

# Deposition Testimony of:

## **Amy Merten**

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Page 9:14 to 10:01

00009:14 please -- I represent BP. Could you please  
15 state your name for the record and spell your  
16 last name?  
17 A. It's Amy Ann Merten,  
18 M-e-r-t-e-n.  
19 Q. And, Dr. Merten, who is your  
20 employer?  
21 A. It's NOAA, the National Oceanic  
22 and Atmospheric Administration.  
23 Q. And what is your title?  
24 A. I'm the chief of the spatial  
25 data branch in the office of response  
00010:01 administration.

Page 12:21 to 14:01

00012:21 Q. (BY MR. ISRAEL) Dr. Merten, you  
22 have before you Exhibit 11758, which is the  
23 court's supplemental order dated May 30th,  
24 2014 regarding BPXP's Motion to Compel  
25 Discovery from U.S. Do you see that?  
00013:01 A. Yes.  
02 Q. And this relates to BPXP's  
03 request for testimony pursuant to  
04 Rule 30(b)(6). Do you see that?  
05 A. Yes, I do.  
06 Q. Do you understand what 30(b)(6)  
07 testimony is?  
08 A. I do.  
09 Q. And are you designated by the  
10 United States to testify with respect to  
11 topic 1?  
12 A. I am.  
13 Q. And do you see topic No. 1  
14 states, "Your knowledge of data as of  
15 December 31, 2013 regarding the nature and  
16 extent of any environmental impacts from the  
17 Deepwater Horizon Spill, including any  
18 environmental resources as to which You  
19 contend there has been no or limited  
20 recovery"? Is that -- did I read that  
21 correctly?  
22 A. Yes.  
23 Q. And you're designated by the  
24 United States to testify about -- about this  
25 topic?  
00014:01 A. Yes, I am.

Page 15:04 to 15:09

00015:04 Q. (BY MR. ISRAEL) Are you  
05 prepared to testify today about the NO -- the  
06 NOAA data set collected as part of the

07 Natural Resources Damage Assessment for the  
08 Deepwater Horizon oil spill?  
09 A. Yes.

Page 16:10 to 16:24

00016:10 Q. Have you been involved in the  
11 Deepwater Horizon Natural Resource Damage  
12 Assessment?  
13 A. Yes.  
14 Q. Could you describe your  
15 involvement?  
16 A. I am the lead for the data  
17 management technical working group.  
18 Q. What is the data management  
19 technical working group?  
20 A. It's one of the groups under the  
21 cooperative damage assessment that's  
22 responsible for tracking data and delivering  
23 data collected for the Natural Resource  
24 Damage Assessment for the Deepwater Horizon.

Page 17:06 to 18:06

00017:06 Q. (BY MR. ISRAEL) And what is the  
07 cooperative damages assessment?  
08 A. The cooperative damage  
09 assessment is a process under the Oil  
10 Pollution Act of 1990 and it's a process of  
11 assessing injury of resources and the end  
12 game being restoration of those resources.  
13 So it's cooperative with BP.  
14 Q. And when BP -- BP cooperates in  
15 a Natural Resource Damage Assessment work  
16 plan, does that mean BP is paying -- paying  
17 for the data collection?  
18 A. It -- it could be. It does  
19 depend on the -- on the work plan, but for  
20 the most part BP has paid for the cooperative  
21 work plans.  
22 Q. How many cooperative NRDA work  
23 plans are there?  
24 A. I believe there are over 200.  
25 Q. And is it okay if we say "NRDA"  
00018:01 when we -- when we talk --  
02 A. Please.  
03 Q. Okay. So we're going to say  
04 NRDA, and that means the Natural Resource  
05 Damage Assessment.  
06 A. Great.

Page 19:11 to 19:18

00019:11 Q. When BP pays for a NRDA work

12 plan, do the trustees maintain responsibility  
13 for the implementation of that work plan?

14 A. They do.

15 Q. Is it required under OPA, to  
16 your understanding, that BP pay for the NRDA  
17 data collection?

18 A. For the majority --

Page 19:21 to 20:01

00019:21 A. (Continuing) It's my  
22 understanding the majority of those studies  
23 have been paid for by BP.

24 Q. (BY MR. ISRAEL) Do you know if  
25 BP is required to pay for those study plans  
00020:01 at this time?

Page 20:03 to 20:08

00020:03 A. They're not required, but the --  
04 the rule calls for the trustees have to  
05 present their assessment costs to the  
06 responsible party first, and then the  
07 responsible party has the option of denying  
08 that claim or paying it.

