phrase "high
4 concentrations of benzene," are you familiar with a
5 scientific definition of that number or do you need
6 to evaluate it in the context?

7 A. I need to evaluate in the context.

8 Q. We're going to come back to that.

9 A. Sure.

10 Q. Is there a difference -- first of all, how
11 would you define "leukemia"?

12 A. Leukemia is cancer of the blood-forming
13 cells, typically of the myeloid cells that starts
14 off in the bone marrow, and there are various
15 classes of leukemias. I'm happy to go into them.

16 Q. Raul has leukemia; right?

17 A. Correct.

18 Q. He has cancer of the blood-forming system?

19 A. Correct.

20 Q. Is Raul -- did you read the depositions
21 and look at some of the medical records in this
22 case?

23 A. I didn't -- I glanced at the medical
24 records, but I certainly read Dr. Carroll, Dr. Gore
25 and Dr. Natelson's depositions.

1 Q. As we sit here today, do you believe Raul
2 still has leukemia?

3 A. I believe it's in remission.

4 Q. But he still has leukemia?

5 MR. PERRY: Object to form.

6 THE WITNESS: Correct.

7 BY MR. PATTON:

8 Q. At what point will he not have leukemia;
9 do you know?

10 A. I'm not a clinician.

11 Q. Is there a difference between AML and
12 ANNL?

13 A. There is not.

14 Q. There is no difference between AML and
15 ANNL?

16 A. Correct.

17 Q. Acute non -- what's ANNL?

18 A. Acute nonlymphocytic leukemia, which means
19 excluding the lymphocytes, it's a older term and a
20 term that was used in Europe a lot, as opposed to
21 AML, and if you look at the ACS, yes, American
22 Cancer Society, they use it as a synonym.

23 Q. Is benzene a recognized human carcinogen?

24 A. It is.

25 Q. Do you know when ACGIH first designated

1 benzene as a recognized human carcinogen?

2 A. With regard to a specific date, I don't
3 recall the date.

4 Q. Do you know when any scientific or
5 environmental group designated benzene as a human
6 carcinogen?

7 A. I would guess in the late '70s, early
8 '80s.

9 Q. Late '70s it was a known or recognized
10 human carcinogen?

11 A. That's my understanding, yes.

12 Q. I'm not quarreling with you, that seems
13 accurate to me. I want to see if you had any
14 opinions specifically.

15 A. Yes, I think the first paper was Vigliani
16 and Saita.

17 Q. When was that?

18 A. I have it in my paper, if I could cheat
19 here. I believe it was '70, someplace. So yeah,
20 1964, the first paper, I stand corrected. It's in
21 the mid '60s.

22 Q. Tell me about your work here at
23 Risk-Based -- what's your company called?

24 A. Risk-Based Decisions, Incorporated.

25 Q. How many people work for your company?

1 A. Seven.

2 Q. Seven. Do each of you bill 60 or \$70,000
3 per project?

4 MR. PERRY: Object to form.

5 THE WITNESS: I'm not sure if that's
6 relevant.

7 BY MR. PATTON:

8 Q. Who are your clients here at Risk-Based
9 Decisions?

10 A. Anything from Fortune 100 companies, to
11 small mom-and-pop shops, to government agencies,
12 regulatory agencies.

13 Q. Have you ever evaluated a project and
14 concluded that there was a risk?

15 A. Yes.

16 MR. PERRY: Object to form.

17 BY MR. PATTON:

18 Q. Could you give us some examples of that?

19 A. Yeah, it's in my CV. So there's a case of
20 Hammerwood Avenue versus Thermo Electron, and I was
21 on the Plaintiff's side there where this fairly
22 large corporation, I think it's a Fortune 100
23 company, occupied my client's warehouse and had
24 manufacturing operations there for about 10 years
25 and left the property seriously contaminated.

1 Q. Let me ask my question in a different way.

2 A. Sure.

3 Q. You've been hired by Fortune 100

4 companies, you've been hired by industry --

5 A. Right.

6 Q. -- for projects; right?

7 A. Correct.

8 Q. You've done the work for them, you looked

9 at a site, or you looked at documents and you

10 arrived at a conclusion and gave an opinion?

11 A. Correct.

12 Q. When you did your work for industry, have

13 you ever concluded that there was an increased

14 risk?

15 MR. PERRY: Object to form, vague.

16 THE WITNESS: I've never done work for

17 industry where I had to conclude that there was an

18 increased risk. Are you specifically -- I'm just

19 asking a clarification. Are you asking about

20 litigation work?

21 BY MR. PATTON:

22 Q. Any work.

23 A. Yeah. See, most of the work we do is

24 cleanup of contaminated properties that are

25 contaminated by industry and we go in and clean it

1 up.

2 Q. When I looked through the -- when I looked
3 through your CV, I saw references to chemicals or
4 substances like mercury, arsonic, cadmium; right?

5 A. Right.

6 Q. What did you say the field of toxicology
7 deals with?

8 A. Harmful effects of chemicals.

9 Q. Mercury, does that have harmful effects?

10 A. Yes.

11 Q. How much mercury, if you and I didn't want
12 to sit in the conference room, we wanted to go play
13 around with mercury, how much mercury could we be
14 exposed to before we had a risk of harmful effects?

15 A. I don't know the number off the top of my
16 head, but it would depend whether it was organic
17 mercury or inorganic mercury. For organic mercury,
18 I think the number is fairly low, around 1 ppm on a
19 chronic exposure lever. For inorganic mercury,
20 it's sort of much more variable. It depends on the
21 dose.

22 Q. You think we could go work with some
23 mercury, as long as it's not above certain levels,
24 we would be safe?

25 A. Yes.

1 Q. What does mercury cause?

2 A. Mercury primarily causes neurotoxicity.

3 Q. So you believe we could -- do you believe
4 we could work with it below those numbers or those
5 levels that you just stated and we wouldn't have
6 any chronic toxicity effects?

7 A. Yeah.

8 Q. Then arsenic and cadmium, are there safe
9 levels of arsenic and cadmium?

10 A. Yes, there are.

11 Q. Those are numbers that are in the
12 literature somewhere?

13 A. Yeah, sure. Actually, my research on
14 cadmium showed that the levels that were
15 potentially harmful were lower than the regulatory
16 thresholds at the time.

17 Q. Do you believe there is a safe level of
18 exposure to benzene?

19 A. Yes, I do.

20 Q. What is that level?

21 A. That level in absolute benzene
22 concentrations is somewhere upwards of 10 parts per
23 million, and in terms of ppm years, it's somewhere
24 upwards of 40 ppm years.

25 Q. If someone is exposed to 40 ppm years,

1 cumulative of benzene, then what?

2 A. Then they're at increased risk of
3 developing acute myelogenic leukemia.

4 Q. That's for the cumulative risk?

5 A. That is correct.

6 Q. And then what about the short-term
7 exposure, you said 10 ppm?

8 A. That's correct. I've seen no evidence of
9 toxicity, no consistent evidence of toxicity below
10 10 ppm.

11 Q. If someone is consistently exposed to
12 benzene in levels above 10 ppm, then what?

13 A. Then it depends on what -- how many years
14 they're exposed, right, or the duration of
15 exposure. So there are two things here. So when
16 you talk of any chemical causing toxicity, you want
17 to look at the dose-response relationship, and the
18 dose-response relationship is one thing. The dose
19 rate is another thing, dose intensity or dose rate.
20 So, for example, if I'm sipping this cup of water
21 here as I'm talking to you, it's helpful, but if I
22 were to take the jug and just swig it down, I
23 probably would have some harmful effects of water.
24 So it's how quickly. In fact, a lady died in
25 Sacramento two years ago at a radio station from

1 drinking too much water too quickly.

2 Q. You could drink too much water and it will
3 kill you?

4 A. Right.

5 Q. Okay.

6 A. It's not you could drink too much water
7 and it will kill you, you could drink too much
8 water over a very short period of time and it will
9 kill you.

10 Q. If you and I wanted to die today from
11 drinking too much water, how much would we have to
12 drink?

13 A. It would probably vary between you and me,
14 but I would imagine -- although we are about the
15 same build and size, but I would imagine it would
16 be more than a few liters over a fairly short
17 period of time.

18 Q. If I drink below a few liters, could you
19 assure me that I'm not going to die from drinking
20 too much water?

21 A. Within reason, yes.

22 Q. You agree with me that different people
23 respond to chemicals and substances differently;
24 correct?

25 A. Absolutely.

1 Q. For instance, my sister is allergic to
2 cats.

3 A. Right.

4 Q. You put her in a room where there's cats
5 in there, she's going to sneeze; she's going to
6 have a physical reaction to the cats.

7 A. Correct.

8 Q. You put me in the same room, no problem.

9 A. Correct.

10 Q. Some people are allergic to peanuts;
11 right?

12 A. Correct.

13 Q. Some people could die from eating peanuts.

14 A. Correct.

15 Q. So do you have an opinion on how many
16 peanuts someone could eat before they're at risk of
17 dying from eating peanuts?

18 A. Not too many. If they have an
19 anaphylactic reaction to peanuts.

20 Q. So some people have the reaction where
21 they could eat a handful and they die.

22 A. Right.

23 Q. How is benzene different?

24 A. Benzene doesn't cause an anaphylactic
25 reaction.

1 Q. I know benzene doesn't cause an
2 anaphylactic reaction. Benzene causes leukemia;
3 right?

4 A. That's correct.

5 Q. Why is benzene different from peanuts or
6 pet dander?

7 A. Because the mechanism of the disease is
8 totally different.

9 Q. Explain that.

10 A. Sure. So when you have an allergin like
11 pet dander or peanuts to which someone is acutely
12 sensitive, then what happens is that when they
13 ingest or inhale that substance -- by the way, it's
14 not pet dander, it's actually saliva from the pet
15 on the dander -- the body reacts by these immune
16 cells coming into play to fight this allergin, and
17 it's actually the overproduction of the chemicals
18 from these immune cells that typically causes the
19 anaphylactic shock.

20 Q. Sir, I'm going to mark as Exhibit 6, a
21 document that I found in your file.

22 (Whereupon, Exhibit 6 was marked for
23 identification.)

24 BY MR. PATTON:

25 Q. It's a Benzene Health Review May 2003. It

1 says here benzene is classified as a human
2 carcinogen; you agree?

3 A. I agree.

4 Q. It says, "It is considered to be a
5 genotoxic carcinogen." What's that mean?

6 A. "Genotoxic carcinogen" means it effects
7 the genes. It causes DNA mutations.

8 Q. Which could ultimately lead to leukemia?

9 A. To cancers, yes.

10 Q. To cancers. It says, "It is considered to
11 be a genotoxic carcinogen for which no threshold
12 has been established," and it cites the EPA 2000
13 and the World Health Organization 2000. Do you see
14 where I've marked that?

15 A. Correct.

16 Q. You disagree with that?

17 A. Yes, I do.

18 Q. You disagree --

19 A. I disagree with the part that there is no
20 threshold.

21 Q. EPA says there's no threshold?

22 A. Yeah, I disagree with that.

23 Q. World Health Organization, they say no
24 threshold; you disagree?

25 A. I disagree.

1 Q. Individuals employed in industries that
2 manufacture or use benzene may be exposed to the
3 highest levels of benzene; do you agree?

4 A. Yes, I agree.

5 Q. Raul Zendejas is employed in the
6 gasoline -- was employed in the gasoline
7 distribution industry; do you agree?

8 A. Yes, I agree.

9 Q. Do you believe that he was exposed -- he
10 was in an industry with high occupational exposure
11 to benzene?

12 MR. PERRY: Object to form.

13 THE WITNESS: Relative to whom?

14 BY MR. PATTON:

15 Q. Relative to other industries.

16 A. Yeah.

17 MR. PATTON: I'll mark as Exhibit 7, a
18 document about gasoline.

19 (Whereupon, Exhibit 7 was marked for
20 identification.)

21 BY MR. PATTON:

22 Q. Could you tell us what this document is?

23 A. This I believe is an ACGIH document on
24 gasoline.

25 Q. Could I see that?

1 A. Sure.

2 Q. It says here, "Because benzene is the most
3 significant potent health hazard found in gasoline,
4 benzene deserves special consideration in
5 establishing a TLV," that's a threshold limit
6 value; right?

7 A. Correct.

8 Q. Do you believe that benzene is the most
9 significant and potent health hazard found in
10 gasoline?

11 A. I do.

12 Q. You had a file called -- is it Concawe?

13 A. Concawe.

14 Q. Concawe. C-O-N-C-A-W-E. What is Concawe?

15 A. Concawe is the European equivalent of the
16 API, American Petroleum Institute.

17 Q. What is the API?

18 A. The American Petroleum Institute.

19 Q. Okay. What do they do?

20 A. They're a consortium of industries in the
21 petroleum business.

22 Q. And they put together the resources and
23 they research things and give input to the
24 government regulatory agents on chemicals; right?

25 A. That's correct.

1 Q. This was in your file; correct?

2 A. Correct.

3 MR. PATTON: I'll mark this as Exhibit 8.

4 (Whereupon, Exhibit 8 was marked for
5 identification.)

6 BY MR. PATTON:

7 Q. Could you read the part that you
8 highlighted and you circled that; correct? I
9 didn't do that before we came in here.

10 A. Sure. It says, "Group 3 to 9," which is a
11 classification, "Gasoline streams, carcinogenic
12 unless benzene content less than .1 percent," and
13 this is from Concawe April 1993.

14 Q. So in 1993, the European group of oil and
15 gasoline manufacturers and chemical companies, they
16 believed gasoline streams were carcinogenic, unless
17 the benzene content was less than .1 percent?

18 MR. PERRY: Object to form.

19 THE WITNESS: Yes.

20 BY MR. PATTON:

21 Q. You believe that the gasoline that Shell
22 was selling to McNeece Brothers had .6 percent?

23 A. Approximately, yes.

24 Q. And Petty, our expert, believed it had an
25 average of 2.4 percent?

1 A. That's correct.

2 Q. Your number of .6 is above .1 percent;
3 right?

4 A. Right.

5 Q. So according to the European Concawe?

6 A. Right --

7 Q. -- the European oil group, they believe
8 that a gasoline stream would be carcinogenic;
9 right?

10 A. Right.

11 MR. PERRY: Object to form.

12 BY MR. PATTON:

13 Q. You disagree with that?

14 A. They disagree with that because you read
15 it out of context. If you read all the papers that
16 came out of there, including the Concawe papers
17 evaluating the health risks, they don't show any
18 health risk in gasoline-exposed workers.

19 Q. Hold on, I'm not trying to read anything
20 out of context. If you could hold that up and show
21 it to the camera.

22 A. That's correct, there's three pages there.

23 Q. Three pages there.

24 A. Right.

25 Q. Flip to the page I'm talking about.

1 A. Correct, I'm looking at the page you're
2 talking about, it's Page 3.

3 Q. It says, "A gasoline stream --"

4 A. I'm agreeing with you, "Gasoline stream
5 carcinogenic unless benzene content less than .1
6 percent." That's a product classification.

7 Q. A product classification?

8 A. Right.

9 Q. Could we clarify the gasoline that Shell
10 was putting into the system that Raul worked with;
11 could we classify that as gasoline above .1
12 percent?

13 A. Yes, we can.

14 Q. So, therefore, under Concawe's logic, it's
15 carcinogenic?

16 A. As of 1993.

17 Q. Did they change their view on that?

18 A. Yes.

19 Q. When did they change it?

20 A. A few years later, '96-'98, in that time
21 frame.

22 Q. Do you agree that measurements of benzene
23 in an individual's breath or blood could estimate
24 personal exposure?

25 A. Yes, it can.

1 Q. That's to say that if someone has too many
2 cocktails at dinner and is driving home and the
3 police pull him over, they could give him a
4 breathalyzer, they could analyze how much ethanol
5 or alcohol or cocktails in the person's breath.

6 A. Correct.

7 Q. Similar to that, means are available to
8 take a breath test of workers who are working
9 around benzene and determine their level of
10 personal exposure; correct?

11 A. Correct.

12 Q. It says, this is a -- this is an EPA
13 document, this was in your file, right, I'll mark
14 it as Exhibit 9; correct?

15 A. Correct.

16 (Whereupon, Exhibit 9 was marked for
17 identification.)

18 BY MR. PATTON:

19 Q. It's in your file; right?

20 A. Correct.

21 Q. It says, "Assessing personal exposure.
22 Measurement of benzene in an individual's breath or
23 blood."

24 A. Correct.

25 Q. So you could test a person's blood, too?

1 A. Correct.

2 Q. You could determine how much benzene
3 they've been exposed to?

4 A. Correct.

5 Q. Did Shell provide you any information in
6 this case wherein they've analyzed the benzene
7 exposure experienced by gasoline distribution
8 workers by looking at their breath?

9 A. No, because they have not.

10 Q. Same question for blood.

11 A. They have not.

12 Q. You are a toxicologist; right?

13 A. Right.

14 Q. You study the harmful effects of chemicals
15 on humans.

16 A. Correct.

17 Q. Did you ask Shell if they've ever studied
18 the harmful effects of benzene or gasoline on
19 humans by testing their blood or breath for
20 benzene?

21 A. No, I have not.

22 Q. Have you seen any documents from Shell
23 where they indicated any intention to share with
24 other people, downstream gasoline suppliers like
25 McNeece Brothers, folks like my client, have you

1 seen any documents in this case, or otherwise from
2 Shell, where they told those people that, hey, you
3 could check the blood and you could check the
4 breath and you could evaluate benzene exposure?

5 MR. PERRY: Object to form.

6 THE WITNESS: That information should have
7 been in the MSDS sheets.

8 BY MR. PATTON:

9 Q. You could check the blood, you could check
10 the breath?

11 A. Yeah.

12 Q. You think that information should be in an
13 MSDS?

14 A. If it is, yeah. I mean, I don't know
15 whether it is or not.

16 Q. Sir, is it your opinion as a toxicologist,
17 someone who studies the harmful effects of
18 chemicals on humans, that this little tidbit about
19 you could test the blood or breath, do you believe
20 that's something that should be in an MSDS?

21 A. Personally I believe it should be in an
22 MSDS, but the MSDS is prescribed what information
23 goes in, and I'm not sure, I haven't read an MSDS
24 in a long time other than glance at some of these.

25 Q. You glanced at some of the MSDSs in this

1 case; right?

2 A. I did.

3 Q. I'm going to hand you one of the MSDSS
4 from this case, and this came from McNeece
5 Brothers. I'll mark it as Exhibit 10.

6 (Whereupon, Exhibit 10 was marked for
7 identification.)

8 BY MR. PATTON:

9 Q. Down in the right-hand corner it says,
10 "SDT-MB001583." That's a numbering system so we
11 could keep track. Have you ever seen that MSDS
12 before?

13 A. As I said, I looked at a bunch of MSDSSs,
14 so I may have, I just glanced in there.

15 Q. Could you find in there the part that
16 talks about blood or breath?

17 A. I'm looking, if you give me a minute.

18 MR. PERRY: Take your time.

19 THE WITNESS: I haven't finished reading
20 it, but I already found something which says,
21 "Chronic exposures to vapors of a mixture
22 containing," this and that, "contaminated with
23 benzene caused decreased weight gain and blood
24 changes, lymphopenia, and neutrophilia."

25 Q. That wasn't my question.

1 A. Go ahead.

2 Q. My question was: Was there any part in
3 that MSDS that's consistent with what you believe
4 should be in there, talks about the availability to
5 check blood or breath to measure and estimate
6 benzene exposure?

7 MR. PERRY: Object to form.

8 THE WITNESS: Give me a second. I'm still
9 looking. You have two MSDSs clipped together. Are
10 they different?

11 BY MR. PATTON:

12 Q. You spent a lot of time on this case.

13 A. Uh-huh.

14 Q. It added up to 60 or \$70,000; right?

15 A. Correct.

16 Q. And you've reviewed some MSDSs?

17 A. Correct.

18 Q. This one I'm -- on the top it says,
19 "Product ingredient," and it says, "Number 4,
20 benzene," and then, "Balance," it says, "0 to
21 3 percent." Did I mark that correctly?

22 A. Correct.

23 Q. Then I'm going to turn a couple pages, let
24 me find it here. I'm going to turn to the second
25 page, and it's Chemical Number 4, that's benzene.

1 Do you see where I circled at the bottom there?

2 A. It says, "Classified by ACGIH as a
3 suspected human carcinogen A2." And the other part
4 you circled was Item Number 4, the PEL is 1 ppm and
5 the TLV/TWA is 10 ppm.