Page 26:08 to 27:24

00026:08 Q. (BY MR. ISRAEL) And you also  
09 mentioned the toxicity spreadsheet, I  
10 believe?

11 A. Yes.

12 Q. Is that -- if I could mark the  
13 index of exchange database, it's Tab 4.

14 MR. MARSTON: Tab 5.

15 Q. (BY MR. ISRAEL) I'm sorry,  
16 Tab 5. We are marking that as Exhibit 11760.  
17 Dr. Merten, if you could review  
18 the document and tell me if this is the list  
19 of toxicology studies that you referenced  
20 earlier.

21 A. I believe it is the "read me"  
22 tab of the -- of the file I was referencing.

23 Q. Okay. And then if you go past  
24 the blue divider, is that the list?

25 A. Ah. Yes, this is the list.

00027:01 Q. And could you just describe what  
02 this is a list of, please?

03 A. Sure. It is -- it is an Excel  
04 file that has a test ID for several --  
05 several tests, the initiation dates, what  
06 laboratory conducted the testing, the test  
07 substrate, the mixing method, the common name  
08 of the organism exposed, the scientific name

09 of the organism exposed, the life stage, end  
10 points that were measured, the conditions of  
11 the -- the water, what matrix, the duration  
12 of the exposure. And this is where it  
13 references the chapter of the GL -- it's  
14 LL -- LPP here, but it's called the GLPP.  
15 And then it identifies where in that  
16 document, the testing protocol our -- and  
17 then I can't read the little, but -- oh,  
18 whether or not they sent -- they took samples  
19 to send to chemistry lab ALS and whether they  
20 took video or -- or photos, and then some  
21 remarks.  
22 Q. Dr. Merten, I'd like to mark  
23 Exhibit 11761, which is Tab 90 in your  
24 binder.

Page 28:05 to 30:11

00028:05 Q. (BY MR. ISRAEL) Dr. Merten, do  
06 you recognize this document 11761?  
07 A. I do.  
08 Q. What is it?  
09 A. I believe this is the -- from  
10 the table of contents for the terminated  
11 studies.  
12 Q. And what is a terminated study?  
13 A. If I understand, the terminated  
14 study would be studies that were conducted  
15 for range finding or studies that had high  
16 mortality in the controls. Those are --  
17 those are some examples of why a study would  
18 have been terminated.  
19 Q. You have been designated by the  
20 United States to testify about the trustees  
21 toxicity study, correct?  
22 A. Correct.  
23 Q. And are you prepared today to  
24 testify about the various toxicity studies  
25 and the methodologies undertaken by the  
00029:01 United States as part of the NRDA?  
02 A. I'm prepared to talk about  
03 the -- the data and the methodologies, yes.  
04 Q. Okay. What is a toxicity study?  
05 A. A toxicity study is a -- a  
06 lab-based study where you're exposing an  
07 organism to some contaminant for a period of  
08 time and measuring different end points.  
09 Q. Toxicity studies are done in the  
10 laboratory; is that correct?  
11 A. They are.  
12 Q. How many toxicity studies has  
13 the trustees conducted as part of the  
14 Deepwater Horizon NRDA?  
15 A. In total, including terminated

16 studies, I believe they're in the  
 17 neighborhood of 500. I'd have to refer to  
 18 the -- the database for -- there are 200 --  
 19 or 300 and -- over 300 studies that I -- that  
 20 are in that database right now.

21 Q. If you look at Tab 5, we looked  
 22 at that earlier, I believe there's 298  
 23 studies listed. Does that sound correct to  
 24 you?

25 A. That sounds correct, yes.

00030:01 Q. And if you look at Tab 90, the  
 02 terminated studies, there are 106 studies  
 03 listed on Tab 90. Does that sound correct to  
 04 you?

05 A. That sounds correct.

06 Q. So the total is -- for those two  
 07 exhibits, there are 404 studies. Does that  
 08 sound correct?

09 A. Sure.

10 Q. So where could I find the other  
 11 100 toxicity studies?

Page 30:15 to 30:17

00030:15 A. I was rounding, so I would have  
 16 to look at the database to look at the -- the  
 17 numbers.

Page 31:23 to 33:23

00031:23 Q. Can you describe the method the  
 24 United States has utilized as part of the  
 25 Deepwater Horizon NRDA for its laboratory  
 00032:01 toxicity studies?