6 Q. That Product Number 4, that's benzene;
7 right? We get that from the front page.

8 A. That's correct, benzene, correct.

9 Q. And then under the TLV or TWA, those are
10 exposure limits; right?

11 A. Correct.

12 Q. Under the ACGIH, the exposure limit is 10
13 ppm, and it has two, those are asterisks; right?

14 A. Correct.

15 Q. And then when you look down, it means
16 that asterisk is classified by ACGIH. Is that
17 suspected human carcinogen?

18 A. Correct.

19 Q. I thought you told us earlier that benzene
20 was a known carcinogen dating back to the '70s.

21 A. Yeah, but this is benzene in gasoline.
22 The MSDS sheet is for gasoline not benzene.

23 Q. Hold on, sir.

24 MR. PERRY: 1998.

25 THE WITNESS: Your prerogative.

1 BY MR. PATTON:

2 Q. This is from 1998. The two asterisks
3 there are referencing -- those reference benzene,
4 they don't reference gasoline; right?

5 A. Right.

6 Q. I mean, are you disagreeing with me that
7 that reference is -- it looks to me that that
8 reference suspected human carcinogen is what Shell
9 is saying about benzene.

10 A. Could be. I can't tell from this since it
11 doesn't say. The MSDS sheet is clearly for
12 gasoline. Gasoline contains benzene. So I don't
13 know if they are alluding solely to benzene or to
14 gasoline or the benzene in gasoline. So...

15 Q. The asterisks aren't next to gasoline,
16 they're next to benzene.

17 A. I agree with you.

18 Q. This looks like a mistake.

19 MR. PERRY: Object to form.

20 THE WITNESS: I don't know if it is or
21 isn't. Benzene is a human carcinogen.

22 BY MR. PATTON:

23 Q. So would you agree with me that if these
24 asterisks are actually referring to benzene --

25 A. Right.

1 Q. -- which looks to me that they are, that
2 they would be wrong, they're calling it suspected,
3 actually it's known?

4 A. Correct.

5 Q. Do you have any opinions on the importance
6 of vapor recovery in reducing workers' exposure to
7 benzene?

8 A. I know generically that vapor recovery has
9 reduced work exposures to benzene.

10 Q. Is that a good thing?

11 A. It's not -- what do you mean by "good
12 thing"?

13 Q. Well, look, if you and I, instead of
14 sitting in a conference room today, had to go load
15 gasoline.

16 A. Right.

17 Q. Knowing what you know as a toxicologist of
18 the harmful effects of the chemicals on humans.

19 A. Right.

20 Q. Knowing from what you learned in your 60
21 or \$70,000 worth of time in this case.

22 A. Correct.

23 Q. You and I are going to go load gasoline,
24 and there's two terminals, one has vapor recovery,
25 top loading without vapor recovery, and the other

1 one does have vapor recovery. You and I are going
2 to go, one of us is going to work at one, one of us
3 is go going to work at the other; are you following
4 me?

5 A. Yes.

6 Q. Which one are you going to work at?

7 A. The one without vapor recovery.

8 Q. Without?

9 A. Yeah, as I explained before, that's the
10 substance of my paper, is that the amount of
11 benzene to which you can be exposed from working
12 with gasoline is insufficient to increase your risk
13 of leukemia.

14 Q. So hang on a second. You and I are going
15 to work as gasoline loaders like my client did.

16 A. Correct.

17 Q. We're standing there and we're deciding
18 who goes to which terminal.

19 A. Right.

20 Q. One has vapor recovery the other one has
21 no vapor recovery.

22 A. Right. I think the difference in terms of
23 exposure, in terms of harmful effects is not
24 significant. So yes, the benzene exposure would be
25 higher without vapor recovery, compared to with

1 vapor recovery, I think that's been documented in
2 the literature, but in terms of whether either
3 poses an increased risk of leukemia, the answer is
4 no, my answer is no.

5 Q. But you do agree with my question, and you
6 agree with the literature, that whomever of us
7 works at the one without vapor recovery, we're
8 going to be exposed to more benzene?

9 MR. PERRY: Object to form.

10 THE WITNESS: Potentially.

11 BY MR. PATTON:

12 Q. Potentially. You would let me work at the
13 one with vapor recovery?

14 A. Because I'm a kind person.

15 Q. Because you are a kind person, I
16 appreciate that. I appreciate that you would let
17 me work at the one without vapor recovery.

18 Now, what if we brought the videographer
19 with us today. He's the guy running the video
20 camera.

21 MR. PERRY: You said "without." He said
22 "with."

23 MR. PATTON: With vapor recovery I mean.

24 BY MR. PATTON:

25 Q. We have a videographer here in the room,

1 and he has the camera that's recording this. Let's
2 say he's going to come with us. Okay. He hasn't
3 had the opportunity to learn what you and I have
4 learned in this case. He says, "Hey, which one is
5 safer? Which one is going to expose me to less
6 vapors?" What would you tell him?

7 MR. PERRY: Object to form.

8 THE WITNESS: I would say the one with
9 vapor recovery would expose him to less vapor, but
10 I wouldn't say that it's safer.

11 BY MR. PATTON:

12 Q. Then what if he asked you, "What is a safe
13 amount of exposure for me at this, at one of these
14 loading terminals," what would you tell him?

15 A. I would say it's above 10 ppm in terms of
16 actual benzene concentrations, which you could not
17 possibly get in an acute setting, and the chronic
18 exposures that present an increased risk start at
19 about 40 ppm years.

20 Q. I'm talking about short-term. Would you
21 tell him, "Hey, you are about to go top load
22 without vapor recovery," and would you then tell
23 him, "There's no way you are going to be exposed
24 above 10 ppm"?

25 A. Correct, I would tell him that.

1 Q. You would tell him that. Go get on top
2 there, start loading trucks with gasoline. By the
3 way, guidelines have said you don't want to be
4 exposed more than 10, and I'm telling you there's
5 just no way you are going to be exposed more than
6 10.

7 A. Correct.

8 Q. How do you arrive at that conclusion?

9 A. I think there's plenty of data in the
10 literature. Again, if you look at the exposure
11 monitoring data from people at service stations,
12 refineries, loaders, you know, literally 40, 50
13 studies, there's no evidence that those exposures
14 are significant from a health risk point of view.

15 Q. So instead of agreeing with Concawe, you
16 believe that he could be exposed to 8, 9, 10 ppm of
17 benzene and he would be safe?

18 A. Concawe agrees with my opinion. You are
19 just citing a Concawe from 1993 that talks about a
20 classification of gasoline with a particular
21 benzene concentration. You're not talking about
22 Concawe saying health effects at .3 percent
23 benzene.

24 Q. Now, let's say our videographer is going
25 to top load without vapor recovery, and you've told

1 him -- would you tell him, "Hey, you are going to
2 be exposed to some benzene while you are doing
3 this"?

4 A. Yes.

5 Q. Would you tell him -- if he were to ask
6 you, "Well, how am I going to be exposed to
7 benzene," what would you tell him?

8 A. I would tell him from the vapors that he
9 might inhale.

10 Q. The vapors coming up from the tank during
11 the loading operation?

12 A. Correct.

13 Q. Shell had a guy in this case a couple days
14 ago who told me that the vapors would go down.

15 A. I can't comment on that. I don't have any
16 experience with that.

17 Q. Would you agree and would you tell our
18 videographer that the vapors would come up in his
19 breathing zone?

20 A. I would think so, yeah.

21 Q. Would you tell him that those vapors could
22 be measured for benzene content?

23 A. Yes.

24 MR. PERRY: Object to form.

25

1 BY MR. PATTON:

2 Q. Let's say you wanted to tell him
3 everything he might want to know about the dangers
4 and possible risks.

5 A. Right.

6 Q. Even though you don't think there is a
7 risk for him.

8 A. Right.

9 Q. What would you tell him; would you tell
10 him his blood could be checked for benzene
11 exposure?

12 A. Yes.

13 Q. Would you tell him his breath would be
14 checked for benzene exposure?

15 A. Right.

16 Q. Would you tell him he could use a
17 respirator to reduce his exposure?

18 A. Yeah, but I don't think it's indicated.

19 Q. The MSDS does not indicate that he would
20 need to wear a respirator; correct?

21 MR. PERRY: Object to form.

22 THE WITNESS: I haven't looked at the
23 MSDS, but I would say as a toxicologist, I don't
24 know that he needed to wear a respirator. He could
25 if he wanted to. I'd give him that option.

1 BY MR. PATTON:

2 Q. NIOSH here says that benzene airborne
3 concentration or condition of use on less than or
4 equal to 10 ppm required respirator, half-mask,
5 air-purifying respirator with organic vapor
6 cartridge.

7 A. Yeah, what I'm talking, you're reading off
8 of benzene warning, and I'm trying to tell you that
9 you can't get 10 ppm gasoline from loading benzene,
10 from loading gasoline.

11 Q. But he could get less than 10 ppm from
12 loading gasoline?

13 A. Absolutely, he would get less than 10 ppm.

14 Q. That says that he needs a respirator.

15 MR. PERRY: Misstates the record, not
16 true. Come on, Keith, it's a benzene document,
17 it's not a gasoline document.

18 THE WITNESS: Show me the same thing for
19 gasoline and I may agree with you.

20 BY MR. PATTON:

21 Q. 60 or \$70,000, that's why you're telling
22 this jury, hey, it's gasoline, no problem.

23 A. It's got nothing to do with 60 or \$70,000,
24 it's got to do with the sign.

25 MR. PERRY: Let me make a -- you say that

1 again, I'm going to shut it down. You could ask
2 the question, but don't disrespect this man. I
3 know how much your folks have been paid. Listen,
4 you could treat him with respect or we'll finish
5 now.

6 MR. PATTON: It's objection form.

7 MR. PERRY: It's objection form, and I'm
8 telling you I'm going to shut it down if you
9 disrespect this witness. You may not like his
10 opinions, but if you try to insult him or challenge
11 his integrity, we'll be done, and I'm not kidding.

12 BY MR. PATTON:

13 Q. Sir, is it your opinion that there is no
14 risk to gasoline distribution workers from benzene
15 for leukemia because they're working with gasoline?

16 A. That is correct.

17 MR. PERRY: Let's take a break when you
18 have a chance. We've been going for about an hour.

19 MR. PATTON: That's Exhibit 11, the NIOSH
20 document.

21 (Whereupon, Exhibit 11 was marked for
22 identification.)

23 MR. PATTON: Let's take a break, off the
24 record.

25 THE VIDEOGRAPHER: Off the record, at 9:49

1 a.m..

2 (Whereupon, a recess is taken.)

3 THE VIDEOGRAPHER: We're back on the
4 record at 9:55 a.m..

5 BY MR. PATTON:

6 Q. Dr. Jamall, you have in front of you
7 Exhibit 4, this is your 2008 article; right?

8 A. Correct.

9 Q. And how did this article start, what
10 prompted it?

11 A. Decades of work on gasoline-contaminated
12 sites, and cleaning up gasoline-contaminated sites
13 got me to thinking as a toxicologist where the
14 risks really were. So that's what prompted this.

15 Q. Primarily for underground storage, leaking
16 underground storage tank properties and
17 groundwater?

18 A. Right.

19 Q. This wasn't specific to gasoline and
20 benzene and the occupational gasoline loading
21 setting; right?

22 A. Right, but it applies to that.

23 Q. Going through here, "Introduction: Over
24 the past two decades there's been a growing trend
25 to evaluate and clean up properties contaminated

1 with gasoline, diesel, so on, based on their
2 potential to elicit adverse health effects."

3 A. Correct.

4 Q. Do you agree that gasoline has the
5 potential to elicit adverse health effects?

6 A. Yes, I do.

7 Q. As a toxicologist, you agree that gasoline
8 can be harmful to humans?

9 A. Correct.

10 Q. Then it says here reading on, utilize --
11 risk assessment methods by the United States
12 utilized toxicology data gathered for individual
13 constituents of the various petroleum products and
14 apply these to the mixture -- to the whole mixture.

15 A. I'm sorry, where are you on that?

16 Q. Just the next sentence starting, "Risk
17 assessment."

18 A. I'm sorry, yeah.

19 Q. It says here, "Of the many compounds
20 present in gasoline, benzene is considered a
21 surrogate for the toxicity of the gasoline mixture
22 as a whole, as it is the only recognized human
23 carcinogen in the fresh product."

24 A. Correct.

25 Q. Do you agree with that?

1 A. I agree with that. I agree with that fact
2 that that's how it's looked at. I disagree with
3 using benzene as a surrogate in gasoline and that's
4 what the rest of the paper shows.

5 Q. And --

6 A. I'm saying cleaning up or evaluating the
7 health risks from gasoline solely focusing on
8 benzene is incorrect.

9 Q. Okay, but you recognize and you cite
10 Footnotes 3 to 8 and that's the Illinois EPA,
11 Massachusetts Environmental.

12 A. Sure.

13 Q. Michigan Department of Environmental
14 Quality, Ohio Bureau.

15 A. Right.

16 Q. Texas Natural Resource Conservation
17 Commission.

18 A. Correct.

19 Q. And the US EPA.

20 A. Correct.

21 Q. All of those groups, per the citation in
22 your paper --

23 A. Correct.

24 Q. -- believe that benzene is considered a
25 surrogate for the toxicity of gasoline.

1 A. Correct.

2 Q. And you disagree with that?

3 A. Correct.

4 Q. And then reading on, the next paragraph,
5 "This study examines the rationale underlying the
6 perceived need to remediate gasoline," and then you
7 go on to discuss that you will examine published
8 information on the mechanisms of action.

9 A. Right.

10 Q. Related to the carcinogenicity of benzene
11 in gasoline?

12 A. Correct.

13 Q. Then reading on the paragraph, "The
14 present study," do you see where it says, "While
15 assessment of health risks posed," could you read
16 that sentence aloud for us?

17 A. Sure. "While assessment of the health
18 risks posed by occupational exposure to gasoline
19 during bulk handling is of interest, since it
20 provides upper-bound estimates of exposure and
21 health risks, this paper focuses on the much lower
22 benzene exposures associated with gasoline-impacted
23 properties."

24 Q. So guys who are engaged in bulk handling
25 gasoline operations, do you agree with me that that

1 includes Raul?

2 A. Yes, I agree with you.

3 Q. Those people have upper-bound estimates of
4 exposures in health risk, as compared to people who
5 just have some gasoline underground?

6 A. Correct.

7 Q. I touched on this earlier, but do you have
8 any opinions on whether top loading without vapor
9 recovery is then the upper-bound category of
10 gasoline bulk handling?

11 A. Not from the data I've seen. Subsequent
12 to based on my review of the literature, but they
13 are certainly exposed. I wouldn't disagree with
14 you there.

15 Q. What kind of gasoline bulk handling would
16 you put at the upper-bound category of benzene
17 and -- benzene exposure and health risks?

18 A. From gasoline?

19 Q. Yes, sir.

20 A. I would say workers who are probably
21 working refineries where gasoline is manufactured.

22 Q. But aren't they exposed to gasoline when
23 it's in a closed system?

24 A. It depends on what work they're doing.

25 Q. Let's go to the next page.

1 A. Okay.

2 Q. Looking down in the right-hand column, the
3 paragraph starting, "Unleaded gasoline"?

4 A. Correct.

5 Q. And reading down, "It has been suggested
6 that the four BTEX compounds," what are those?

7 A. Benzene, toluene, ethylbenzene and xylene.

8 Q. "Those account for the bulk of the
9 carcinogenic and noncarcinogenic health risks
10 caused by exposure to gasoline."

11 A. Correct.

12 Q. So once again, you respect the fact that
13 benzene via gasoline does account for the bulk of
14 the carcinogenic risk?

15 A. That's the standard practice. If you read
16 three sentences above that, it says, "In the
17 assessment and remediation of gasoline-impacted
18 properties, the standard practice of evaluating
19 health risks posed by exposures to unleaded
20 gasoline has been to use benzene, toluene,
21 ethylbenzene, xylene, abbreviated as BTEX, as
22 surrogates for exposure to the whole field."

23 Q. The standard is when you are dealing with
24 gasoline, you are also dealing with the benzene,
25 toluene, ethylbenzene, xylene?

1 A. Yes.

2 Q. Then you cite Footnote 18, which is an
3 article by my Ron Mehlman.

4 A. Correct.

5 Q. And do you know what that article is
6 about, that Mehlman article?

7 A. Yeah, he just talks about toxicology of
8 gasoline.

9 Q. Next page, 178, reading down to the last
10 two sentences of that first paragraph, starting
11 with, "Given that benzene," could you read that for
12 us?

13 A. "Given that benzene is the only human
14 carcinogen among the four BTEX compounds, in most
15 instances of gasoline-impacted soil and
16 groundwater, the benzene concentrations drive
17 calculations of health risk. Thus, benzene plays a
18 pivotal role in the development of clean-up levels
19 for gasoline (and other fuel hydrocarbons) in soil
20 and groundwater."

21 Q. Did you agree with that?

22 A. Per the guidelines, per the regulatory
23 mandate.

24 Q. And again, the regulatory mandate respects
25 the benzene risk posed through gasoline?

1 A. Correct, incorrectly.

2 Q. You would disagree with that?

3 A. Yes.

4 Q. Who else takes the position that you are
5 taking in this paper?

6 MR. PERRY: Object to form.

7 THE WITNESS: Nobody because the paper's
8 just come out. I'm sure a lot of people do, but
9 there haven't been other published papers that
10 concur or disagree with this paper.

11 BY MR. PATTON:

12 Q. Your paper disagrees with the EPA and
13 other environmental methods or approaches to this
14 situation?

15 A. To quantifying health risks from gasoline,
16 correct.

17 Q. No one has come out in support yet. I
18 recognize it's 2008, no one has come out and
19 supported your paper.

20 A. Correct.

21 MR. PERRY: Object to form.

22 MR. PATTON: That I am aware of.

23 BY MR. PATTON:

24 Q. Reading on, "The toxicological and
25 epidemiological evidence discussed here leads to

1 the conclusion," and could you read that for us?

2 A. "The toxicological and epidemiological
3 evidence discussed here leads to the conclusion
4 that chronic exposure to sufficiently high
5 concentrations of benzene alone can be
6 leukemogenic. Leukemia, and specifically AML,
7 could be induced after repeated exposures to
8 benzene in air at concentrations substantially
9 greater than eight-hour time weighted average (TWA)
10 U.S. Occupational Health and Safety Administration,
11 OSHA standard of 1 ppm, which is 3200 micrograms
12 per cubic meter, known as the permissible
13 occupational exposure limit or PEL."

14 Q. You say chronic exposure to sufficiently
15 high concentrations of benzene.

16 A. Right.

17 Q. What are the numbers that you would
18 associate with chronic exposure as far as how many
19 years or how many days; what number do you
20 associate with high concentration?

21 A. 40 ppm years.

22 Q. What is that based on?

23 A. That's based on one ppm exposure per day
24 per the OSHA limit.

25 Q. What is the source of your opinion that

1 there is this 40 ppm?

2 A. There's plenty of things. There's the US
3 EPA data. There's the European data. There's the
4 ATSDR data. There is OSHA data.

5 Q. Isn't there --

6 A. There is also clinical literature.

7 Q. Isn't there also data in literature which
8 suggests an increased risk above 20 ppm?

9 A. There is risks that's suggested in the
10 literature about one ppm, but those are not
11 consistent studies. So there are studies that have
12 not been reproduced in large numbers.

13 Q. You recognize --

14 A. They're isolated studies.

15 Q. You recognize that there are studies out
16 there showing an increased risk above one or two
17 ppm?

18 A. Yes.

19 Q. You believe Raul was exposed to how much?

20 A. About 2 ppm, less than 2 ppm.

21 Q. Are the studies valid, the ones that show
22 low dose exposure, one or two ppm years could cause
23 an increased risk, are those invalid, or what's the
24 problem with them?

25 A. They're invalid insofar as they are not

1 reproduced in the larger setting. If one to 2 ppm
2 benzene from gasoline were actually carcinogenic,
3 as the small paper suggests, then you would expect
4 to see way more acute myelogenic leukemia than you
5 do now, particularly studying it, say, over a 40 or
6 50 or 60-year period.

7 Q. What are the studies that show us that 1
8 to 2 ppm year threshold; is it the Australian Glass
9 Study, Health Watch study?