02 A. I'm sorry, would you repeat that  
 03 question?

04 Q. Yes. Can you describe the  
 05 method that the United States has utilized in  
 06 the Deepwater Horizon Natural Resource Damage  
 07 Assessment for conducting toxicity studies?

08 A. Well, I believe we used several  
 09 different methodologies, and they are  
 10 described in that GLPP that I mentioned at  
 11 the beginning. So it really depends on what  
 12 study.

13 Q. Can you describe generally the  
 14 method?

15 A. Generally a method?

16 Q. Generally the method that the --  
 17 that the United States has used for its  
 18 toxicity studies as part of the NRDA.

19 A. Sure. We used standard toxicity  
 20 study methods. It really -- it does vary by  
 21 species, but in -- in general making sure the  
 22 organisms that they're using are healthy to

23 start the experiment. They look at -- they  
24 made sure that each treatment has replicates  
25 of four, so that they can understand what the  
00033:01 ability is among the treatments. They've  
02 looked at -- they have ensured that  
03 they're -- they're measuring water quality  
04 for all of their test chambers. They are  
05 measuring the contamination. They're  
06 producing nominal concentrations, but they're  
07 also measuring the -- the exposure  
08 concentration through chemical analyses.  
09 They are setting up appropriate controls.  
10 So they're all pretty standard  
11 practices, making sure that they've got  
12 controlled environments and that they know  
13 what they are, so light -- light periods,  
14 dark periods. And, like I said, it depends  
15 on the study, whether it's a status study and  
16 they're not doing anything with the water for  
17 that 96 hours, for example, or they're  
18 renewing it, but that would go through a  
19 system. So it really -- it does tend to be  
20 test specific, but I think I've covered kind  
21 of the general principles for toxicity  
22 testing protocols in kind of a standardized  
23 way.

Page 34:12 to 35:19

00034:12 Q. (BY MR. ISRAEL) The -- how is  
13 the -- the organisms that you're testing on a  
14 toxicity study, Dr. Merten, are exposed to  
15 oil in water; is that correct?  
16 A. Yes.  
17 Q. And how is that -- is there a  
18 mixture of oil and water?  
19 A. Yes.  
20 Q. How is that created?  
21 A. I believe they were using a  
22 pretty standard method for mixing the oil and  
23 water under a couple of different regimes, so  
24 a low-energy water-accommodated fraction,  
25 high-energy water-accommodated fraction, as  
00035:01 well as a chemically-enhanced  
02 water-accommodated fraction. And they were  
03 using standard methods for doing that. It's  
04 described in that document we just mentioned,  
05 the GLPP.  
06 And then those tox- -- so the  
07 stock solutions are then diluted, depending  
08 what concentration range they're testing. So  
09 I think generally try to look at orders of  
10 magnitude differences so that they can  
11 generate a dose response curve.  
12 Q. And you -- I believe you said

13 that the investigators were using standard  
14 methods?  
15 A. There is a standard method for  
16 creating these CEWAFs and these -- the --the  
17 chemically-enhanced water-accommodated  
18 fractions, the high-energy and low-energy  
19 water-accommodated fractions.

Page 35:23 to 37:12

00035:23 Q. Okay. And for -- for purposes  
24 of today is it okay if we refer to  
25 water-accommodated fraction as WAF?  
00036:01 A. Yep.  
02 Q. And the high-energy  
03 water-accommodated fraction as a HEWAF?  
04 A. Sure.  
05 Q. Okay. Would it be possible to  
06 conduct a tox- -- a toxicity study on actual  
07 water from the Gulf of Mexico containing oil  
08 from the Deepwater Horizon?  
09 A. Yes, it's possible.  
10 Q. Was that done in this case?  
11 A. I believe it was. They had  
12 obtained two samples of slick oil and used  
13 that to generate their WAF or their -- their  
14 exposures.  
15 Q. Is it possible to obtain  
16 contaminated water from the water column and  
17 that would already contain a  
18 water-accommodated fraction of -- of oil from  
19 the Deepwater Horizon?  
20 A. The -- it's possible.  
21 Q. Was that done in this case?  
22 A. I don't believe it was.  
23 Q. Okay. I'm going to ask you to  
24 look at exhibit -- we're going to mark  
25 Exhibit 117 -- I'm sorry, 11762. It's Tab 12  
00037:01 in your binder. This is a document,  
02 Dr. Merten, from Michel Gielzayn and Rob  
03 Ricker of NOAA, dated April 20th, 2011 to  
04 Ralph Markarian. Do you see that document?  
05 A. I do.  
06 Q. Have you -- are you familiar  
07 with this document?  
08 A. I think I've seen it before, but  
09 I probably would need to skim it a little bit  
10 to --  
11 Q. And do you know who --  
12 A. -- understand it.