10 MR. PERRY: Object to form.

11 THE WITNESS: I don't recall the specifics
12 of the Australian Glass Study, but I know that the
13 Australian Health Watch study, which the Glass came
14 out of, the latest version doesn't show any
15 increased risk.

16 BY MR. PATTON:

17 Q. That's not my question.

18 A. Yeah.

19 Q. Sir, my question is --

20 A. So if you look at Jacobson, Kirkeleit,
21 some of the papers by Martin Smith's group out of
22 Berkeley, based on the studies in China, they
23 suggest an increased risk, but they don't document
24 an increased risk. There is a paper by Lon -- I'm
25 sorry, not Lon, Qan, Q-A-N, that suggests that.

1 Q. There is a handful of studies --

2 A. There is a handful of studies.

3 Q. -- that suggest an increased risk --

4 A. Correct.

5 Q. -- of leukemia or maybe they're specific

6 to AML, either way?

7 A. Right.

8 Q. Above 1 or 2 ppm years?

9 A. Correct, under 10 ppm years.

10 Q. Under 10 ppm years?

11 A. Correct.

12 Q. Those studies came out when, in the last

13 10 years?

14 A. Yes, in the last 10 years.

15 Q. You're saying that those are invalid

16 insofar as they have not been -- finish the

17 sentence for me.

18 A. In that they are very small numbers or

19 they are statistically insignificant, or the

20 exposures were not adequately quantified, and they

21 have not been seen in the larger studies, and I'm

22 sorry, one more thing, and they're inconsistent

23 with the animal toxicology studies for gasoline.

24 Q. There have not been further repeated

25 studies of benzene at those levels, such that you

1 believe there's support in the literature that
2 makes them valid to show one or 2 ppm years as a
3 threshold?

4 A. Correct.

5 Q. With all due respect to your paper, sir,
6 wouldn't you agree with me that there have not been
7 consistent writings or opinions by other scientists
8 echoing what you say in this paper; therefore,
9 under your logic, there is a strong argument to
10 make that your paper is invalid, unless and until
11 such additional studies and additional research
12 concurs with what you are saying?

13 MR. PERRY: Object to form.

14 THE WITNESS: You make a good point and
15 let me counter it.

16 BY MR. PATTON:

17 Q. Yes.

18 A. My paper is not based on studies that I
19 did personally. So I reviewed the literature, the
20 entire literature to see whether or not gasoline
21 exposure was associated with an increased risk of
22 cancer, and I found by and large, with few
23 exceptions which I've noted in my Table 1, that
24 there isn't any evidence.

25 Q. But my point is this, sir: The low-dose

1 studies that came out in the last 10 years or so,
2 they show one to 2 ppm year or less than 10 ppm
3 year associated with an increased risk?

4 A. Correct.

5 Q. The studies show that, we could argue and
6 quibble all day about their statistical
7 significance, the size, what have you, but your
8 criticism of that body of literature is that it has
9 not been consistently repeated?

10 A. Correct.

11 Q. And not enough authors or not enough
12 research further supports those positions?

13 A. Correct.

14 Q. And by contrast, comparing it to your
15 paper now, the paper that you're saying gasoline --
16 benzene exposure from gasoline is not carcinogenic,
17 your position in this paper has not yet been
18 repeated or echoed by other authors?

19 MR. PERRY: Object to form.

20 THE WITNESS: It actually has because if
21 you look at the entire gasoline literature, and
22 it's cited in this paper, and there are a couple of
23 papers that have come out since, but most of the
24 papers that were there have been cited in my paper
25 or discussed, and that corroborates the idea that

1 gasoline is not carcinogenic, exposure to gasoline
2 is not carcinogenic. So the fact that somebody
3 else has not written a paper saying, "I agree with
4 Dr. Jamall's paper of 2008," you know, that's
5 coming.

6 Q. But the other authors who have dealt with
7 this topic, they didn't necessarily conclude that
8 benzene exposure from gasoline wasn't carcinogenic,
9 I mean, that's not what they specifically looked at
10 in all of their studies; isn't it?

11 MR. PERRY: Object to form.

12 THE WITNESS: They certainly looked at
13 that because they looked at gasoline exposure, and
14 there is a whole separate literature on benzene
15 exposure, right.

16 BY MR. PATTON:

17 Q. Let's keep reading through your report
18 here, and on the right-hand column.

19 A. Sure. What page are we on, please?

20 Q. 178 still. The right-hand column starting
21 at the top, could you read for us, "Chronic
22 exposure"?

23 A. "Chronic exposure to benzene in the
24 workplace at peak concentration in excess of 20 to
25 25 ppm in air has been associated with leukemia in

1 general, but more specifically with AML."

2 Q. Then you cite 16, which is the ACGIH?

3 A. Correct.

4 Q. 1996 ACGIH; right?

5 A. Right.

6 Q. My question, sir, is you agree with me
7 that Steve Petty gives the opinion that Raul was
8 exposed to peak concentrations in excess of 20 to
9 25 ppm in the air. Now, whether or not you agree
10 with it we'll get to, but isn't that what Petty
11 concludes?

12 A. Petty says, "20 to 25 ppm years," not
13 "ppm."

14 Q. Doesn't he show points where there were
15 peak exposure for Mr. Zendejas?

16 A. You know, if he does, I must have missed
17 it.

18 Q. And regardless of what his numbers are,
19 you disagree and you believe there are some almost
20 25 fold lower; correct?

21 A. 20 to 25 fold lower.

22 Q. Could you describe for me the body of data
23 that you have seen from Shell which describes the
24 peak concentrations experienced by gasoline
25 distribution workers?

1 A. I haven't seen any data from Shell.

2 Q. Shell has not provided you any information
3 in forming your opinions in this case which
4 discussed the peak concentrations of benzene
5 exposure that gasoline distribution workers
6 experience?

7 A. That is correct.

8 Q. Okay.

9 A. My understanding of that literature, of
10 that body of literature is from my own research.

11 Q. Right, I understand that, and I'm just
12 clarifying.

13 A. Not from Shell.

14 Q. I'm just clarifying that Shell has not
15 provided you any information --

16 A. Correct.

17 Q. -- on what Shell has evaluated and what
18 they have found their gasoline distribution workers
19 to be exposed to?

20 A. Correct.

21 Q. Reading on here on the bottom of this --
22 well, hang on a second. The chronic exposure part
23 that you just read.

24 A. Correct.

25 Q. It says, "has been associated with

1 leukemia in general, but more specifically, with
2 AML."

3 A. Correct.

4 Q. So will you agree with me, sir, that some
5 of the literature on benzene exposure, some of it
6 deals with leukemia in a more general sense and
7 other literature deals with AML in a more specific
8 sense?

9 A. Correct.

10 Q. Correct?

11 A. Correct.

12 Q. It doesn't all deal with different sub
13 types of these myeloid diseases?

14 A. Correct.

15 Q. Some of it deals with it generally, some
16 of it deals with it specifically?

17 A. Correct.

18 Q. Then reading on here, "In both humans and
19 laboratory animals, benzene-induced bone marrow
20 depression is dose-dependent."

21 A. Correct.

22 Q. What is meant by the term "benzene-induced
23 bone marrow depression"?

24 A. It means decrease in the number of cells
25 produced by the bone marrow or in the bone marrow.

1 Q. It says dose-dependent. Do you have any
2 opinion on what dose of benzene is necessary on a
3 human being to cause bone marrow depression?

4 A. I don't have a specific opinion on that.
5 I don't remember the number.

6 Q. So you're not going to testify for us that
7 X amount of benzene exposure causes bone marrow
8 depression or cell depression in Y amount?

9 A. My recollection it's somewhere in the 10
10 ppm plus range, but I don't off the top of my head
11 right now as I sit here, I don't remember a number
12 that I would like to hang my hat on.

13 Q. Next page, at the top there you cite
14 Vigliani.

15 A. Yes.

16 Q. That's Citation Number 24. What is the
17 date on that?

18 A. 1964.

19 Q. Okay. Why do you cite that 1964 article?

20 A. My recollection is that's sort of the
21 first study that linked benzene exposure to
22 leukemia in workers.

23 Q. Was it pure benzene that they were exposed
24 to or were they exposed to benzene and other
25 solvents?

1 A. It was benzene presumably with other
2 solvents, but the benzene was the big issue in that
3 study.

4 Q. In this case?

5 A. Right.

6 Q. Raul is exposed to benzene in gasoline?

7 A. Correct.

8 Q. But benzene is the big issue; right?

9 MR. PERRY: Object to form.

10 BY MR. PATTON:

11 Q. Or do you disagree?

12 A. No, I agree with you, I have no reason to
13 disagree.

14 Q. Reading on here it cites Aksoy, and
15 then --

16 A. Studies 25 through 27.

17 Q. Those are 1974, 1976, 1985?

18 A. Correct.

19 Q. Some 35 years ago?

20 A. Correct.

21 Q. And the more recent. That shows an
22 increased risk of leukemia.

23 A. Right.

24 Q. Does it subdivide the type of leukemia?

25 A. In subsequent studies I think it does.

1 Q. Going up to --

2 A. So there's -- I don't know if it's in the
3 '85 study, but I know that there is a paper by
4 Aksoy that does subdivide some of the leukemia, but
5 generically it's leukemias, yeah.

6 Q. But going up, looking back up a few lines
7 to Vigliani and Saita, do they subdivide?

8 A. I don't think they did.

9 Q. But this study by Aksoy, it estimates or
10 deals with benzene exposure when the benzene
11 concentration was in some type of glue; is that
12 right?

13 A. Correct, to make shoes, shoe manufacturers
14 and leather workers.

15 Q. For Aksoy studies which you cite in your
16 paper, you believe they're valid; right?

17 A. Correct.

18 Q. Aksoy is dealing with benzene-containing
19 adhesives?

20 A. Right.

21 Q. It's not dealing with 100 percent benzene?

22 A. Yeah, but look at the benzene
23 concentrations in that. It's not .6 percent;
24 right?

25 Q. Well, benzene in the air.

1 A. Right.

2 Q. It doesn't -- does your paper reference
3 the benzene content of the adhesives?

4 A. No, I didn't. It wasn't relevant for the
5 paper.

6 Q. What was relevant was that there was a
7 benzene-containing adhesive that resulted in high
8 exposures in the air?

9 A. Correct, I agree.

10 Q. Reading on, that Aksoy study that you cite
11 tells us that if 73 workers exposed for an average
12 of 9.9 years --

13 A. Right.

14 Q. -- almost 70 percent of them developed
15 leukemia.

16 A. Correct. Now, those 73 workers were
17 pulled from a larger pool of about 25 or 27,000
18 workers.

19 Q. So Aksoy had guys who were exposed to
20 benzene containing adhesives, not pure benzene;
21 right?

22 A. Correct.

23 Q. They were exposed in concentrations of 150
24 to 210, or otherwise 15 to 30, which is above what
25 you believe Raul's concentrations to be; right?

1 A. Way above, yeah.

2 Q. But then they also had way high incidents
3 of leukemia; fair statement?

4 A. Right, correct.

5 Q. Then going on you mentioned the
6 contribution of percutaneous uptake. What is that?

7 A. Skin uptake, derma absorption.

8 Q. Would you agree with me, workers could be
9 exposed to benzene from using benzene-containing
10 adhesives, glues, gasoline, they could experience
11 benzene exposures through their skin?

12 A. Absolutely.

13 Q. Do you believe that Raul, based on all the
14 information you reviewed in this case, do you
15 believe Raul experienced skin exposure and skin
16 uptake from benzene?

17 A. Yes, he did.

18 Q. And then reading on the last sentence
19 there, "The problems of dose symmetry," what's
20 "dose symmetry"?

21 A. "Dose symmetry" is the quantitative number
22 of molecules that actually get inside the body or
23 in the target organ.

24 Q. It's hard to figure out the dose?

25 A. Yeah.

1 Q. That's the point of this sentence?

2 A. That's correct, I agree.

3 Q. You indicate, and I don't mean to read it
4 and be -- I don't mean to just read it, but I want
5 to be clear on my questions, sir. "The problems
6 with dose symmetry," meaning measures --

7 A. Yes.

8 Q. -- in those cohorts, meaning these studies
9 you cite?

10 A. Right.

11 Q. "Present considerable obstacles to an
12 accurate determination of the leukemogenic potency
13 of chronic benzene exposure in humans." Could you
14 finish the sentence for me?

15 A. "Although they do not detract from the
16 leukemogenic potential of benzene itself."

17 Q. In your article you respect the
18 leukemogenic potential of benzene.

19 A. Absolutely.

20 Q. The next paragraph talks about Infante's
21 study.

22 A. Right.

23 Q. He didn't provide quantitative estimates
24 in his study, but it was still valid; right?

25 A. It was valid. There were a lot of flaws

1 with the Chinese study, but his was working with
2 fairly adverse conditions with the Chinese data.
3 CAPM studies published by Yin in '87A and B,
4 published very different benzene exposure numbers
5 than the numbers that Hayes was able to --

6 Q. Let me stop you there because we'll talk
7 about Hayes.

8 A. I'm sorry.

9 Q. I want to talk about the Infante
10 paragraph. The Infante study did not provide
11 quantitative evidence in it; correct?

12 A. Correct.

13 Q. But still found an increased 10-fold risk
14 of leukemia?

15 A. Sure.

16 Q. Was that study valid?

17 A. Yes.

18 Q. Just to be clear, you agree that the
19 Infante study from 1977, which found a excess of
20 deaths from AML and monocytic leukemias -- what are
21 monocytic leukemias?

22 A. They're another form of myeloid leukemia.

23 Q. Raul had a form of myeloid leukemia?

24 A. Yes, but Raul had atypical chronic
25 myelocytic leukemia.

1 Q. But in either event, Infante in 1977 found
2 an increased risk of the type of leukemia that he
3 calls it here and no quantitative estimates were
4 provided?

5 A. Correct.

6 Q. So he didn't even get into dose?

7 A. Right.

8 Q. And it's still a valid study?

9 MR. PERRY: Object to form.

10 THE WITNESS: It's an informative study.
11 It informed several of the subsequent studies.

12 BY MR. PATTON:

13 Q. And then the Hayes study for workers
14 historically exposed to average levels of less than
15 10 ppm. Is it your opinion that Raul was exposed
16 to benzene at average levels less than 10 ppm?

17 A. Yes.

18 Q. It found a relative risk for all
19 hematological neoplasms combined, that includes --
20 what does that include, hematologic neoplasms?

21 A. It's all the leukemias and lymphocytic and
22 nonlymphocytic.

23 Q. Hayes concluded that those people had a
24 2.2, over a doubling of the risk?

25 A. Correct.

1 Q. Confidence intervals is good; right?

2 A. Yes.

3 Q. It starts above one?

4 A. Right.

5 Q. And then could you read on for us?

6 A. Sure. For acute nonlymphocytic leukemia
7 ANNL and related myelodysplastic syndromes, the RR,
8 the relative risk, was 3.2, 95 percent confidence
9 interval, 1 to 10.1.

10 Q. Three-fold risk?

11 A. Correct.

12 Q. And he differentiates between ANNL and
13 related MDS?

14 A. Correct -- no, he includes them together,
15 lumps them together. So AML, ANNL, and related myo
16 is one category. You could look at his paper.

17 Q. You testified earlier that you believe
18 ANNL --

19 A. Is the same as AML.

20 Q. Same as AML. The Hayes study, though, as
21 you put it in the last sentence there, there was
22 a -- you saw a problem with accurately assessing
23 benzene dose.

24 A. Correct.

25 Q. It's just a problem in these studies,

1 right, figuring out the dose people were exposed
2 to?

3 A. Well, in this particular study, it was
4 more than a problem of dose because the Chinese
5 had -- in fact, before they got involved with the
6 National Cancer Institute in the U.S., they
7 actually had published two papers on the same
8 cohort, and they had reported much higher benzene
9 concentrations than what Hayes was able to come up
10 with, and Rockman, who did the validation of the
11 exposure estimates for Hayes, probably at the NCI,
12 was unable to explain or did not explain the
13 discrepancy in the Chinese numbers versus their
14 numbers.

15 Q. Criticisms of the study?

16 A. Absolutely.

17 Q. Reading on towards the bottom of this
18 page, you reference a study by Rinsky.

19 A. Right.

20 Q. And you talk to primitive work practices.

21 A. Correct.

22 Q. At two plants.

23 A. Correct.

24 Q. How would you describe them as primitive
25 work practices?

1 A. These were in and around Youngstown, Ohio,
2 the Goodyear platform studies where people were
3 actually laying out sheets of plastic and basically
4 washing them or rubbing them, brushing them with
5 pure benzene, and there were hoods up above that
6 would capture the benzene after they had already
7 been exposed to it. So it was fairly significant
8 exposures.

9 Q. Why did you characterize it as a
10 "primitive work practice"?

11 A. Because that's not how we do things today.

12 Q. Do you have any opinion on whether or not
13 loading without vapor recovery is a primitive work
14 practice?

15 MR. PERRY: Object to form.

16 THE WITNESS: Not if it doesn't increase
17 risk.

18 BY MR. PATTON:

19 Q. What if loading without vapor recovery --

20 A. Right.

21 Q. -- as Raul did --

22 A. Right.

23 Q. -- is not the way Shell does things today.

24 A. Right.

25 MR. PERRY: Object to form.

1 BY MR. PATTON:

2 Q. Would that make it a primitive work
3 practice?

4 A. You know, in the U.S. we have the
5 Occupational Health and Safety Administration. You
6 have the Cal EPA, you have various state agencies,
7 and they're authorized to go in and inspect and
8 investigate any deviation from what is approved
9 practice.

10 Q. Did Shell have the authority to go into
11 McNeece Brothers and investigate and determine what
12 kind of practices they were having?

13 MR. PERRY: Object to form, misstates law.

14 THE WITNESS: That's ridiculous. You
15 know, why would Shell, as a manufacturer, have
16 authority to go into McNeece Brothers and tell them
17 how to do some things or what to do when there's
18 OSHA that's specifically created to regulate the
19 workplace to protect the worker? I personally, as
20 a regulator for the California EPA, have gone out
21 and inspected facilities to see whether the work
22 practices were consistent with the rules and
23 regulations.

24 BY MR. PATTON:

25 Q. Rules and regulations aside, if Shell

1 believed or chose to top load with vapor recovery,
2 if others are loading without vapor recovery, do
3 you think that would be a primitive work present?

4 MR. PERRY: Object to form.

5 THE WITNESS: I don't have an opinion.

6 BY MR. PATTON:

7 Q. Do you have any opinion, sir, on whether
8 or not Shell should have visited McNeece Brothers
9 and should have provided input on their loading
10 operations?

11 A. My opinion is they should not.

12 Q. Why not?

13 A. Because that is -- I just mentioned
14 there's a whole slough of regulations about who
15 regulates the workplace.

16 Q. Aside from regulating the workplace --

17 A. Right.

18 Q. -- isn't it still possible for Shell to
19 try to help its bulk customers?

20 MR. PERRY: Object to form.

21 THE WITNESS: I don't have an opinion. Of
22 course Shell could help. Yeah. I mean, how many
23 people is Shell going to help? I mean, you know,
24 there's 7-11s selling Twinkies. I saw in one of
25 the depositions you were asking about the example

1 of Twinkies not being very healthy. So is the US
2 FDA or the manufacturers of Twinkies going to every
3 7-11 regulating how many Twinkies are sold or
4 whether they're sold to obese kids? I mean,
5 there's laws in this country for that.

6 Q. Not Shell's problem?

7 A. Not Shell's problem, exactly, in my
8 opinion.

9 Q. If Shell knows that there are increased
10 exposures to benzene and Shell knows that there's
11 no safe level of exposure to benzene --

12 A. That's not true. Your premise is
13 incorrect. There is a safe level of exposure to
14 benzene, and it's well documented by the regulatory
15 agencies.

16 Q. Is it your opinion that unless someone is
17 exposed to more than 40 ppm years cumulative dose
18 of benzene, that they cannot and will not contract
19 a benzene-related leukemia?

20 MR. PERRY: Object to form.

21 THE WITNESS: I would say the risk of
22 their contracting acute myelogenous leukemia is very
23 small, some infinitesimally small risk. It's not
24 zero.

25

1 BY MR. PATTON:

2 Q. Would you agree with me that someone could
3 be exposed to less than 40 ppm years of benzene,
4 and they could still get a benzene-induced
5 leukemia? I'm not talking about risk.