Page 38:07 to 38:17

00038:07 Q. If I could draw your attention  
08 to the first paragraph, do you see where it



09 states, "The composition and concentration if  
10 petroleum hydrocarbons in WAFs can differ  
11 depending upon the protocol used to mix oil  
12 and water"?

13 A. Yes.

14 Q. Do you agree with that  
15 statement?

16 A. I do.

17 Q. What does it mean?

Page 39:04 to 42:24

00039:04 It differs really based on the  
05 oil and its weathered state. It -- and it --  
06 it differs in the energy that you apply to  
07 it. So you're going to get a different --  
08 you're going to get a lower WAF with a  
09 low-energy mixing.

10 Q. Is it important to -- to  
11 understand how different protocols could  
12 result in different compositions or  
13 concentrations?

14 A. Yes.

15 Q. If I could ask you to look just  
16 a couple sentences down, do you see where it  
17 states, The WAF, which is typically drawn off  
18 the -- drawn off near the bottom of the  
19 mixing container, may contain dissolved and  
20 particulate oil, depending on the protocol  
21 used to prepare the mixture. Do you agree  
22 with that?

23 A. I do.

24 Q. Is it important to understand  
25 the differences between dissolved oil and oil  
00040:01 droplets when conducting a toxicity test?

02 A. Yes.

03 Q. Why?

04 A. Well, you're going to have a  
05 different pathway of exposure from a dissolve  
06 versus a particulate oil and particulate --  
07 the particulate oil is going to have a higher  
08 concentration than the -- the water-only  
09 fraction.

10 Q. And that difference could affect  
11 the toxicity of the -- on the organisms?

12 A. It could.

13 Q. Okay. On Page 2 if I could ask  
14 you to look at the -- the last sentence  
15 before the reference section. "The study  
16 designed for each toxicity test will include  
17 multiple WAF preparations that represent  
18 different chemical compositions that may have  
19 existed in the field." Do you see that?

20 A. Yes, I do.

21 Q. Have each of the 400 or so

22 toxicity studies conducted by the United  
23 States included multiple WAF preparations  
24 that represent different chemical  
25 compositions that may have existed in the  
00041:01 field?  
02 A. Yes.  
03 Q. And are the results from those  
04 different WAF preparations in the data that  
05 you've provided to BP?  
06 A. I believe that the -- yes, the  
07 chemical analyses that would have verified  
08 the WAFs, the CEWAFs and all that, if they  
09 have been validated, they have been provided.  
10 Q. Would each of the toxicity  
11 studies conducted by the United States as  
12 part of the Deepwater Horizon NRDA have  
13 included a low-energy WAF?  
14 A. I believe that some of them  
15 would have had that, yes.  
16 Q. How many of them?  
17 A. I would have to go through the  
18 database and count.  
19 Q. Can you say approximately what  
20 percentage of the -- of the 400 have included  
21 a low-energy WAF?  
22 A. I would guess between 10 and  
23 25 percent.  
24 Q. And what percentage  
25 approximately included a high-energy WAF?  
00042:01 A. About the same percentage. 10  
02 to 25 percent.  
03 Q. So just so I'm understanding  
04 correctly, about 10 to 25 percent of the  
05 toxicity studies undertaken by the United  
06 States utilized a high-energy WAF?  
07 A. I believe so.  
08 Q. And what -- what percentage  
09 utilized a chemical WAF?  
10 A. I believe in that same 10 to  
11 25 percent range.  
12 Q. So how -- how was the -- every  
13 toxicity study has to have a  
14 water-accommodated fraction preparation; is  
15 that correct?  
16 A. Yes. Well, it -- it -- it could  
17 have a sediment exposure, but overall for  
18 the -- the water exposure studies, yes, they  
19 would have a -- a water accommodated  
20 fraction.  
21 Q. Okay. And of the water toxicity  
22 studies conducted by the United States  
23 approximately how many percentage -- what  
24 percentage of those utilize a HEWAF?

00043:01 A. Again, I'm just really -- kind  
02 of just dividing up the studies or the  
03 different water exposures, low energy --  
04 control, low energy, high energy, chemical  
05 enhanced. Roughly 10 to 25 percent ranges,  
06 given that some of the -- of the water  
07 exposed studies.

Page 43:18 to 44:01

00043:18 Q. Are you aware of any -- any  
19 toxicity studies on the -- any water toxicity  
20 studies, are you aware of any conducted by  
21 the United States as part of this NRDA that  
22 compared the toxicity to organisms from a  
23 high-energy water-accommodated fraction to a  
24 low-energy water-accommodated fraction?  
25 A. Yes, there are studies that have  
00044:01 done that.

Page 44:22 to 49:07

00044:22 Q. (BY MR. ISRAEL) Let me ask you  
23 to turn to Page 5 of Exhibit 11762. This is  
24 the SOP for high-energy water-accommodated  
25 fractions. Do you see that?  
00045:01 A. I do.  
02 Q. So the -- the methodology is for  
03 scientists to take oil and put it into a  
04 blender; is that correct?  
05 A. Correct.  
06 Q. That's a -- a commercial food  
07 blender?  
08 A. Correct.  
09 Q. Okay. And then the oil is -- is  
10 mixed for 30 seconds, according to this  
11 protocol, correct? If you look on Page 7.  
12 A. Yes.  
13 Q. Why 30 seconds?  
14 A. I believe that that's enough  
15 time so you have a well-mixed liquid.  
16 Q. Does the --  
17 A. So it's standard between labs,  
18 so everybody does it the same amount.  
19 Q. Okay. Could the time -- time of  
20 blending impact the composition or  
21 concentration of petroleum hydrocarbons in  
22 the WAF?  
23 A. It could.  
24 Q. How?  
25 A. I mean, at some point you're  
00046:01 going to reach saturation. I believe at  
02 30 seconds you're going to -- you're going to  
03 saturate your water column with the oil that

04 you have in there, so you're not going to get  
05 anything else in the water-accommodated  
06 fraction after that -- that point.  
07 Q. Could the time of blending  
08 impact the -- the composition of oil  
09 droplets?  
10 A. Yes. Again, but you're going to  
11 reach a steady state in the -- the droplet  
12 distribution.  
13 Q. What about the size of the  
14 droplets, could the time of blending impact  
15 the size of the droplets?  
16 A. It could.  
17 Q. What about the -- the speed of  
18 the blender, could that impact the  
19 composition or concentration of the  
20 hydrocarbon -- hy- -- petroleum hydrocarbons  
21 in the WAF?  
22 A. Yes.  
23 Q. After the blending, the mixture  
24 is allowed to settle; is that correct?  
25 A. Yes.  
00047:01 Q. And how long is it allowed to  
02 settle?  
03 A. It looks like for an hour.  
04 Q. Does the nature of the HEWAF  
05 change depending upon how long the mixture is  
06 allowed to settle?  
07 A. Yes.  
08 Q. Why is that?  
09 A. After -- after -- it's going  
10 to -- it's going to separate somewhat back  
11 out. So you're going to end up -- after you  
12 let it sit there for a while, you're going to  
13 have an oil slick back on the surface of your  
14 mixing chamber.  
15 Q. Well, do droplets take different  
16 amounts of time to surface, depending upon  
17 their size?  
18 A. Yes.  
19 Q. If you allow the mixture to  
20 settle for a longer period of time, the HEWAF  
21 will have fewer droplets; is that a fair  
22 characterization?  
23 A. Yeah, fairer -- you'll have less  
24 of the -- the larger droplets, yes.  
25 Q. And the mixture -- for purposes  
00048:01 of doing the dilution you referenced earlier,  
02 the mixture is taken from the bottom; is that  
03 correct?  
04 A. Yes.  
05 Q. Why is that?  
06 A. So you're getting more of  
07 the pure water-accommodated fraction  
08 component. You're going to have less --  
09 you're going to have less droplets in the --

10 in the bottom.  
11 Q. But there'll be some droplets in  
12 the bottom?  
13 A. There could be small droplets in  
14 the bottom.  
15 Q. Is the sample filtered after  
16 it's been drawn -- been drawn from the  
17 mixture?  
18 A. It looks like they're -- yes,  
19 they are filtering it.  
20 Q. After the sample is drawn from  
21 the mixture, how is it stored? Just  
22 generally speaking.  
23 A. I believe you store it for 24  
24 hours prior to using it, and they store it in  
25 a 4-degree Centigrade refrigerator.  
00049:01 Q. Will the chemical and physical  
02 characteristics of the mixture remain the  
03 same over time, if you know?  
04 A. For that short -- for a 24-hour  
05 period and 4 -- at 4 degrees C in a dark  
06 chamber it's not going to change very much.  
07 It will change over a longer period of time.