6 MR. PERRY: Object to form.

7 THE WITNESS: They could, I would agree
8 with you.

9 BY MR. PATTON:

10 Q. Based on Hayes' study, which you have
11 criticisms of, he opines that people who are
12 exposed to less than 10 ppm years of benzene, they
13 could have as much as a two or three-fold risk of
14 leukemia; right?

15 A. Right, so he stated.

16 Q. Right-hand column near the top, last
17 sentence, "It should be noted that mortality from
18 leukemia is not the same as the incidents of
19 leukemia." What do you mean by that?

20 A. Most of the epidemiological studies, until
21 fairly recently and even recently, look at
22 mortality from a disease, but mortality from any
23 disease is predicated on the type of treatment you
24 got. So if Zendejas had not gotten excellent
25 treatment by Dr. Michael Carroll, he may not have

1 made it. If he was, let's say, in some third world
2 country, he probably would not have done as well.

3 Q. Let's back up a little.

4 A. Sure.

5 Q. When we were talking about dose, and your
6 opinion that it takes 40 ppm year or more, is it
7 your opinion that a person must be exposed to
8 greater than 40 ppm years of benzene before they
9 could be called a benzene-induced leukemia; is that
10 your opinion?

11 MR. PERRY: Object to form.

12 THE WITNESS: Could you repeat that
13 question, please?

14 BY MR. PATTON:

15 Q. Is it your opinion that someone must be
16 exposed to 40 or more ppm years of benzene
17 cumulative dose in order for their leukemia to be a
18 benzene-related leukemia?

19 A. Or that they be exposed -- correct, or
20 that they be exposed to concentrations of benzene,
21 you know, way above 25 ppm for an extended period
22 of time, I would say six to 10 years. I think the
23 number in the literature is 9.2 or 9.3. Say 10
24 years, round numbers, yeah.

25 Q. Is it your opinion that if someone had a

1 35 ppm year cumulative dose of benzene, that their
2 leukemia could not be called a benzene-related
3 leukemia?

4 MR. PERRY: Talking about ppm years?

5 MR. PATTON: Yes.

6 THE WITNESS: Correct, I would agree.

7 BY MR. PATTON:

8 Q. Somebody walks in with a documented 40 ppm
9 cumulative dose, you would acknowledge yes, you
10 might have a benzene-related leukemia?

11 A. The operative word there is "might."

12 Q. Okay. Somebody walks in with 35 ppm year
13 cumulative dose, your opinion is --

14 A. Unlikely.

15 Q. Unlikely. Possible?

16 A. Possible.

17 Q. Is it possible that Raul's leukemia is a
18 benzene-induced leukemia?

19 MR. PERRY: Object to form.

20 THE WITNESS: Not in my opinion.

21 BY MR. PATTON:

22 Q. However, you cite throughout this article,
23 a couple times on Page 179, about the difficulty in
24 verifying -- you used the phrase "problem of
25 accurately assessing benzene dose symmetry," you

1 mentioned "difficult to verify." You recognize
2 that the studies that show some of these increased
3 rates of leukemia are still issues with having a
4 clear analysis of cumulative dose; right?

5 A. In the older studies, correct.

6 Q. In the older studies?

7 A. Correct, I would agree.

8 Q. Have you seen any of the newer studies
9 which go to the extent of the work performed by
10 Petty to calculate dose?

11 A. In terms of modeling, there's monitoring
12 data out there. So that's published and I have a
13 whole file folder of monitoring data. So I don't
14 know why you would model when there's monitoring
15 data, unless you don't have -- I mean, we have
16 personal briefings on monitoring.

17 Q. Let's talk about that a little bit in
18 Raul's case with respect to the work that Petty
19 did.

20 A. Sure.

21 Q. Did you see any evidence in this case that
22 McNeece Brothers monitored for benzene exposures?

23 A. No.

24 Q. Did you see any evidence in this case that
25 Shell monitored at McNeece Brothers for benzene

1 exposure?

2 A. No, that's not Shell's business.

3 Q. Not Shell's business or even right to do
4 that; that's your opinion?

5 A. That's my opinion.

6 Q. Did you see any evidence in this case
7 where Shell monitored benzene exposure for workers
8 at similar terminals to the operation of McNeece
9 Brothers?

10 A. Not that I am aware of, unless those
11 terminals were owned by Shell.

12 Q. Did you see any data in this case for
13 monitoring of gasoline distribution workers?

14 A. Yes.

15 Q. What data is that?

16 A. It's in the literature there, not a Shell.

17 Q. Couple studies, Carolyn Phillips article,
18 they measured a little bit?

19 A. There's more than Carolyn Phillips, yeah.

20 Q. Do you know what the other ones are?

21 A. Not off the top of my head, but if you
22 open my exposure metabolism thing, I think it's in
23 there.

24 Q. Could you estimate how many different
25 studies or articles or pieces of information you've

1 reviewed in this case to -- which articulate
2 benzene exposure by gasoline workers?

3 A. About 10 or 15.

4 Q. Ten or 15 different articles you've seen?

5 A. Yeah.

6 Q. You brought all of those with you today?

7 A. Yeah.

8 MR. PATTON: Let's take a break and let's
9 get those articles.

10 THE VIDEOGRAPHER: This is the end of Disk
11 Number 1, Volume 1 in the deposition of Dr. Jamall.
12 We have been on the record for 1 hour and 22
13 minutes. The time is 10:35 a.m. and we're off the
14 record.

15 (Whereupon, a recess is taken.)

16 THE VIDEOGRAPHER: This is the beginning
17 of Disk Number 2, Volume 1 in the deposition of
18 Dr. Jamall. The time is 10:47 a.m. and we are back
19 on the record.

20 BY MR. PATTON:

21 Q. Dr. Jamall, during the break I marked as
22 Exhibit 12, a US EPA benzene document from your
23 file that you printed off the internet, I presume;
24 correct?

25 A. Correct.

1 (Whereupon, Exhibit 12 was marked for
2 identification.)

3 BY MR. PATTON:

4 Q. What significance does that document have
5 in your opinions today?

6 A. It doesn't have a major significance to my
7 opinions, but I like the graph at the back here
8 that talks about what concentrations of benzene
9 were associated with what effects and then what the
10 regulatory thresholds are, so it lays it out very
11 neatly.

12 Q. Before the break I wanted to talk about
13 all the data that you reviewed which talks -- which
14 shows actual monitoring of folks who are bulk
15 loading gasoline.

16 A. Right.

17 Q. And then during the break you pulled out a
18 file folder here.

19 A. Right.

20 Q. We'll go through some of these.

21 A. Okay.

22 Q. I'll mark as Exhibit 13, a study by H.J.
23 McDermott for Shell which studies service station
24 attendants' exposure to benzene and gasoline
25 vapors; is that correct?

1 A. That is correct.

2 (Whereupon, Exhibit 13 was marked for
3 identification.)

4 BY MR. PATTON:

5 Q. My client Raul Zendejas did not work at a
6 service station; correct?

7 A. Correct.

8 Q. So this isn't going to have monitoring for
9 folks who are doing bulk loading operations.

10 MR. PERRY: Object to form.

11 BY MR. PATTON:

12 Q. Or does it?

13 MR. PERRY: Gas stations.

14 MR. PATTON: It would. If he was loading
15 gas, they're basically pumping gas or working at a
16 gas station, they're being exposed to gasoline
17 vapors. There would be some correlation, wouldn't
18 be precisely the same. It would be same in kind,
19 but not in number as quantitatively perhaps.

20 BY MR. PATTON:

21 Q. Do you believe that there are lower
22 exposures to benzene via gasoline vapor in
23 operations of working like a service station
24 attendant or as compared to a bulk loading
25 operation, which one would you anticipate to have a

1 lower amount of exposure?

2 MR. PERRY: Object to form.

3 MR. PATTON: I actually don't have an
4 opinion to that.

5 BY MR. PATTON:

6 Q. So Exhibit 13 doesn't discuss bulk loading
7 operations; correct?

8 A. Correct.

9 Q. Exhibit 14 does talk about benzene
10 exposure during gasoline loading at bulk marketing
11 terminals; correct?

12 A. Correct.

13 (Whereupon, Exhibit 14 was marked for
14 identification.)

15 BY MR. PATTON:

16 Q. In that study they looked at 20 different
17 terminals in 1977.

18 A. Correct.

19 Q. If you look at the top of the front page,
20 it shows from the results of the study it could be
21 seen that the largest employee exposure to benzene
22 occurs at facilities using top loading without
23 vapor recovery; do you see that?

24 A. Correct.

25 Q. Do you have any reason to disagree with

1 that statement?

2 A. Absolutely none.

3 Q. So you agree with it?

4 A. I agree with it.

5 Q. It shows exposures during loading can
6 exceed 5 ppm for short periods?

7 A. I see that, but below 0.5 for an
8 eight-hour time weighted average and the paper is
9 from 1979, so the study was actually done in 1977.

10 Q. And this was done by industry, Gulf
11 Science and Technology Company?

12 A. Correct.

13 Q. It's a company comparable to Shell as far
14 as industry or gasoline manufacturer; right?

15 A. I would assume so, I don't know, I don't
16 know much about Gulf.

17 Q. You would agree with me that this is an
18 industry standard?

19 A. I would agree.

20 Q. It's not an independent study?

21 MR. PERRY: Object to form.

22 THE WITNESS: No, it's not. Let me add to
23 that, that anything that's published in the
24 peer-reviewed literature, it doesn't matter where
25 it's come from, it's peer reviewed.

1 BY MR. PATTON:

2 Q. Sure. If you turn to the last page or the
3 second-to-the-last page.

4 A. Right.

5 Q. Where this gentleman from Gulf in 1977
6 provides conclusions under A; could you read that
7 for us?

8 A. "Operations at facilities utilizing top
9 loading without vapor recovery result in the
10 highest benzene exposures in this study. B,
11 operations at bottom loading facilities with or
12 without vapor recoveries result in similar benzene
13 exposures."

14 Q. Sir, do you agree with me that Raul was
15 working in an operation at a facility using top
16 loading without vapor recovery?

17 A. Yes, I agree with you.

18 Q. Therefore, pursuant to this study, he
19 would work at a facility which would have the
20 highest benzene exposures; do you agree?

21 A. I would agree.

22 Q. Let's go to the next one.

23 A. Okay.

24 Q. By the way, this study, does it talk
25 about -- where in that study does it talk about

1 what the temperature was during the loading
2 operations? I'll represent to you that it doesn't.
3 Do you have any reason to disagree with me?

4 A. No, I don't.

5 Q. This article doesn't talk about
6 temperature.

7 A. Okay, I'll agree with you there. I don't
8 see it.

9 Q. It does indicate on the front page that
10 the benzene content ranged from .5 to 2.4.

11 A. Correct, I see that. This is June of '79,
12 published in June of '79, but the data is from '77.

13 Q. Does it talk about how many feet the
14 workers were from the hole where they were loading
15 into? I'll represent to you that it does not. Do
16 you have any reason to disagree with me?

17 A. No, I don't.

18 Q. This doesn't tell us distance from the
19 hole; correct?

20 A. Correct.

21 Q. It doesn't tell us the temperature?

22 A. Correct, but you can see -- correct, but
23 you can see from the photographs if those are
24 representative of what they measured, you can see
25 that they're varying distances from the hole.

1 Q. And the second page, that guy is standing
2 way off to the side.

3 A. Correct.

4 Q. Did you see the evidence in this case that
5 Raul, and others like him, would stand essentially
6 on top of the hole?

7 MR. PERRY: Object to form.

8 THE WITNESS: Only on the cover page of
9 the Petty report I think.

10 BY MR. PATTON:

11 Q. Do you have the Carolyn Phillips article?

12 A. No, I think you took it.

13 MR. PATTON: I'll mark this as Exhibit 15,
14 this is a 1978 study by Carolyn Phillips.

15 (Whereupon, Exhibit 15 was marked for
16 identification.)

17 BY MR. PATTON:

18 Q. She works for Shell in this case.

19 A. Correct.

20 Q. She gave a deposition in this case.

21 A. Correct.

22 Q. If you turn to the third page.

23 A. Is that Page 120 on the bottom?

24 Q. Yes.

25 A. Okay.

1 Q. Do you see in the middle there --
2 actually, closer to the top, "During both types of
3 loading operations," the last sentence there, "the
4 driver salesman's period of exposure to gasoline
5 vapors is basically limited to loading and
6 unloading periods and is influenced by his work
7 habits and weather conditions." Do you see that?

8 A. I'm sorry, I don't see that statement.
9 "The driver salesman's period of exposure to
10 gasoline vapor," I'm sorry, I missed you entirely.

11 Q. My point is Ms. Phillips recognizes and
12 respects that the nature of the exposure is
13 influenced by work habits and weather conditions;
14 do you have any reason to disagree with that?

15 A. Would you repeat that or point me to that
16 paragraph that you read a few lines up? Okay,
17 thank you. "Driver salesman's period of exposure
18 to gasoline vapors is basically limited to loading
19 and unloading periods and is influenced by work
20 habits and weather conditions," yeah, I would agree
21 with that, yeah, that's correct.

22 Q. Turn to the second-to-last page.

23 A. Is that -- I could find the second-to-last
24 page. Okay.

25 Q. In the Discussion Number 5, "Effective

1 vapor recovery systems can reduce exposures to
2 driver salesmen and loaders by 50 to 80 percent,
3 compared to facilities without vapor recovery"; do
4 you see that?

5 A. I do.

6 Q. Do you have any reason to disagree with
7 that?

8 A. No, I don't.

9 Q. Did you see anywhere in the MSDS where the
10 importance and the effectiveness of vapor recovery
11 and reducing exposures was discussed?

12 A. I did not see that.

13 Q. I'll represent to you that I didn't see it
14 in there either. Do you believe that the
15 effectiveness of vapor recovery is something that
16 should be conveyed to downstream bulk terminals in
17 the MSDS in the spirit of employee health?

18 MR. PERRY: Object to form.

19 THE WITNESS: I would agree with that.

20 BY MR. PATTON:

21 Q. You would agree?

22 A. I would agree.

23 Q. Just so we're clear, what Shell knows
24 about the effectiveness of vapor recovery is
25 something that should be conveyed in an MSDS?

1 MR. PERRY: Object to form.

2 THE WITNESS: I would agree with that.

3 MR. PATTON: What is the basis of
4 objection?

5 MR. PERRY: Well, he's not an expert on
6 MSDS. He's not asked to opine about Shell's MSDS
7 and there were some mutations. You showed him one
8 MSDS, and there were 10 that were produced. You
9 haven't shown him all of them.

10 BY MR. PATTON:

11 Q. Sir, have you seen any MSDS in this case
12 which discussed the effectiveness of vapor
13 recovery?

14 A. I haven't looked at all the MSDSs in
15 detail.

16 Q. The rest of your folder here -- well,
17 first of all, Exhibit 15, this study that Carolyn
18 Phillips did for Shell evaluating gasoline vapor
19 exposure during bulk handling, this was in 1977.

20 A. Correct.

21 Q. Have you seen -- actually, this was 1978.
22 Have you seen any documents in the past 30-plus
23 years in which Shell has reexamined vapor exposure
24 during bulk handling operations?

25 A. I haven't seen a Shell paper, but there is

1 a paper by Panko on another refinery that's a 2009
2 paper, I believe that's in there. If it's not --
3 it's a brand new paper, I just got it this week,
4 actually. If it's not there --

5 Q. Watch your microphone, if you could find
6 that for us.

7 A. Sure. I have a folder here that's titled,
8 labeled "2008, 2009 papers," so these are some
9 fairly recent papers, and this is the one I was
10 particularly talking to.

11 Q. Have you seen any actual monitoring data
12 from Shell which reflects the levels of benzene
13 that gasoline distribution workers are exposed to?

14 A. I don't recall if that's in any of the
15 Tsai papers, but I've quoted them and they're here.
16 So we have to look at them. It's not in there. It
17 would be in the gasoline epidemiology file.

18 I think I cited two papers from Tsai in my
19 paper. I think I may actually have a more recent
20 one from Tsai.

21 Q. Let's keep going through your paper on
22 Page 179.

23 A. Yes.

24 Q. If you look in the middle there, the
25 paragraph starting, "In a careful analysis."

1 A. Yes.

2 Q. Reading on it says, "The induction of
3 leukemia, specifically AML, is a long-term,
4 multifactorial process."

5 A. Correct.

6 Q. Do you agree with that?

7 A. Yes, all cancers are.

8 Q. That's to say somebody doesn't wake up in
9 the morning with leukemia. There are things going
10 on in the body which lead up to the ultimate
11 manifestation of the disease?

12 A. Correct.

13 Q. Do you have any opinions on whether or not
14 leukemias go through different stages?

15 A. Yes, I do.

16 Q. Could you explain that to us?

17 MR. PERRY: Object to form.

18 THE WITNESS: The acute leukemias or acute
19 myelogenic leukemias or acute CMLs, do go through a
20 fairly rapid period where the cells in the bone
21 marrow are abnormal, and because cancers are formed
22 by mutations typically in DNA, the growth of those
23 cells, the mutagenic cells of the cancers cells,
24 the progenitive cells to the cancer take over the
25 rest of the cell population, the DNA. And in the

1 acute leukemias, my understanding is that's a very
2 rapid process that unfolds over several months and
3 can be fatal very quickly as well if untreated;
4 whereas in the chronic leukemias, the cells in the
5 bone marrow mature much more to a greater extent,
6 and so manifestations take much longer to show up
7 in terms of signs and symptoms that the person
8 would experience.

9 Q. You would agree with me that the different
10 forms of leukemia essentially involve a different
11 manifestation of the cells as they're starting to
12 have problems; is that accurate?

13 MR. PERRY: Object to form.

14 THE WITNESS: Correct.

15 BY MR. PATTON:

16 Q. Reading on in your report you indicate
17 that, "While it is not possible to discern a
18 metabolized dose of benzene in the bone marrow, the
19 target organ for benzene-induced leukemia, directly
20 from the data, it follows that peak benzene
21 concentrations of minutes, hours, or even a few
22 days, are less than the threshold for DNA repair do
23 not result in any measurable leukemogenic risk."
24 Could you explain that?

25 A. In any chronic condition, in any chronic

1 disease, what you typically have is a biochemical
2 lesion, so you have some abnormality in an enzyme
3 or protein or a cell, and that deformity or that
4 abnormality, to be fairly generic about it, has to
5 exceed the repair capability or the ability of the
6 body to deal with that abnormality. Only when the
7 body's capability of dealing with that is exceeded,
8 then you wind up with manifestations of the
9 disease.

10 Q. Do you agree with me that the bone marrow
11 is the target organ for benzene-induced leukemia?

12 A. Yes.

13 Q. If you read on towards the end of this
14 page, you referenced Schnatter.

15 A. Right.

16 Q. And he concluded that the critical
17 airborne benzene concentration was likely to be
18 between 50 and 60 ppm for both AML and ANNL.

19 A. Which is the same thing, I used his
20 terminology just to be consistent.

21 Q. I need to understand, sir.

22 A. Sure.

23 Q. Is ANNL the same thing as AML?

24 A. In my opinion it is.

25 Q. What is the basis of that?

1 A. The ACS document which we also have here,
2 we could pull it out. They use ANNL as a synonym
3 for AML.

4 Q. Isn't ANNL --

5 A. Acute nonlymphocytic leukemia.

6 Q. Isn't MDS a nonlymphocytic leukemia?

7 MR. PERRY: Object to form.

8 THE WITNESS: MDS is not a leukemia, it's
9 a pre-leukemia syndrome that I believe is
10 classified as a myeloproliferative disorder.

11 BY MR. PATTON:

12 Q. Going to the last page, first full
13 paragraph near the end, "Chronic benzene exposures
14 are greater than 20 ppm are dangerous in that they
15 can increase the risk of developing leukemia." Do
16 you agree with that statement?

17 A. Yes.

18 Q. What does "chronic" mean in that context?

19 A. "Chronic" means several years.

20 Q. Several years?

21 A. Yeah.

22 Q. How many years is several?

23 A. As I said, about 10 years.

24 Q. Ten years is several?

25 A. Yes, in my opinion.

1 Q. In your opinion?

2 A. Right. You can see that referenced up
3 there that they're talking about over 20 ppm for
4 average of 6.2 years and then 13 years. So I'm
5 taking sort of a middle number out of that.

6 Q. As you read down the paragraph starting
7 "benzene hematotoxicity."

8 A. Right.

9 Q. You discuss the combined interactions in
10 metabolites.

11 A. Correct.

12 Q. And then could you read that sentence for
13 us?

14 A. Sure. "The carcinogenic risk depends on
15 the administrative dose of benzene, the absorbed
16 dose, the metabolized dose, and ultimately the
17 delivered dose of active metabolites to the bone
18 marrow hematopoietic cells."

19 Q. In this case for Raul, do you have any
20 opinion on the administrative dose of benzene?

21 A. Yes, the administered dose, the dose he
22 was exposed to was fairly low.

23 Q. What's the number?

24 A. I'm guessing it's less than five,
25 certainly less than 10, if I were to be generous

1 about it.

2 Q. You are guessing?

3 A. Yes. I mean, there's no measured numbers,
4 so I'm going by what's in gasoline, what he did,
5 I'm looking at Petty's calculations, and I'm
6 saying, okay, if I were to do Petty's calculations
7 or examine them, which I've done, then I would come
8 up with something less than 10 ppm, given that the
9 gasoline content of the benzene was around .6.

10 Q. Do you have any opinion on the absorbed
11 dose of benzene that Raul experienced?

12 A. I have no opinion on that.

13 Q. Do you have any opinion on the metabolized
14 dose of benzene that Raul experienced?

15 A. No.

16 Q. Do we all metabolize benzene at the same
17 rate?

18 A. No, we don't.

19 Q. Different people will metabolize more
20 benzene than others; is that accurate?

21 A. Possibly, and some will do less, yeah.

22 Q. What about ultimately the delivered dose
23 of active metabolites to the bone marrow
24 hematopoietic cells, do we all experience the same
25 delivered dose when exposed to the same amount of

1 benzene?

2 A. No, we don't.

3 Q. So in the loading rack example earlier,
4 when we talked about you and I going to work at
5 loading racks, let's say we were working at the
6 same loading rack. Would you agree with me that
7 you and I might experience different administered
8 doses; right?

9 A. Correct.

10 Q. You and I might experience different
11 absorbed doses?

12 A. Right.

13 Q. Our bodies will naturally metabolize the
14 doses differently; correct?

15 A. Potentially, potentially, right.

16 Q. And those doses are going to be delivered
17 to our bone marrow differently?

18 A. Correct.

19 Q. So individuals are going to respond
20 differently to the same amount of benzene in the
21 air?

22 A. Correct. You realize that that has
23 nothing to do with toxicity or carcinogenicity.

24 Q. Do you have any opinion on what level of
25 metabolized dose someone must experience to benzene

1 for it to cause leukemia?

2 A. I believe that's not known.

3 Q. It's not known?

4 A. Correct.

5 Q. So science at this point doesn't tell us

6 exactly how much benzene must be metabolized to

7 cause leukemia?

8 A. Correct.

9 Q. All science tells us is that when you look

10 at different populations at different times and you

11 estimate how much benzene they were exposed to, you

12 come up with a possible risk of leukemia for people

13 as a group?

14 A. Correct.

15 Q. But science does not tell us how

16 individuals will respond to benzene under different

17 circumstances?

18 A. Correct.

19 Q. It does not tell us how much benzene our

20 body is going to absorb compared to other

21 individuals?

22 A. Correct.

23 Q. Let's go to Page 182.

24 A. Okay.

25 Q. Second full paragraph, the U.S. Agency for

1 ATSDR.

2 A. For Toxic Substances Disease Registry,
3 yes.

4 Q. Reading down it shows, "Competitive
5 inhibition between the aromatics and benzene
6 metabolism in rodents has been described." Do you
7 have any opinions on competitive inhibition as it
8 applies to this case?

9 A. The evidence in the literature, both from
10 what I've cited here and the other studies I've
11 cited, and other studies subsequent to this paper
12 as well, is that some components of gasoline
13 decrease the metabolism of benzene in the body
14 since benzene itself is not the carcinogenic
15 compound, it's the benzene metabolites. So they
16 appear to decrease the concentration of those
17 metabolites, the other constituents of gasoline.

18 Q. Toluene is the one that's been studied;
19 right?

20 A. And others, we don't know specifically,
21 but toluene is the one most extensively studied, I
22 would agree.

23 Q. Are you expressing the opinion in this
24 case that Raul was exposed to toluene just as he
25 was exposed to benzene?

1 A. Correct.

2 Q. Are you expressing the opinion that
3 because Raul was also exposed to toluene, that that
4 would have competed with the inhibition, so to
5 speak, thereby resulting in less benzene exposure;
6 is that your opinion?

7 A. Not less benzene exposure, less creation
8 of benzene metabolites in his system.

9 Q. Let me try to say it again so we're clear.

10 A. Okay.

11 Q. Do you have an opinion in this case as to
12 whether Raul's exposure to both benzene and toluene
13 simultaneously effected the metabolism of benzene
14 into his bone marrow?

15 A. Yes.

16 Q. What is your opinion in that regard?

17 A. My opinion is that the other constituents
18 of gasoline, including toluene, would have
19 decreased the production in his body of the
20 carcinogenic metabolites.

21 Q. Do you have any opinion as to what amount
22 those other substances like toluene must also be
23 present in order for that competitive inhibition to
24 occur?

25 A. I think the studies are in the 50 ppm

1 range, at least the studies I'm familiar with.

2 There is a minimal data on that.

3 Q. Do you agree with me that the animal data
4 on that has all dealt with high concentrations?

5 MR. PERRY: Object to form.

6 THE WITNESS: Right, except with the more
7 recent Wetmore paper, which I have here, Wetmore.

8 MR. PATTON: Let's mark that as Exhibit
9 16.

10 (Whereupon, Exhibit 16 was marked for
11 identification.)

12 THE WITNESS: That's exposed to 50 ppm
13 benzene and 50 ppm benzene with 50 ppm toluene or
14 50 ppm benzene with 100 ppm toluene, but it's still
15 high doses.

16 BY MR. PATTON:

17 Q. You see near the bottom. Your testimony
18 is that co-exposure to benzene and toluene
19 decreases benzene metabolism; is that your opinion?

20 A. My opinion is that co-exposure to benzene
21 to gasoline and gasoline not just to toluene,
22 decreases the potential of potentially toxic
23 metabolites, that is correct, that is my opinion.

24 Q. At the bottom of this portion of the
25 abstract --

1 A. Right.

2 Q. -- it indicates that the doses used in
3 this study --

4 A. Right.

5 Q. -- toluene can enhance --

6 A. Right.

7 Q. -- benzene-induced clastogenic or
8 aneugenic bone marrow injury.

9 A. Right.

10 Q. So doesn't this say that toluene and
11 benzene combined will actually enhance the effect?

12 A. I know it's amazing that it says that in
13 the prose, but the tables don't bear it out. So
14 let's revisit the tables, if we may.

15 Q. Please.

16 A. So let's start with Table 3, which is on
17 Page 173 at the bottom. So here you say they're
18 looking at erythrocytes, which is red blood cells,
19 micronuclei, mass bone marrow after exposure to
20 benzene and toluene, and 50 ppm benzene causes, and
21 I'm just rounding off here, I'm not reading all the
22 standard deviations, results in 10.3 units of
23 micronuclei. Do you see that? It's in bold.
24 Third line down on Table 3.

25 Q. I see it.

1 A. When you add 50 ppm toluene, it actually
2 goes up, the number of micronuclei, to 15.2.

3 Q. What does that do if the number goes up?

4 A. It suggests a potential effect, right, of
5 toluene enhancing.

6 Q. Enhancing.

7 A. Hold on, we're not done.

8 Q. Okay.

9 A. If we may. Then when they go to the 100
10 ppm toluene with the 50 ppm benzene, you could see
11 there's no difference with the 50 ppm toluene.

12 Q. So when there is the same amount of
13 benzene and the same amount of toluene, then it
14 enhances benzene metabolism; right?

15 A. No, it doesn't enhance benzene metabolism
16 because remember what benzene metabolism is by
17 definition, is a production of the metabolites,
18 right, which are the approximate carcinogens, we
19 all agree with that? I agree. That's my opinion.
20 I am hoping that you agree with that, too. So
21 let's keep going with these tables.

22 Q. Hold on. I want to make sure I understand
23 that Table 3.

24 A. Sure.

25 Q. For the line there, second to the bottom.

1 A. Correct.

2 Q. Where it says it shows 50 ppm of benzene.

3 A. Right.

4 Q. I want to mark it so we're clear. This
5 shows 50 ppm of benzene and 50 ppm of toluene.

6 A. Right.

7 Q. So if there's the same amount of benzene
8 and toluene and benzene in the mixture, then what?

9 A. Then you get a 50 percent, roughly,
10 increase in the number of micronuclei.

11 Q. Meaning that benzene is hitting the bone
12 marrow harder?

13 A. On the micronuclei.

14 Q. Okay.

15 A. Was there any aberration in the
16 micronuclei in Raul Zendejas, I didn't see that.
17 Let's keep going with the other tables, if we may.

18 Q. But my point, sir, if there is the same
19 amount of benzene and the same amount of toluene,
20 then it's hitting the bone marrow harder; right?

21 A. It's hitting the micronuclei, it's causing
22 more micronuclei to be formed in the blood cells in
23 the bone marrow.

24 Q. It's damaging the bone marrow more?

25 A. We don't know if it's a damaging effect.

1 We will just say it's an effect, right.

2 Q. Do you understand that per the Material
3 Safety Data Sheet, there is about the same amount
4 of benzene and toluene in gasoline?

5 A. Yeah, approximate, I would take your word
6 for it.

7 Q. Where are we going next?

8 A. Table 4. So if we look at Table 4, and we
9 look at the third parameter there, CYP2E1, you
10 could see with 50 ppm, benzene and no toluene, the
11 units are 1.4 and then it's increased when you add
12 toluene; correct?

13 Q. Okay.

14 A. So CP1 -- CYP2E1 increases. If we go down
15 to the next table, just glossing over this. If you
16 look at glutathione, you will see no effect between
17 the benzene and the toluene, correct.

18 Q. When did this benzene/toluene metabolic
19 inhibition, when did these studies first start
20 coming out?

21 A. '70s and '80s. Most importantly, if you
22 look at Table 6 at urinary metabolites, you see no
23 effect of adding the toluene.

24 Q. Have you seen any -- okay.

25 Is it your testimony, Doctor, that since

1 1977, there was information out there which talks
2 about benzene metabolism in situations of -- what's
3 the term?

4 A. Animal studies.

5 Q. Animal studies or competitive inhibition,
6 let me start over.

7 Would you agree with me, Doctor, that
8 there is data and literature dating back to the
9 1970s about competitive inhibition when a person is
10 exposed to a mixture containing benzene and
11 toluene?

12 A. Correct.

13 Q. And you agree with me that dating back to
14 the 1970s, benzene is detectable in the blood, it's
15 detectable in the urine?

16 A. Metabolites are detectable in urine.

17 Q. We talked about breath earlier.

18 A. Correct.

19 Q. Remember that, we talked about blood and
20 breath a lot.

21 A. Right, sure.

22 Q. Is it your opinion and scientific fact
23 that benzene metabolites could be detected in the
24 urine?

25 A. Correct.

1 Q. That's just to say just as we could take a
2 breath sample, just as we could take a blood
3 sample, we could also take a urine sample and
4 determine the amount of benzene someone is
5 experiencing in their body at a given point in
6 time?

7 A. With a caveat that there's been a bunch of
8 studies that I haven't heard reference in the case
9 where dietary sorbic acid produces muconic acid in
10 the urine, trans, trans-Muconic acid and
11 hydroquinone, which is one of the benzene
12 metabolites. So to the extent that these earlier
13 studies have not -- we're not aware of that and
14 didn't account for that. There's some degree of
15 the urinary metabolites that may not be directly
16 back-calculated to benzene.

17 Q. You lost me there. So let me try a
18 different question. I think you lost the court
19 reporter as well.

20 A. Okay, I'll go back.

21 Q. As far as competitive inhibition goes, you
22 agree with me that benzene metabolites are
23 detectable in the urine, something we knew in the
24 '70s or earlier; correct?

25 A. '70s, yeah.

1 Q. The fact that we could detect benzene in
2 the urine of benzene-exposed workers, is that
3 something you believe should be contained in an
4 MSDS?

5 A. I don't have an opinion whether it should
6 be contained in an MSDS. I think it should be --
7 it's known by the regulatory agencies. I mean,
8 it's all in the EPA, OSHA, ATSDR documentation.

9 Q. Have you seen any information in this case
10 specific to benzene metabolism among gasoline
11 distribution workers?

12 A. I don't recall.

13 Q. This exhibit we just marked, what number
14 is it?

15 A. Sixteen.

16 Q. Sixteen?

17 A. Yeah.

18 Q. It's about benzene metabolism in rats;
19 right?

20 A. Correct.

21 Q. You've not seen any documents discussing
22 benzene metabolism in gasoline distribution workers
23 that you recall?

24 A. Actually, I do. It's Giorelli. It's in
25 the metabolism file. Do you have that there? This

1 is just leukemia broadly. It should say

2 "Metabolism." Thank you.

3 Q. Sir, I'm handing you your folder marked

4 "Benzene Gasoline Metabolism."

5 A. I'm sorry, that's right. Would you repeat

6 your question for me, please?

7 Q. We were talking about -- let me start

8 over.

9 A. Sure.

10 Q. Dr. Jamall, we were talking about

11 competitive inhibition and metabolism of benzene by

12 humans; right?

13 A. Correct.

14 Q. And my question for you is you gave the

15 opinion that competitive inhibition, when someone

16 is exposed to both benzene and toluene in a

17 mixture, it could do what; what is your opinion in

18 that regard?

19 A. It could inhibit the metabolism of

20 benzene.

21 Q. But there are also -- there is also

22 information in the studies that shows it could

23 enhance metabolism of the benzene; right?

24 A. No, in just a couple of parameters, right.

25 Q. In any event, you agree with me that

1 benzene was detectable in the urine dating back to
2 the 1970s?

3 A. Late '70s.

4 Q. And my question for you is besides rat
5 studies, could you point us to any studies that
6 examine the metabolism of -- metabolism of benzene
7 specific to gasoline workers?

8 A. Yes, I can. If I could find the paper.
9 You might want to look at that as one, I think it's
10 gas station workers, things like that, but there
11 is -- here's automobile refueling. There is
12 another very current one. I don't see it here, but
13 it's on my computer. When we take a break, I'm
14 happy to print it out for you, but this is another
15 paper along those lines.

16 Q. Have you seen any information in this case
17 which shows that Shell shared what it knew about
18 benzene metabolism and benzene in the urine with
19 downstream workers?

20 A. Other than what's published in the
21 peer-reviewed literature, no.

22 MR. PERRY: Object to form.

23 BY MR. PATTON:

24 Q. Other than --

25 A. No.

1 Q. -- journal articles. I mean, something
2 like an MSDS or otherwise where --

3 A. I just skimmed over the MSDS.

4 MR. PATTON: Let's take a short break.

5 THE VIDEOGRAPHER: Off the record at 11:26
6 a.m..

7 (Whereupon, a recess is taken.)

8 THE VIDEOGRAPHER: We're back on the
9 record at 12:06 p.m..

10 BY MR. PATTON:

11 Q. Dr. Jamall, in reviewing your CV, I saw in
12 there you talked about some of the work you've done
13 with your company Risk-Based Decisions, and some of
14 the conclusions for some of the projects say, "No
15 further action"; that's to say, you've advised your
16 clients on a given project take no further action
17 or take this action; is that a fair statement of
18 the work?

19 A. "No further action" is a regulatory term,
20 so it's not what we ask for. It's whether the
21 agency grants that based on either the site posing
22 no risk after it's been cleaned up or the cleanup
23 is not necessary.

24 Q. Based on your work in this case, have you
25 advised Shell to take any further action with

1 respect to anything in the context of warnings,
2 vapor recovery or research?

3 A. No, I have not.

4 Q. Based on your work in the case, have you
5 asked Shell to take or recommended to Shell that
6 they, in fact, take any further action in
7 researching gasoline distribution workers or
8 benzene metabolism from gasoline or any of these
9 other subjects we talked about in the studies?

10 A. No, I have not.

11 Q. Do you intend to recommend to Shell that
12 perhaps they should take further action in regards
13 to research or warnings or vapor recovery or
14 anything of that nature?

15 A. No, I don't intend to.

16 Q. Do you have any opinions in this case as
17 to whether or not McNeece Brothers did anything
18 wrong?

19 MR. PERRY: Object to form.

20 THE WITNESS: I don't have any opinions.

21 BY MR. PATTON:

22 Q. As we sit here today, do you fault McNeece
23 for anything?

24 A. No, I don't.

25 Q. Do you have any criticisms of their

1 operations?

2 A. My understanding is that their operations
3 were not dissimilar from several hundred similar
4 operations.

5 Q. Similar to other bulk terminals?

6 A. Right.

7 Q. That's to say, nothing in all the
8 information that you reviewed in this case stood
9 out to you such that you said, hey, maybe they're
10 doing something in violation of EPA, or they're
11 doing something in violation of OSHA, things of
12 that nature?

13 A. Correct.

14 Q. Do you have any opinions as to whether or
15 not McNeece Brothers should have been conducting
16 air monitoring?

17 A. I don't have any opinion on that.

18 Q. And some of the projects that you've
19 worked on on other projects, you, in fact, have
20 dealt with actual air monitoring for various
21 chemicals?

22 A. Correct.

23 Q. At some point you did, you looked at the
24 facts of that given project and you said to
25 yourself, hey, there needs to be some monitoring

1 done?

2 A. Right. That's usually a condition of the
3 permit. So when you are doing a cleanup that may
4 generate dust or vapors, then the air permit that
5 you get from the air management control district in
6 California requires you to do air monitoring.

7 Q. Do you believe that small bulk
8 terminals -- well, first of all, are they required
9 by law to do any monitoring?

10 A. I'm not aware that they are, but if they
11 are, I mean, I'm not aware of it, so I don't have
12 an opinion.

13 Q. You've had some experience with OSHA.
14 You've had some experience with NIOSH. You know
15 what a TLV is. You knew what a PEL is; correct?

16 A. Correct.

17 Q. In a lot of your projects you worked
18 precisely with those issues.

19 A. Sure, and I was a regulator, as you know.

20 Q. You were a regulator?

21 A. Absolutely. For Cal EPA I wrote some of
22 the standards for exposures.

23 Q. Are you aware of any legal requirements
24 which would require McNeece Brothers to do air
25 monitoring?

1 A. I'm not aware of.

2 Q. As a toxicologist, do you believe that
3 McNeece Brothers should have been conducting air
4 monitoring?

5 A. I don't think so.

6 Q. What would need to happen in your opinion
7 to trigger a small bulk terminal like McNeece
8 Brothers to go ahead and do some air monitoring?

9 A. Either there was some sort of OSHA
10 violation that was, you know, recorded, noted, or
11 that they had an extra number of cases of AML.

12 Q. The fact that this single AML arose from
13 that plant, is this enough in your mind that you
14 think McNeece Brothers should do some monitoring or
15 do you have an opinion?

16 MR. PERRY: Object to form.

17 THE WITNESS: You said AML. This was not
18 AML. This was atypical CML.

19 BY MR. PATTON:

20 Q. What disease does he have as we sit here
21 today?

22 A. He has a blast crisis. It's not AML. I
23 realize that Carroll called it that, but I saw Dr.
24 Gore's deposition where he said he would call it a
25 blast crisis. I'm not a hematologist oncologist,

1 you could call it either one.

2 Q. Did you see what Shell's expert,
3 Dr. Natelson called it?

4 A. I think he called it a blast crisis,
5 that's what I recall.

6 Q. He said it was in the same group as AML;
7 right?

8 A. Yeah, I would agree.

9 Q. You agree that Raul has the same disease
10 that's in the same group as AML?

11 A. It's in the same group in terms of being a
12 myeloid disease, yes, but it's a separate entity.
13 So the only evidence for -- there's no evidence for
14 chemically-induced CML that I am aware of other
15 than radiation, which is fairly clearcut with
16 regard to CML broadly.

17 Q. You had a citation to a study by Mehlman
18 in your paper; correct?

19 A. Right.

20 Q. Have you seen the study by Mehlman or the
21 review article by Mehlman discussing the
22 relationship between benzene and CML?

23 A. Yeah, but that was way before Mehlman had
24 looked at the literature. That was a very early
25 paper, and there's so many papers since then.

1 Q. Going back to my original question. Do
2 you have an opinion on what would need to happen in
3 order for McNeece Brothers such that they should do
4 some air monitoring?

5 A. As I said, if they had an OSHA violation,
6 there's some documentation that they were in
7 violation of the laws regarding employee exposures,
8 then I'm sure those laws would cause them to
9 regulate, I'm not an industrial hygienist, so I
10 don't typically deal with that kind of issue.

11 Q. But you used to work for Cal OSHA; right?

12 A. No, I used to work for Cal EPA, Department
13 of Toxic Substances Control.

14 Q. Are there any government entities out
15 there, to your knowledge, whose job it is to
16 randomly go out and perform air monitoring at sites
17 such as McNeece Brothers?

18 A. In California, it would be Cal OSHA;
19 otherwise, it would be OSHA is my understanding,
20 and I'm aware of such inspections having been
21 conducted in facilities, independently unannounced
22 inspections.

23 Q. Do you believe that industrial hygiene
24 monitoring is helpful to evaluate benzene exposure
25 among gasoline workers?

1 A. Yes, and there is a fair bit of it that's
2 been done.

3 Q. Okay. Did you see anything in the
4 Material Safety Data Sheet, or otherwise in any of
5 the evidence in this case, in which Shell
6 recommended to small bulk terminals that they could
7 and should conduct industrial hygiene monitoring?

8 A. I didn't see any specific thing about
9 industrial hygiene monitoring. I don't remember
10 that anyway.

11 Q. Did you read the deposition of Robert
12 McNeece?

13 A. I did.

14 Q. Did you see where he testified as to not
15 conducting any monitoring, I don't believe he was
16 familiar with the TLV or a PEL, and some of his
17 other lack of knowledge, so to speak, as compared
18 to what the Shell witnesses know about these
19 topics, did you see some of that testimony
20 generally?

21 A. Yes, I did.

22 Q. Do you have any criticisms of Robert
23 McNeece as far as his ability to run his operation?

24 A. I think it's true for a lot of people in
25 his position. He's not unique.

1 Q. You agree with me that small terminal
2 operators, folks like the McNeece family business
3 here, they just don't know as much information
4 about gasoline and vapor recovery and TLVs and
5 monitoring and all of those matters, they don't
6 know as much as Shell does; do you agree?

7 MR. PERRY: Object to form.

8 THE WITNESS: I would agree.

9 BY MR. PATTON:

10 Q. Do you believe that Shell has any
11 responsibility to share Shell's knowledge at a
12 practical level about some of those issues?

13 Aside from an MSDS, do you believe that
14 Shell has any type of responsibility to share that
15 type of information with folks like McNeece?

16 MR. PERRY: Object to form.

17 THE WITNESS: I don't.

18 BY MR. PATTON:

19 Q. You don't have any opinions or you don't
20 have a responsibility?

21 A. I don't think they have a responsibility.

22 Q. Who does?

23 A. OSHA.

24 Q. OSHA?

25 A. And the state agencies that correspond to

1 OSHA. So all states have their environmental
2 health department or environmental resources
3 department.

4 Q. You believe that state and local
5 government agencies?

6 A. And federal. Federal, state, and local.

7 Q. Let's be clear.

8 A. Okay.

9 Q. Dr. Jamall, is it your opinion that state,
10 federal, and local agencies have the responsibility
11 to share the information what they know about the
12 dangers of let's say gasoline loading operations,
13 they have the responsibility to share that with
14 folks like McNeece?

15 A. They do.

16 Q. They do. Okay. You saw the testimony
17 which shows the level of knowledge by Robert
18 McNeece as far as what he knew about some of these
19 issues; right?

20 A. Correct.

21 Q. You don't have any criticisms of his level
22 of knowledge; correct?

23 A. Well, like I said, it's not atypical of
24 people in his position.

25 Q. Did you see any information in this case

1 where OSHA or other federal or state or local
2 agencies shared information with Bob McNeece such
3 that he would be more sophisticated, so to speak?

4 A. I haven't seen that.

5 Q. So how would Robert McNeece go about
6 knowing some of these things we've been talking
7 about, vapor recovery, blood and urine tests
8 available, benzene exposure levels, PELs, TLVs; how
9 would you expect someone like him to become
10 educated on these subjects?

11 A. My understanding is that not speaking
12 specifically to McNeece, but all petroleum
13 industry, that small businesses in all kinds of
14 industries have access to a trade association, and
15 they typically get a trade association magazine or
16 bulletins or something like that that apprise them
17 of what's going on and what they ought to know.

18 Q. Did you see any evidence like to that end
19 in this case?

20 A. I did not.

21 Q. Do you have any criticisms of the way Raul
22 Zendejas performed his job?

23 A. I think he was maybe a little cavalier,
24 but I don't know that I have a criticism of him
25 because how would he know?

1 Q. How was he cavalier?

2 A. Well, he allegedly -- according to his
3 testimony, he washed his hands in gasoline and that
4 obviously wasn't a very good idea.

5 Q. What other criticisms do you have?

6 A. That's basically it. I mean, I think
7 other than that, I think he did -- from what I
8 read, you know, I haven't met the man, he seemed to
9 have done everything right.

10 Q. So aside from washing his hands in
11 gasoline, you believe Raul did everything all
12 right?

13 MR. PERRY: Object to form.

14 THE WITNESS: Generally speaking, yeah.

15 BY MR. PATTON:

16 Q. Any other criticisms of the way Raul did
17 his job?

18 A. I have no criticism of the way Raul did
19 his job.

20 Q. You said he didn't know a couple -- about
21 a minute ago. What did you mean by that?

22 A. Well, I didn't see from his testimony that
23 he was acutely aware at the time that he was doing
24 this that he should or shouldn't do this, although
25 he was offered gloves and he chose -- I think his

1 testimony was that he chose not to use them. I
2 believe somebody else, I can't remember the name,
3 with an H or TH or something, was there, they said
4 they used gloves.

5 Q. Is there anything you think Shell should
6 have done differently from a product stewardship
7 standpoint in warning McNeece and workers like Raul
8 about the dangers of gasoline and benzene?

9 A. No, I don't think so. I think they did
10 that in the MSDS sheets.

11 Q. Is there evidence in the scientific
12 literature which defines a threshold level of
13 benzene that will not cause someone's leukemia when
14 you consider the factor of individual
15 susceptibility?

16 MR. PERRY: Object to form.

17 THE WITNESS: Yeah, I believe there is the
18 Duarte study where Rushton is a co-author, that
19 talks about people exposed to benzene in the
20 general environment, the population at large,
21 children, so on. The regulatory thresholds that
22 have been established by the US EPA, OSHA, the 1
23 ppm level we've talked about, the ACGIH TWA, do
24 take into account sensitive populations. So I
25 believe that the standards incorporate and

1 consider, and having written some of those
2 standards, I can attest to it sort of from personal
3 experience, that they do account for susceptible
4 populations.

5 Q. Have you written any standards specific to
6 benzene?

7 A. I have not.

8 Q. If someone is exposed to let's say one or
9 2 ppm years of benzene, is it your opinion --
10 cumulative dose, is it your opinion that it is
11 simply not possible that that is a benzene-induced
12 leukemia?

13 A. Pretty much. I mean, never say never. I
14 mean, you could be hit by lightning right now. But
15 it's far too remote and outside the realm of the
16 scientific evidence we have that that would be the
17 case. So it may be a coincidence that somebody
18 exposed to one or two ppm gets AML, but it doesn't
19 necessarily mean that it caused it.

20 Q. Do you believe benzene played any role in
21 Raul's leukemia?

22 A. No.

23 Q. What do you think did play a role in
24 Raul's leukemia?

25 A. Misfortune.

1 Q. Misfortune?

2 A. Yeah, I mean so many people get leukemia;
3 right? All of them don't get it because they did
4 something, any kind of cancer, maybe with the
5 exception of mesothelioma. The vast majority of
6 AMLs, 90 percent or 98 percent, 99 percent, or
7 whatever the number is, 90 plus percent are not --
8 are idiopathic.

9 Q. So the majority of leukemias you just
10 don't know the cause?

11 A. That's right.

12 Q. And the majority of the leukemias are not
13 atypical CML; correct?

14 A. No, atypical CML has incident rates in the
15 U.S. from 2001 to 2006, if I'm remembering right,
16 of around 1.9, maybe 2, whereas AML, for example,
17 is 4.3 per hundred thousand population.

18 Q. Have you done exposure assessment in this
19 case?

20 A. No, I have not.

21 Q. Have you seen any information in this
22 case, aside from Steve Petty, where someone did an
23 exposure assessment to model and estimate the
24 amount of benzene Raul was exposed to?

25 A. I have not seen that.

1 Q. As far as studies go, some of the
2 epidemiological literature, some of what we talked
3 about to today, some of what's referenced in your
4 paper, as far as those go, would you agree with me
5 that much of the literature deals with leukemias
6 generally; correct?

7 MR. PERRY: Object to form.

8 THE WITNESS: Much of the older literature
9 deals with leukemia generally, but then gets
10 specific along the way where it bores out the AMLs
11 and in some cases even the CMLs.

12 BY MR. PATTON:

13 Q. When a study is performed it might find
14 someone in the study who has MDS; fair statement?

15 A. Right.

16 Q. That person could ultimately progress to
17 AML; correct?

18 A. Right.

19 Q. And do you know in any of these studies
20 where it accounts for that enhancement or that
21 development from MDS to AML?

22 A. I haven't seen a specific study which has
23 been done, but I'm sure the updates, for example,
24 the Australian Health Watch, the next one will
25 probably pick it up.

1 Q. For example, if Raul Zendejas were to be
2 placed in an epidemiological study, as we sit here
3 today --

4 A. Right.

5 Q. -- what do you believe his disease would
6 be classified as?

7 A. Atypical CML.

8 Q. Could it be classified as AML?

9 A. Not in my opinion, but I'm not a
10 physician. If I could elaborate on that for one
11 minute.

12 Q. Sure.

13 A. If somebody got diagnosed with liver
14 cancer and they wound up -- in three or four years
15 the cancer metastasized and they wound up with
16 breast cancer or brain cancer or bone cancer, the
17 cause of their disease is not the brain cancer or
18 the bone cancer, it's the liver cancer which
19 metastasized, and we have the sophistication
20 clinically to establish those things.

21 Q. Benzene effects the bone marrow; right?

22 A. Correct.

23 Q. Atypical CML is a bone marrow disease;
24 right?

25 A. Atypical CML bone marrow is a bone marrow

1 disease, correct.

2 Q. Have you seen any information in the
3 evidence in this case by Shell suggesting that
4 Shell take action to reduce benzene exposure and/or
5 leukemia risk among downstream gasoline
6 distribution workers?

7 MR. PERRY: Object to form.

8 THE WITNESS: At Shell facilities or
9 independent?

10 BY MR. PATTON:

11 Q. Let me ask it in a different way.
12 Dr. Jamall, have you seen any evidence in this case
13 which shows that Shell suggested that a downstream
14 gasoline distribution facility or worker take
15 action to reduce benzene exposure?

16 A. I have not seen that.

17 Q. Have you seen any evidence in this case
18 showing where Shell suggested a downstream bulk
19 terminal or gasoline worker, that they take certain
20 action to reduce their risk of leukemia?

21 A. I have not seen that.

22 Q. Do you have any criticisms of Dr. Gore's
23 opinions in this case?

24 A. My only criticism was that he doesn't
25 understand the dose-response nature of

1 carcinogenesis and that speaks only to the chemical
2 component of the stuff. I'm sure he's a super
3 physician. When he said that there's no safe dose
4 for a chemical that causes cancer, I think that the
5 evidence does not support that view, even for
6 radiation.

7 Q. Any other criticisms of his opinions?

8 A. That's basically it.

9 Q. What about Dr. Infante, any criticisms of
10 his opinions in this case?

11 A. I don't recall all his specific opinions.

12 Q. As we --

13 A. I did read his deposition, but I don't
14 remember all the nuances.

15 Q. As we sit here, do any of his opinions
16 stand out to you that you are critical of?

17 A. I couldn't say, you would have to get very
18 specific for me to answer that. I have some extra
19 copies of those, so I would appreciate having them
20 in front of me when you are questioning me on that.

21 MR. PATTON: I'll mark this next group of
22 exhibits as Exhibit 17.

23 BY MR. PATTON:

24 Q. These are your notes on Steve Petty's
25 work; right?

1 A. Correct.

2 (Whereupon, Exhibit 17 was marked for
3 identification.)

4 BY MR. PATTON:

5 Q. This is two -- three regular-sized sheets
6 of paper and then two large pieces of paper. Could
7 you explain to us what you are saying in those
8 documents and how it effects your opinions in this
9 case?

10 A. Sure. These are actually copies --
11 they're basically the same thing. What I did is I
12 went over Petty's modeling effort and I summarized
13 sort of the major criticisms that I felt would have
14 a big impact on the outcome on his dose
15 calculations. So I've listed those.

16 So, for example, Number 1 is that the
17 benzene content of gasolines handled in 2001
18 through 2006 is lower than assumed. He assumed
19 2.4 percent. On the right-hand side of this page I
20 have what the effect was. So it overestimated it
21 by about four, considering that the numbers were
22 around .6.

23 He assumed random speed, wind speed when
24 Zendejas, when Mr. Zendejas was working outdoors
25 top loading, as you were saying, and other things,

1 of 100 feet per minute, that's about a mile per
2 hour, and if you look at the recorded --

3 Q. One mile per hour?

4 A. Roughly.

5 Q. Steve Petty estimated the wind speed where
6 Raul was working one mile per hour?

7 A. Roughly.

8 Q. Okay.

9 A. 5,000 feet make a mile, 5,280. So it's a
10 tad over a mile per hour. We could go to two
11 decimal places.

12 Q. You are going to lose me on the math.

13 A. So the actual data -- and I brought it
14 with me here -- for Yuma, Arizona is on the order
15 of eight miles per hour, and somewhere maybe in his
16 report or in the deposition, Petty's deposition,
17 Mr. Petty's deposition, he said that yeah, but that
18 was at a certain height, and I've actually provided
19 you in this spreadsheet the calculation for how you
20 could correct for height on the data.

21 So based on this calculation, we come up
22 with about six miles per hour average wind speed
23 outside. So that would reduce Petty's exposure
24 outdoors by a factor of six.

25 Q. Have you seen any information in the MSDS

1 which talks about the importance of wind speed
2 effecting exposure to benzene from gasoline loading
3 operations?

4 A. Why would I expect to see that in the MSDS
5 sheet?

6 Q. Well, you're saying that you are critical
7 of Steve Petty's estimates.

8 A. Right.

9 Q. You're saying that the number of exposure
10 is different.

11 A. Right.

12 Q. Is it your opinion that wind speed will
13 effect the benzene exposure numbers?

14 A. Yeah.

15 Q. Okay. Lower wind means more exposure?

16 A. Right, more potential for exposure.

17 Q. The lower the wind speed the more
18 potential for exposure because the vapors are going
19 to stay in the breathing zone longer; correct?

20 A. Right, I agree.

21 Q. The higher the wind --

22 A. The more quickly.

23 Q. -- the more quickly the vapors will move
24 away?

25 A. Correct.

1 Q. Did you see anything in the Material
2 Safety Data Sheet which conveys that to folks like
3 Robert McNeece so that he would know the importance
4 of wind as it effects potential benzene exposure by
5 his workers?

6 A. I haven't seen anything in the MSDS sheet,
7 but I don't think, frankly, that's got anything to
8 do with the MSDS sheet. That's sort of almost
9 commonsensical. You could take any kind of vapor,
10 take a perfume, and if the Court Reporter here had
11 on heavy perfume or I had on after-cologne,
12 aftershave, it would have a much greater impact on
13 all of you than if we were standing outside in the
14 parking lot.

15 My third comment, critique, was that the
16 results, it turns out, are extremely sensitive in
17 his new field model to a factor called RH, and
18 that's the distance from the hatch, and he assumed
19 that to be two feet. Looking at the literature, I
20 felt -- and some of the photographs, I felt that,
21 you know, to be fixed at two feet for every single
22 thing he did was kind of an overestimation, and I
23 chose a range of one to six feet just as
24 approximation, and that changes things by one
25 quarter to higher than what he estimated or nine

1 times lower, depending on whether it was one foot
2 or six feet.

3 Q. Instead of just making a criticism of
4 Petty's chosen wind speed and what Petty decided to
5 opine on as far as his distance and then draw a
6 larger conclusion to it, why didn't you just redo
7 the math yourself?

8 A. Because I didn't have the time, frankly,
9 and I wasn't asked to do that.

10 Q. You got Petty's report a year ago; right?

11 A. Yeah, but Petty just changed his model.

12 Q. He didn't change his model?

13 A. He changed some of the assumptions in his
14 model. So yeah, I mean, as I said, I have two
15 answers for you. One, I didn't do it and two, I
16 wasn't asked to do it.

17 Q. But I mean to be fair to Petty, in
18 preparing for his deposition, he read his report.
19 You saw his deposition; right?

20 A. Yes, I did.

21 Q. You testified that he read his report, saw
22 a couple things that might be inaccurate, and he
23 wanted to revise those and make sure that he was
24 accurate; right?

25 A. Yeah. Sorry.

1 Q. But before his deposition you had his
2 report over a year ago?

3 A. Yeah.

4 Q. At any point did you ask Shell, "Hey,
5 would you like me to perform mathematical
6 modeling"; did you ask Shell that question?

7 A. I didn't ask Shell that question.

8 Q. Did Shell ever tell you that they wanted
9 you to perform a mathematical model?

10 A. No, they did not.

11 Q. Did you ever ask Shell if they had
12 somebody else doing the modeling?

13 A. I didn't ask that.

14 Q. Did Shell ever tell you that he had any
15 indication or intent for someone else to do the
16 modeling?

17 A. No, they did not.

18 Q. Do you think you should have done the
19 modeling?

20 MR. PERRY: Object to form.

21 THE WITNESS: I don't think it's necessary
22 to do the modeling. I think what we have to
23 understand and appreciate, and perhaps even agree
24 on, is that modeling is a simplification of the
25 actual exposure. I mean, the ideal case is to have

1 breathing zone monitoring and that way you know the
2 numbers over time.

3 So when you do modeling, and I've done
4 modeling, then you take assumptions that not only
5 fit a particular agenda, but you look at the signs
6 and see what's out there that's real that may or
7 may not apply. You get a range of exposures. So
8 what got me first when I read Petty's model a year
9 ago, was that everything was very dogmatic, there
10 was no range considered.

11 BY MR. PATTON:

12 Q. He used an average at points instead of a
13 range?

14 A. Right, but how he derived that average was
15 unclear when there was data in the California
16 literature, the US EPA literature and the benzene
17 composition. So instead of 2.4, he could have
18 picked 1.2. I wouldn't have faulted him for that.

19 Q. If the benzene content wasn't 2.4 and it
20 wasn't four, why doesn't the MSDS indicate that it
21 was four?

22 MR. PERRY: It could be zero.

23 THE WITNESS: It could be zero. So the
24 part that Petty didn't get from the MSDS, and I
25 would suggest that a lot of people didn't get as I

1 read through the depositions, is that when you take
2 a range and you give the low end of the range and
3 the high end of the range, there is no way to
4 figure out what percent of the time the product
5 contained more of the low end or more of the high
6 end. So you can't compute an average. For an
7 average you need one, two, three, four, five, add
8 it up, divide by five. So if you didn't have
9 individual datum for a thousand benzene
10 calculations or measurements, then you can't just
11 dream up a number that you think is the midpoint
12 and use that because you don't know, because, in
13 fact, it turns out the CARB regulations back in
14 1998 said you can't manufacture or sell gasoline
15 over 1.2 percent, and the average concentrations
16 were limited by regulation at 0.8. I'm talking
17 about before 2000. I have the documentation.

18 BY MR. PATTON:

19 Q. Do you believe it's possible for the
20 gasoline to have zero benzene in it?

21 A. No, I didn't say it should be zero.

22 Q. Could it be zero?

23 A. No, I think if it's zero, somebody faked
24 it.

25 Q. There has to be some benzene in the

1 gasoline?

2 A. Yeah, sure.

3 Q. All right. What other criticisms of
4 Petty's opinion do you have?

5 A. The dominant exposure data used was
6 using -- he cited three papers, and we should pull
7 out Petty's reports so I could show you the exact
8 table.

9 Q. Let's take your microphone off as we do
10 that.

11 A. Sure. Excuse me a second. Okay. So
12 Table 7-1 is titled, "Benzene Dermal Flux Data for
13 Various Liquids in Benzene Levels Within These
14 Liquids."

15 Q. Before you criticize that, do you have any
16 independent opinions as to the level of benzene
17 that Raul experienced or was exposed to dermally in
18 his work?

19 A. Whatever was in gasoline, right, which is
20 .6 we talked about based on the Shell data, and if
21 you want to take a broader number, you could take
22 .8.

23 Q. You agree that Raul was dermally exposed
24 to gasolene?

25 A. Absolutely.

1 Q. Do you have any opinion as to the amount,
2 the cumulative dose of exposure to benzene that he
3 experienced dermally; do you have any
4 independent --

5 A. We could estimate it, yeah. No, I don't
6 have any independent --

7 Q. You didn't go through and calculate that
8 out yourself?

9 A. No, I didn't.

10 Q. Instead you are going to criticize Petty
11 for it?

12 A. Yeah.

13 Q. Go ahead.

14 A. There are two studies here that have --
15 use 100 percent benzene. One got a flux of 0.4 and
16 the other got a flux of hundred. I'm sorry, used
17 100 percent and got a flux of .19. If you round it
18 off to .2, that's half. The third one, which is
19 5 percent benzene, got a flux of .062. So Petty
20 then uses that to create this figure, Figure 7-1,
21 and this figure is just nonsense mathematically.
22 So what I did for you here is I analyzed what those
23 various -- what the shape of this curve could be
24 given those three data.

25 As you can see, there could be any one of

1 different shapes, and the consequences of that are
2 huge in terms of the subsequent use of this data to
3 calculate the benzene exposure.

4 Q. Have you seen any evidence in this case or
5 otherwise where Shell examined dermal flux or
6 exposure to benzene dermally?

7 A. I have not.

8 Q. Did you ask Shell if they've done any
9 evaluations or studies on the amount of benzene
10 someone takes into their body from dermal exposure
11 while using gasoline?

12 A. No, I did not.

13 Q. Continue.

14 A. So going back to my summary, it would
15 appear that that was sort of made up, that
16 calculation. It effected benzene exposure just
17 generically. So if you use sort of the midpoint of
18 those curves, just I've given you the calculations
19 there and all the equations, to skip the math.

20 If you go to the bottom of Table 7-5,
21 Mr. Petty estimates dermal exposure for
22 Mr. Zendejas of 6.8 ppm years, and so if you just
23 take the midpoint of that, not take the lowest end
24 or, you know, try to slide it one way or the other,
25 just play it out straight, you get a number that's

1 probably in the half to 1 ppm range, just for the
2 dermal exposure only and that's with the
3 2.4 percent benzene and all that. It's about 2
4 ppm.

5 Q. I thought you said we just can't take the
6 half of a number, that's what you criticized Petty
7 of doing?

8 A. I'm not taking the half of the number.
9 I'm taking the midpoint. I'm saying that based on
10 Figure 7-1, you cannot come up with a number to use
11 at 2.4 percent benzene the way he did it.

12 Q. Okay, what other criticisms do you have?

13 A. The other criticisms are minor. I think
14 those are the major ones. Let me just refresh my
15 memory here. If you look at Table 6-4, look at
16 Line 1 and 8AP, please.

17 Q. Okay.

18 A. Those look like exactly the same
19 operations, but they come up with different
20 numbers, and I don't know if that's a major or
21 minor issue or there's a rational explanation for
22 it. I just couldn't figure it out.

23 Q. I interpret it as loading customer tanks
24 as one thing. Loading his tank is another thing,
25 and dispensing from truck is another thing, but

1 either way.

2 A. I found a discrepancy between because the
3 fill gas rate in the first column is 71.4, it's the
4 same for both. The G average flux is 3168, and
5 here it becomes 3989, and then, of course, the end
6 results wind up different for that.

7 Q. Do you have any opinion on the effect of
8 the temperatures in Yuma, Arizona as they drive
9 Petty's numbers?

10 A. The temperatures in the summertime are
11 higher, so you would expect more volatilization.

12 Q. More benzene in the air?

13 A. Well, more vapor in the air. Obviously
14 benzene is part of the vapor, but the question is
15 because benzene is in the light chain, right, it's
16 a six carbon compound, and it's highly volatile, so
17 the benzene would go off much faster, I would
18 expect, at higher temperatures than everything else
19 that you can still inhale vapor.

20 Q. Let me ask the question this way: If you
21 and I are going to go top load without vapor
22 recovery, all other conditions being equal.

23 A. Right.

24 Q. I'm doing it in Yuma, Arizona in the
25 summer when it's 100 degrees.

1 A. Right.

2 Q. You are doing it in Minnesota at some time
3 of year when it's 30 degrees.

4 A. Right.

5 Q. All other things being equal, who is
6 exposed to more benzene?

7 A. I don't have a definitive answer to that,
8 but I would say it's not that clearcut on the
9 temperature issue necessarily, and I'll explain
10 why. It's true when you have high temperature you
11 have high volatility of any volatile compound,
12 that's why it's called a "volatile compound," but
13 at low temperatures you have less air movement and
14 there's more humidity in the air. So you may
15 actually wind up getting a bigger dose of the
16 benzene specifically in that vapor.

17 Q. Any literature?

18 A. There is no literature, I'm not opining on
19 that.

20 Q. You are just kind of thinking out loud?

21 A. I'm thinking out loud, correct.

22 Q. Do you have any criticisms of the
23 methodology that Infante used in arriving at his
24 opinions?

25 MR. PERRY: Object to form.

1 THE WITNESS: What do you mean by
2 methodologies?

3 BY MR. PATTON:

4 Q. Did you read his deposition?

5 A. I did read his deposition, but I read it
6 several weeks ago, so I don't remember.

7 Q. He reviewed certain studies, and he
8 arrived at his opinions, and he talked about what
9 all he did in arriving at his opinions. My
10 question for you is, as we sit here today, do you
11 have any criticisms of his methodology in forming
12 his opinions?

13 MR. PERRY: Object to form.

14 THE WITNESS: I don't recall the details.

15 BY MR. PATTON:

16 Q. You don't have any criticisms?

17 MR. PERRY: Object to form.

18 THE WITNESS: I don't recall his opinion
19 specifically.

20 BY MR. PATTON:

21 Q. So you don't have an opinion on it?

22 A. I don't have an opinion as I sit here
23 because I don't recall. If I go back and look at
24 it, or you ask me, "What do you think about this,"
25 I'm happy to comment on it, it will refresh my

1 mind. After a while all these blur in your head.

2 Q. Tell me about it. Same question for Dr.
3 Gore, when you reviewed his deposition and his
4 testimony in this case, do you have any criticisms
5 in the methods he used in arriving at his
6 conclusions?

7 A. Other than the fact that he said that
8 there's no safe threshold, there's no threshold for
9 a carcinogen, most of his other stuff is clinical,
10 and I don't feel I'm qualified to comment on that.

11 Q. I want to make sure we have this Petty
12 exhibit complete.

13 A. Those are the only three things.

14 Q. Three pages?

15 A. Yeah.

16 Q. Hang on. You got another one there.

17 A. You put a stamp on that. This is the same
18 as this large one, I just have multiple copies of
19 it sitting here. You're welcome to keep all of
20 them. That is your baby.

21 Q. Three pages total to exhibit --

22 A. Add this. This is the climate wind data
23 for Yuma, Arizona, right there, and that's the wind
24 speed calculation.

25 Q. Okay.

1 A. You could keep it all.

2 Q. Exhibit 17, the front page is your
3 exposure calculations; right?

4 A. It's my summary of his uncertainties, the
5 major uncertainties that I found.

6 Q. Second page talks about wind speed.

7 A. Correct.

8 Q. Hold on. Third page is this?

9 A. Dermal flux.

10 Q. Dermal flux analysis, which is larger than
11 an eight and a half by 11?

12 A. Correct.

13 Q. That's Exhibit 17. Exhibit 18 I will
14 mark --

15 A. That's the same thing, actually. You got
16 that in there.

17 Q. But it has the data with it.

18 A. Yeah, it has the data with it.

19 Q. I will mark that as Exhibit 18.

20 (Whereupon, Exhibit 18 was marked for
21 identification.)

22 MR. PATTON: Let's take a break. Off the
23 record.

24 THE VIDEOGRAPHER: Off the record at

25 12:48 p.m..

1 (Whereupon, a recess is taken.)

2 THE VIDEOGRAPHER: We're back on the

3 record at 12:53 p.m..

4 BY MR. PATTON:

5 Q. Doctor, I'm marking as Exhibit 18, a study
6 called, "Increased Risk of AML, a Multiple Myeloma,
7 and Upstream Petroleum Workers Exposed to Crude
8 Oil."

9 I'm marking as Exhibit 20 --

10 A. Is should be 19.

11 Q. Nineteen.

12 What is this EPA document that I'm marking
13 as Exhibit 20; what effect does it have on your
14 opinions?

15 (Whereupon, Exhibit 19 was marked for
16 identification.)

17 (Whereupon, Exhibit 20 was marked for
18 identification.)

19 THE WITNESS: I believe Table 1 on Page 6,
20 if I remember right, yes, says, "Relative risk as a
21 function of cumulative exposure to benzene," and
22 the risk really starts at 40 to 200 ppm years,
23 which winds up being significant, and that's sort
24 of the sole purpose of having this here.

25

1 BY MR. PATTON:

2 Q. Okay. I want to go back to Exhibit 5,
3 your paper.

4 A. My paper, sure.

5 Q. Turn to Page 184, please.

6 A. I'm there.

7 Q. Near the top there it talks about lack of
8 reliable gasoline/benzene exposure data for the
9 cohorts.

10 A. Right.

11 Q. "The absence of definitive industrial
12 hygiene data for these workers makes derivation of
13 dose and associated concentration risk
14 relationships problematic."

15 A. Correct.

16 Q. You wrote that sentence, you agree with
17 it?

18 A. Absolutely.

19 Q. Whose fault is it that there is a lack of
20 reliable gasoline benzene exposure data?

21 MR. PERRY: Object to form.

22 THE WITNESS: It's not a fault issue, I
23 don't think. It think it's coming. As the studies
24 get more sophisticated, you are getting more data,
25 and I think as a scientist interested in this

1 subject having written this paper, I would look to
2 the data coming out from China in upcoming years,
3 in future years to nail this down.

4 BY MR. PATTON:

5 Q. But specific to gasoline distribution
6 workers, guys like Raul, specific to this case, you
7 agree that there is a lack of reliable gasoline
8 benzene exposure data of workers like him at small
9 bulk terminals; do you agree?

10 A. I agree that there is a lack of data. The
11 problem is that the exposures are way too low to
12 have a significant risk. So when the US EPA says
13 less than 40 ppm years, there's no significant
14 risk, where at 40 to 200, there is significant
15 risk. Between 40 and 200 we don't know, but at 5
16 ppm years or 10 ppm years or 25 ppm years, if we
17 accept Mr. Petty's analysis, there is no risk.

18 Q. But my point, sir, is that part of the
19 problem with -- you call it a major problem with
20 these studies.

21 A. Yeah.

22 Q. Is it the lack of reliable gasoline
23 benzene exposure data, and my point, sir, is that
24 aside from that study from Carolyn Phillips, could
25 you point me to any other document that shows Shell

1 conducted exposure monitoring data for gasoline
2 distribution workers which was then somehow used in
3 a study? There's no data; right?

4 A. No, wait, wait, wait. Shell -- I agree,
5 Shell didn't -- to my knowledge, Shell didn't
6 conduct studies of gasoline distribution workers,
7 but Shell conducted studies of its refinery
8 workers; right? The Tsai papers and so on. And
9 they looked at what kind of exposures they had. In
10 fact, in some of the studies, they have previously
11 said, I showed you a paper this morning by Panko,
12 which is a current 2009 paper where they looked at
13 some other refinery and they have very good
14 monitoring data.

15 Q. Raul didn't work at a refinery; did he?

16 A. No, but he was exposed to gasoline, right,
17 he was exposed to benzene, correct, that's where
18 the analogy is. I agree with you, he didn't work
19 at a refinery.

20 Q. You also agree with me that as it's stated
21 in your paper a year ago, there is a lack of
22 reliable gasoline benzene exposure data in many of
23 these cohorts?

24 A. Lack of reliable doesn't mean you just
25 throw out everything that's out there. There is

1 accumulation of data that today, as we sit here in
2 this conference room, suggests that there is no
3 risk.

4 Q. Would you agree with me that it would
5 be -- we could better analyze this issue of -- the
6 title of your paper, "Is Benzene Exposure from
7 Gasoline Carcinogenic." Some of the highest
8 exposed populations would be gasoline distribution
9 workers when you're talking about gasoline; right?

10 A. Correct.

11 Q. Aside from a refinery where they make
12 gasoline, could you cite me any other job where a
13 man is going to be exposed to a lot of gasoline in
14 benzene?

15 A. No, if you look at the gasoline
16 distribution workers that Rushton published, Leslie
17 Rushton published, there was no increased risk.

18 Q. In the '80s; right?

19 A. Yes. The problem now is you could go out
20 and study these workers -- here's my professional
21 opinion: You could go out now and study all the
22 distribution workers in the U.S., and my prediction
23 is you would not see an increased risk of AML
24 because their exposures are incredibly low.

25 Q. But you can't cite me any data proving

1 their exposures are incredibly low, aside from a
2 couple studies in the '80s and a couple of studies
3 in the '70s, gasoline distribution workers?

4 A. Right, and those didn't show any high
5 exposures.

6 Q. So nothing to worry about?

7 A. No. Why would you expect it to be higher
8 now? Aren't we moving towards reducing benzene in
9 gasoline over the last 30 years?

10 Q. So do you believe there was sufficient
11 research done specific to gasoline distribution
12 workers?

13 A. Well, there's never sufficient research if
14 you ask a scientist; right?

15 Q. Who drives the research; who is in the
16 best position to make that research happen,
17 companies like Shell; do you agree?

18 MR. PERRY: Object to form.

19 THE WITNESS: I don't think so.

20 BY MR. PATTON:

21 Q. Do you see near the bottom right, before
22 we get down to Section 6 on Page 184.

23 A. Correct.

24 Q. It says, "Again, rigorous science looks
25 for consistency between studies."

1 A. Right.

2 Q. You mentioned earlier that you need to
3 have a good number of studies; right?

4 A. Correct.

5 Q. Do you believe that there is sufficient
6 data and that rigorous science has been conducted
7 specific to gasoline distribution workers?

8 A. Yeah, I believe there's sufficient data.
9 Specific to distribution workers, no, maybe not.

10 Q. That was my question, sir.

11 A. Okay.

12 Q. So you agree with me that science has not
13 been rigorous, nor is there sufficient data
14 specific to gasoline distribution workers?

15 MR. PERRY: Object to form.

16 THE WITNESS: I believe the science that's
17 out there for distribution workers is pretty
18 rigorous, but yes, you could always get more data
19 to affirm the negative results.

20 BY MR. PATTON:

21 Q. You brought with you a document on AML.
22 "Leukemia Statistics" is what you called the
23 folder?

24 A. Right, it's different kinds of leukemias.

25 Q. For AML it shows --

1 A. 4.3 per 100,000.

2 Q. All races?

3 A. Right.

4 Q. Hispanic 3.6?

5 A. Correct.

6 Q. So Hispanic people are even less likely to
7 get AML?

8 A. Correct.

9 Q. Same thing for CML, 1.6 per 100,000?

10 A. Right, versus 1.9 in the --

11 Q. All races?

12 A. Right.

13 Q. Hispanic people are even more unlikely.

14 All cancer, again, Hispanics are somewhere near the
15 middle.

16 MR. PATTON: I'll mark this collectively
17 as Exhibit 21.

18 (Whereupon, Exhibit 21 was marked for
19 identification.)

20 MR. PATTON: I'll pass the witness. Thank
21 you for your time.

22 MR. PERRY: Let's take a one-minute break.

23 THE VIDEOGRAPHER: Off the record at
24 1:03 p.m..

25 (Whereupon, a recess is taken.)

1 THE VIDEOGRAPHER: We're back on the
2 record at 1:04 p.m..

3 EXAMINATION BY MR. PERRY

4 Q. Dr. Jamall, Plaintiff's counsel was just
5 asking you some questions about Exhibit 5. I'd
6 like for you, sir, to look at Exhibit 5, the
7 article that you wrote.

8 A. Right.

9 Q. And in particular, turn to Page 183,
10 bottom right-hand corner, last paragraph. Let's do
11 this: Let's go back to Page 182; okay?

12 A. Okay. Right, I'm at 182.

13 Q. 182 on your paper, that was published in
14 the Journal of Environmental Monitoring in 2008.
15 The kind of topic for the part of your paper that
16 starts at the bottom left column of 182 is --
17 what's the topic?

18 A. Gasoline epidemiology.

19 Q. And then on Page 182 and then 183 and then
20 part of 184, you discuss the gasoline
21 epidemiological studies?

22 A. I do.

23 Q. You address various ones of them?

24 A. That's correct.

25 Q. If we look at the bottom right hand of

1 Page 183, after discussing these various gasoline
2 epidemiology studies, and in particular, after
3 discussing the study regarding the District of
4 Columbia study, what does the sentence read there
5 that starts with A on the bottom of Page 183?

6 A. "As noted above, the problems of small
7 cohorts in the multiplicity of statistical tasks,
8 have led several authors to report access in
9 specific cancer sites. Increased mortality,
10 although often not statistically significant, has
11 been reported for total study populations or in
12 subgroups for several cancers including leukemia."

13 Q. Continuing on the with, "A major problem."

14 A. "A major problem with these studies, in
15 addition to those noted previously, is the lack of
16 reliable gasoline benzene exposure data for the
17 cohorts. The absence of definitive industrial
18 hygiene data for these workers makes derivation of
19 dose and associated concentration risk
20 relationships problematic."

21 Q. So on Page 184 of Exhibit 5, when you were
22 referring to the absence of definitive industrial
23 hygiene data for these workers, you were referring
24 specifically to the cohort studies on gasoline
25 workers?

1 A. To the small cohorts that didn't have
2 enough information, and you pop up with
3 statistically significant increase in cancers of
4 Leukemias, and then you wind up with the problem
5 trying to explain them, but they're a function of
6 small cohorts.

7 Q. So this statement about the absence of
8 definitive industrial hygiene data, that was just
9 not a general statement at large about all the
10 various data, it was specific to these cohort
11 studies?

12 A. That's correct.

13 Q. I just want to make sure the jury and the
14 judge understands the context for what you were
15 talking about in regard to those cohorts.

16 A. Right.

17 Q. And the lack of industrial hygiene data
18 for those cohorts.

19 A. Correct.

20 Q. Now let's turn to Exhibit 22.

21 (Whereupon, Exhibit 22 was marked for
22 identification.)

23 MR. PERRY: That's your copy there, Keith.

24 BY MR. PERRY:

25 Q. I want to hand you what's been marked as

1 Exhibit 22. What is Exhibit 22, sir?

2 A. It's a Shell Material Safety Data Sheet.

3 Q. Could you turn to the last page. What is
4 the date?

5 A. It's a March 31, 1998.

6 Q. Now let's go back to the first page, do
7 you see on the product, kind of there, what product
8 is referred to?

9 A. Shell Premium Gasoline conventional CARB
10 and RFG.

11 Q. What does CARB refer to?

12 A. California Air Resources Board.

13 Q. What does the California Air Resources
14 Board have to do with gasoline?

15 A. They regulate the composition of gasoline
16 in California.

17 Q. Okay. And if you look in the bottom
18 left-hand corner, do you see a name and some
19 numbers, bottom left-hand corner, Page 1?

20 A. I'm sorry, McNeece 1400067.

21 Q. I'll represent to you, Dr. Jamall, that
22 this is a document that came from the McNeece's
23 records; in other words, McNeece said in this
24 lawsuit here are the records, and including in the
25 records they produced, the documents, was this

1 Shell 1988 [sic] MSDS for Formula Shell Premium
2 Gasoline, and I want to ask you, earlier you were
3 asked some questions about this, and I think your
4 word was that you "glanced" at it. Have you now
5 had an opportunity to review this MSDS, Exhibit 22,
6 in detail?

7 A. I have.

8 Q. Now I want to ask you some questions about
9 it. In particular, let's turn to Page 2. There is
10 a section on Page 2 that references inhalation.

11 A. Correct.

12 Q. Do you see that?

13 A. I do.

14 Q. And what, according to this 1998 MSDS that
15 was provided to McNeece by Shell two years before
16 Raul Zendejas went to work for McNeece, what did
17 Shell tell McNeece about the -- this is under
18 Subsection 3, Health Information; do you see that?

19 A. I do.

20 Q. And under Subsection 3, Health
21 Information, this 1998 MSDS that Shell provided to
22 McNeece, what did Shell tell McNeece about the
23 inhalation?

24 A. It says, "This product may cause
25 irritation to the nose, throat, and respiratory

1 tract. Additionally, may produce liver and kidney
2 damage. High vapor concentrations may produce CNS
3 depression. Prolonged and repeated exposure to
4 benzene may cause serious injuries to blood-forming
5 organs and is linked to the later development of
6 acute myelogenous leukemia."

7 Q. After 1998, do you consider this
8 inhalation warning that Shell provided to McNeece
9 sufficient and adequate?

10 A. Yes, I do.

11 Q. Let's look on down, still under Section 3,
12 Health Information, there is a reference to a
13 section titled "Other Health Effects"; do you see
14 that?

15 A. I do.

16 Q. Could you read what Shell told McNeece?
17 Let's go down to the reference where it starts
18 with, "In humans," which is right before
19 ethylbenzene, if you could read what Shell in 1998
20 provided to McNeece?

21 A. "The International Agency for Research on
22 Cancer, IARC, has determined that gasoline is
23 possibly carcinogenic to humans. Group 2B. It has
24 been reported that chronic inhalation exposure to
25 an unleaded motor gasoline which was fully

1 vaporized, has produced kidney and liver cancers in
2 some laboratory rodents. See Section 6 for further
3 information. The test material used was blended to
4 represent a typical unleaded motor gasoline.

5 Benzene is listed by the National Toxicology
6 Program, the International Agency for Research on
7 Cancer, and OSHA as a chemical causally associated
8 with cancer (acute myelogenous leukemia) in
9 humans."

10 Q. Dr. Jamall, is it your opinion that as of
11 1998, this information, this warning by Shell about
12 the other health effects, specifically potential
13 cancer effects from gasoline and benzene, were
14 adequate?

15 A. Yes.

16 Q. Were those warnings consistent with the
17 scientific literature?

18 A. In my opinion, yes.

19 Q. Let's keep going, let's go to Page 3. The
20 top of Page 3 refers to Section 5, "Emergency and
21 First Aid Procedures." Do you see a reference to
22 skin contact?

23 A. I do.

24 Q. What did Shell in 1998 warn McNeece about
25 skin contact?

1 A. It says under, "Skin contact," it says,
2 "Flush with water while removing contaminated
3 clothing and shoes. Follow by washing with soap
4 and water. Do not reuse clothing or shoes until
5 cleaned. If irritation persists, get medical
6 attention."

7 Q. And under that, is there a section
8 entitled "Inhalation"?

9 A. There is.

10 Q. And in 1998, under Section 5 of the
11 "Emergency and First Aid Procedures," what did
12 Shell warn McNeece about inhalation?

13 A. It says, "Remove victim to fresh air and
14 provide oxygen if breathing is difficult. Give
15 artificial respiration if not breathing. Get
16 medical attention."

17 Q. Let's turn, sir, to Page 5. Do you see a
18 section at Section 10, "Employee Protection" on
19 Page 5?

20 A. I do.

21 Q. And there is a reference under
22 "Respiratory Protection"?

23 A. Correct.

24 Q. Would you read the warnings that Shell
25 provided to McNeece in 1998 regarding Respiratory

1 Protection?

2 A. "Avoid breathing vapor. Under conditions
3 of potential high exposure, the use of a
4 NIOSH-approved respirator is recommended, per 29
5 CFR 1910.134 or 29 CFR 1910.102 (B) I think it is.

6 Q. Eight?

7 A. Eight.

8 Q. Yeah.

9 A. "Use either an atmosphere-supplying
10 respirator or an air-purifying respirator for
11 organic vapors. For service station personnel, see
12 Section 12."

13 Q. And under this "Employee Protection," the
14 warnings Shell provides to McNeece regarding
15 respiratory protection, what is your opinion on
16 whether those warnings and information were
17 adequate and consistent with the scientific
18 literature?

19 A. They were consistent.

20 Q. Were they adequate?

21 A. They were adequate.

22 Q. The next section under Section 10,
23 "Employee Protection" is "Protective Clothing."
24 What did the Shell warning and the MSDS to McNeece
25 in 1998 say about protective clothing?

1 A. "Avoid contact with eyes, wear chemical
2 gloves if there is a likelihood of contact with
3 eyes. Test data provided from published literature
4 and/or glove and clothing manufacturers indicate
5 the best protection is provided by nitrile rubber,
6 polyvinyl alcohol or viton neoprene."

7 Q. There is a section underneath, and again,
8 sir, is it your understanding that as of 1998,
9 Shell's warnings to McNeece regarding protective
10 clothing were adequate and consistent with the
11 scientific literature?

12 A. Yes, it was.

13 Q. Again, on Section 10, "Employee
14 Protection," do you see a section titled
15 "Additional Protective Measures"?

16 A. I do.

17 Q. What did Shell tell McNeece in 1998 in
18 regards to Employee Protection about Additional
19 Protective Measures?

20 A. It says, "Use explosion-proof ventilation
21 as required to control vapor concentrations."

22 Q. Sir, what is your understanding of
23 controlling vapor concentrations; what would that
24 include, what types of activities?

25 A. That would include a vapor recovery

1 system, moving away from the open hatch while
2 refueling and making sure that this wasn't done in
3 sort of a closed space and you weren't using
4 anything that would result in sparks that might
5 provoke an explosion.

6 Q. Earlier you were asked, Dr. Jamall,
7 whether you think Shell's MSDS to McNeece should
8 provide warnings about vapor recovery; do you
9 recall that?

10 A. Yes, I do.

11 Q. Now that you've had a chance to review in
12 detail the 1998 Shell MSDS, that was in McNeece's
13 files and that has been produced by McNeece in this
14 lawsuit. What is your opinion on whether Shell
15 did, indeed, warn McNeece about the requirement for
16 vapor recovery?

17 A. They did, in fact, suggest that and
18 indicates that, as well as elaborate on the
19 inhalation exposure and to stay away from vapors,
20 and I hadn't looked at this that carefully before.

21 Q. As someone who wrote an article, a
22 peer-reviewed published article in 2008, that
23 addressed both the state of the knowledge as far as
24 benzene and also the state-of-the-art knowledge as
25 far as gasoline, what is your opinion on whether

1 Shell's 1998 MSDS to McNeece was consistent with
2 the state-of-the-art knowledge regarding the
3 hazards of both gasoline and benzene?

4 A. I think they did a good job of explaining
5 the risk.

6 Q. And --

7 A. And the precautionary measures that
8 workers ought to take.

9 Q. So in your opinion, in this MSDS, this
10 1998 MSDS, did Shell adequately provide McNeece
11 with sufficient information so that McNeece could
12 then determine what steps, personal protective,
13 occupational safety, employee protection should be
14 taken by McNeece to protect its workers?

15 A. Yes, they did.

16 MR. PERRY: No further questions.

17 CONTINUED EXAMINATION BY MR. PATTON

18 Q. Dr. Jamall, could you give me an example
19 of explosion-proof ventilation as explained on Page
20 5, give me an example?

21 A. I would say anything that doesn't, as I
22 said, have a spark element to it. So nothing
23 electrical or motor that would include the vapor
24 recovery setups that you have at gasoline stations
25 when you go to fill up your car, as well as

1 stepping away because in the inhalation says, under
2 Respiratory Protection, it says avoid breathing
3 vapor.

4 MR. PATTON: Objection, nonresponsive.

5 BY MR. PATTON:

6 Q. Could you give me an example of
7 explosion-proof ventilation that is described here
8 in section --

9 A. I said vapor recovery.

10 Q. What kind?

11 A. Whatever kind fits on the handle that's
12 used for delivering the gasoline, or you could wear
13 a mask or a respirator and that's already
14 mentioned.

15 Q. What brand of vapor recovery; how big is
16 it?

17 A. I have no clue.

18 Q. Where do I get it; where do I go buy my
19 vapor recovery at?

20 A. Call a petroleum distributor.

21 Q. Call Shell?

22 A. Call Shell, probably, yes.

23 Q. I agree. As required to control vapor
24 concentrations, what do they need to be controlled
25 to, what number?

1 A. Whatever the exposure standards are, which
2 are the OSHA levels, right.

3 Q. Use explosion-proof ventilation as
4 required to control vapor concentrations. Do you
5 know what vapor concentrations are the problem,
6 which ones we're talking about here?

7 A. I'm not sure I understand your question.
8 We are talking about gasoline; right?

9 Q. Well, it says here, "Use explosion-proof
10 ventilation," and you didn't know what kind that
11 meant. You said to go ask Shell --

12 A. Right.

13 Q. -- as required to control vapor
14 concentrations, and you believe the vapor
15 concentrations, does that refer to the occupational
16 exposure limits?

17 A. That refers, in my opinion, to all vapors,
18 yeah, that have -- there are standards for all of
19 them, right, not just benzene, but benzene,
20 gasoline.

21 Q. But looking up at Page 5 here,
22 "Respiratory Protection."

23 A. Right.

24 Q. "Avoid breathing vapor under conditions of
25 potential high exposure."

1 A. Right.

2 Q. What is meant by "potential high
3 exposure"?

4 A. I would interpret that, I'm not an
5 industrial hygienist, but I would interpret that as
6 being the STEP, the Short-Term Exposure Limit.

7 Q. How would one know that the conditions
8 have a potential for high exposure; how would
9 McNeece know if his conditions that his employees
10 are working at have a potential high exposure?

11 A. He would have to look at the literature or
12 ask somebody or do monitoring.

13 Q. He didn't know in his testimony?

14 A. In his testimony he didn't know.

15 Q. And you had no criticisms of him earlier
16 for not knowing; right?

17 A. Because I said he's in the same league as
18 everybody else in this business.

19 Q. But you believe that's adequate?

20 A. Yes.

21 Q. All right, let's go back to Page 2. Up
22 there in "Inhalation," under "Health Information."

23 A. Correct.

24 Q. "Prolonged and repeated exposure to
25 benzene --"

1 A. Right.

2 Q. What is meant by "prolonged" and what is
3 meant by "repeated"?

4 A. This is where the "repeated" came in that
5 you asked me about very early on.

6 Q. What is the definition of those terms?

7 A. I would interpret this to mean chronic
8 exposures, meaning weeks or months of exposure, not
9 hours or days.

10 Q. Where in here does it tell McNeece what is
11 meant by "prolonged" and "repeated"; where are
12 those terms defined?

13 A. Those terms are not defined here.

14 Q. They're not?

15 A. They're not.

16 Q. It's vague, you would agree with me?

17 MR. PERRY: Object to form.

18 THE WITNESS: I would agree. It's not
19 spelled out here.

20 BY MR. PATTON:

21 Q. In your opinion, it could be weeks,
22 months, years. I could bring another doctor in
23 here, he could give another definition; right?

24 MR. PERRY: Object to form.

25 THE WITNESS: Well, I think if you look

1 at -- we're looking at this in terms of the ability
2 of this exposure to cause disease, and so we
3 already know, we've talked about this for a while
4 now, that the exposures have to be chronic, have to
5 be prolonged, have to be over many years, have to
6 be at a fairly high level.

7 Q. Chronic, prolonged, repeated, high level.

8 A. Correct.

9 Q. Where are the definitions of those terms
10 in this MSDS such that McNeece could understand it?

11 A. I would say it's not here.

12 Q. Okay. Then going down to "Other Health
13 Effects."

14 A. Right.

15 Q. It says down there that benzene is a
16 chemical causally associated with cancer. Is
17 "associated" as strong of a term as "causes"; do
18 you know?

19 A. "Associated" means there is a
20 relationship.

21 Q. "Associated" means there is a
22 relationship?

23 A. And "causal" means definitely will.

24 Q. Do you believe that there is definitely a
25 connection between benzene and AML?

1 A. Yes.

2 Q. So this isn't accurate. This could state
3 it more definitive; right?

4 MR. PERRY: Object to form.

5 THE WITNESS: By just removing the word
6 "causally" or removing the word "associated."

7 BY MR. PATTON:

8 Q. Okay.

9 A. In 1998 I don't think it was as definitive
10 as it is today.

11 Q. Was benzene --

12 A. Benzene was not. We talked about it.

13 Q. It's at the bottom there. You are
14 smirking. You are agreeing with me this is
15 inadequate; don't you?

16 MR. PERRY: Object to form.

17 THE WITNESS: I'm not smirking, first of
18 all, but I'm not agreeing with you. The best way,
19 if I was writing it, I would take out the word
20 "associated" and say "causally."

21 BY MR. PATTON:

22 Q. You said earlier you would insert the
23 information about blood, breath, and urine; right?

24 MR. PERRY: Object to form.

25 THE WITNESS: I would.

1 BY MR. PATTON:

2 Q. You would. Down at the bottom,
3 "Classified by ACGIH as a suspected human
4 carcinogen." I thought you said earlier that it's
5 known; right?

6 A. Right, but like I said, by the time these
7 regulatory bodies come around to writing their
8 regulations, this is not a regulatory body, but
9 it's a group of government industrial hygienists
10 that's widely respected, it takes years.

11 Q. Have you seen any documents in this case
12 or otherwise where Shell evaluated the
13 effectiveness of this -- of these MSDSs, whether or
14 not people like McNeece or even Raul read and
15 understand them?

16 A. I did not see any such evidence.

17 Q. Have you seen any studies or any evidence
18 that talk more generally about whether companies
19 and industry, what their understanding of how well
20 received and understood these MSDSs are?

21 A. I haven't seen any studies on this.

22 Q. I guess could you explain to me how you
23 believe an MSDS could be considered adequate when a
24 company like Shell hasn't even investigated whether
25 or not its workers, downstream workers understand

1 them?

2 MR. PERRY: Object to form. Assumes a
3 duty the law doesn't recognize.

4 BY MR. PATTON:

5 Q. Your lawyer brings up a good point. You
6 don't believe that Shell has a duty or a
7 responsibility to make sure companies understand
8 these?

9 A. They have a duty -- you know, the thing
10 about MSDS sheets -- I've written some of these
11 back early on in my career -- is that there's a
12 prescribed form. There are so many sections and so
13 many things have to go into it and there's so many
14 pages. So you are sort of -- it's more a
15 governmental prescription. If you fill out your
16 IRS 1040, you can't write little stories about what
17 happened when your dog died and you spent \$10,000
18 on your dog's medical care. So you are a little
19 bit constrained in what you can and cannot do in an
20 MSDS sheet, but there is some latitude, I would
21 agree.

22 Q. Besides an MSDS, is there any law that
23 prevents a company like Shell from providing
24 additional warnings or trainings -- or training
25 material in a format besides an MSDS?

1 MR. PERRY: Object to form.

2 THE WITNESS: Prevents?

3 BY MR. PATTON:

4 Q. Prevents.

5 A. There is no law preventing anything,
6 that's why we live in America, it's not Iran.

7 MR. PATTON: Thank you, sir.

8 MR. PERRY: I have some follow-up
9 questions.

10 CONTINUED EXAMINATION BY MR. PERRY

11 Q. Let's stay with Exhibit 22, Page 2,
12 Section 4. Let's turn back to Page 1 under Section
13 2(A) where it talks about composition.

14 A. Right.

15 Q. You see where P refers to Formula Shell
16 Premium Gasoline? Do you see that P, and then
17 beside it is Formula Shell Premium Gasoline under
18 "Composition," middle of the page?

19 A. Yes.

20 Q. Below it it's got items listed one through
21 13, various constituents that are in gasoline;
22 correct?

23 A. Yes.

24 Q. Now let's flip over to Page 2, Section 4,
25 "Occupational Exposure Limits."

1 A. Right.

2 Q. Then we start with P.

3 A. Right.

4 Q. Which would be the gasoline.

5 A. Right.

6 Q. And then there is an OSHA limit and a
7 ACGIH limit, there's a time weighted average, and
8 there is also a PEL or STEL under OSHA.

9 A. Right.

10 Q. And then there's one for ACGIH.

11 A. Right.

12 Q. What is OSHA?

13 A. Occupational Safety and Health
14 Administration.

15 Q. What do they do as far as setting TWA;
16 what is a TWA and why does OSHA set it?

17 A. TWA is a time weighted average, and that's
18 typically over a eight-hour workday and that's at a
19 level of exposure that an employee could have
20 consistently everyday of their working life for up
21 to 40 years, which is considered the average work
22 life with no adverse health effects.

23 Q. What's a PEL or a slash STEL?

24 A. STEL is a short-term limit. So that's
25 when you could have an excursion in the number, but

1 it's only for 15 minutes typically.

2 Q. In Section 4 of Exhibit 22 under
3 Occupational Exposure Limits, Shell provided
4 McNeece with the PEL time weighted average and the
5 STEL short-term exposure OSHA limits for gasoline
6 in the various constituents; correct?

7 A. Correct.

8 Q. Shell also provided the TLV limits for
9 exposure as determined by the American Conference
10 of Governmental Industrial Hygienists, what's called
11 the ACGIH.

12 A. Correct.

13 Q. So when Exhibit 22, Section 4, we see
14 Shell providing McNeece with the occupational
15 exposure limits for gasoline and the various
16 components of gasoline.

17 A. Correct.

18 Q. At this point once Shell provides this
19 information, this government-prescribed series of
20 warnings and information, the duty of how to train
21 and protect their people rests exclusively with
22 McNeece; doesn't it?

23 A. I would agree with that.

24 MR. PERRY: Thank you. No further
25 questions.

1 MR. PATTON: Is benzene a known or is it a
2 suspected human carcinogen?

3 THE WITNESS: It's a known carcinogen.

4 MR. PATTON: That's it. Off the record.

5 THE VIDEOGRAPHER: This is the end of Disk
6 Number 2, Volume 1 in the deposition of Ija Jamall.
7 We've been on the record for one hour [sic] and 57
8 minutes. The time is 1:28 p.m. and we are off the
9 record.

10 (Deposition is concluded at 1:28 p.m..)

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

DECLARATION

I hereby declare I am the deponent in the within matter; that I have read the foregoing deposition and know the contents thereof, and I declare that the same is true of my knowledge except as to the matters which are therein stated upon my information or belief, and as to those matter, I believe it to be true.

I declare under penalties of perjury of the State of California that the foregoing is true and correct.

Executed on the _____ day of _____, 2009 at _____, California.

Ijaz S. Jamall, Ph.D., DABT

1 STATE OF CALIFORNIA)
) ss

2 COUNTY OF SACRAMENTO)

3 I, MARYANN H. VALENOTI, a Registered
4 Professional Reporter and Certified Shorthand
5 Reporter, do hereby certify:

6 That prior to being examined, the witness
7 in the foregoing proceedings was by me duly sworn
8 to testify to the truth, the whole truth, and
9 nothing but the truth;

10 That said proceedings were taken before me
11 at the time and place therein set forth and were
12 taken down by me in shorthand and thereafter
13 transcribed into typewriting under my direction and
14 supervision;

15 I further certify that I am neither
16 counsel for, nor related to, any parties to said
17 proceedings, nor in anyway interested in the
18 outcome thereof.

19 In witness whereof, I have hereunto
20 subscribed my name.

21

22 Dated: October 19, 2009

23 _____

24 Maryann Valenoti, RPR

25 CSR No. 11266

1 October 19, 2009

2 Ijaz S. Jamall, Ph.D., DABT
3 1540 River Park Drive, Suite 203
4 Sacramento, California 95815

5 Re: Raul Zendejas v. Shell Oil Company

6 Dear Dr. Jamall,

7 Please be advised that the original
8 transcript of your deposition taken October 15,
9 2009, in the above-entitled matter is available for
10 reading and signing. The original transcript will
11 be held in our offices for thirty (30) days in
12 accordance with California Code of Civil Procedure
13 Section 2025 (q) (1).

14 "For thirty days following this notice,
15 the deponent, either in person or by signed letter
16 to the deposition officer, may change the form or
17 substance of the answer to any question, and may
18 either approve the transcript of the deposition by
19 signing it, or refuse to approve the transcript by
20 not signing it."

21 If you are represented by counsel in this
22 matter, you may wish to ask your attorney how to
23 proceed. If you are not represented by counsel and
24 wish to review your transcript, please contact our
25 office for a mutually convenient appointment to
26 review your deposition.

27 Thank you for your cooperation in this
28 matter.

29 Sincerely,

30 Maryann Valenoti, RPR
31 CSR No. 11266
32 cc: All counsel
33 The deponent