Page 49:12 to 50:21

00049:12 Q. (BY MR. ISRAEL) Once the HEWAF  
13 is created, it's diluted; is that correct?  
14 A. I believe.  
15 Q. Why is that?  
16 A. You're diluting it to a  
17 concentration range that is realistic, so  
18 you've got a high concentration coming out of  
19 the stock tank and you're diluting it to  
20 something that's more realistic.  
21 Q. Do you have data indicating that  
22 the dilution of the HEWAF in the lab is  
23 similar to the -- to the field?  
24 A. I think that's an interpretation  
25 question.  
00050:01 Q. Well, I'm just asking if you  
02 have data -- are you aware of any data  
03 indicating that the dilution that's  
04 undertaken in the laboratory is similar to  
05 the conditions in the Gulf of Mexico?  
06 A. The tox- -- the toxicity studies  
07 are designed to be as similar as possible,  
08 but there are data -- there are -- there are  
09 field data and there are lab studies.  
10 Q. Are you aware -- aware of any  
11 effort to compare the concentration and the  
12 composition of the HEWAF mixture to  
13 conditions in the Gulf of Mexico?  
14 A. I don't believe that would be in  
15 my scope, but I can --

16 Q. I just asked you if you're aware  
17 of any efforts to compare the concentration  
18 and composition of the HEWAF mixture utilized  
19 in the -- in NOAA's toxicity studies in the  
20 laboratory to the conditions in the Gulf of  
21 Mexico.

Page 50:24 to 51:01

00050:24 A. I believe people have looked at  
25 the field-collected data and the toxicity  
00051:01 chemistry data and looked at the comparison.

Page 51:07 to 51:11

00051:07 Q. Have the results from those  
08 comparisons been provided to BP?  
09 A. The results of the comparisons?  
10 Q. Yes.  
11 A. I don't believe so.

Page 54:04 to 54:20

00054:04 Q. (BY MR. ISRAEL) Dr. Merten, we  
05 were talking about the differences between  
06 the HEWAF and the -- the standard low-energy  
07 WAF. And my question is do you -- would --  
08 would a HEWAF have a different number --  
09 result in a different number of droplets  
10 compared to the standard low-energy WAF?  
11 A. Yes.  
12 Q. What causes that difference?  
13 A. The energy associated with  
14 mixing. You're driving air into the --  
15 creating droplets within that -- that  
16 mixture.  
17 Q. And do you have -- do you know  
18 if a HEWAF would result in different size of  
19 droplets compared to the -- the standard  
20 low-energy WAF?

Page 54:22 to 55:04

00054:22 A. You -- yeah, you would have  
23 smaller droplet sizes in the HEWAF.  
24 Q. (BY MR. ISRAEL) You would have  
25 smaller droplet sizes in the HEWAF?  
00055:01 A. Correct.  
02 Q. Okay. Prior to the Deepwater  
03 Horizon has a HEWAF ever been utilized as  
04 part of a NRDA?

Page 55:06 to 55:06

00055:06 A. I don't believe so.

Page 57:03 to 57:04

00057:03 Q. Do you know if EPA has ever used  
04 HEWAFs to establish toxicity thresholds?

Page 57:06 to 57:10

00057:06 A. I -- I would have to -- to do a  
07 little research. I don't believe so, but...  
08 Q. (BY MR. ISRAEL) Okay. Do you  
09 know if the EPA has ever used HEWAF to set  
10 water quality standards?

Page 57:15 to 57:19

00057:15 A. No.  
16 Q. (BY MR. ISRAEL) No, you don't  
17 know or no, the EPA has never used a HEWAF  
18 to --  
19 A. EPA --

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00057:22 A. (Continuing) EPA has never used  
23 a HEWAF for a water quality criteria.  
24 Q. (BY MR. ISRAEL) Okay. Has any  
25 regulatory agency ever used a HEWAF to  
00058:01 establish a water quality criteria?

Page 58:09 to 58:10

00058:09 A. I don't believe so.  
10 Q. (BY MR. ISRAEL) Okay.

Page 58:17 to 60:23

00058:17 Q. (BY MR. ISRAEL) If I could ask  
18 you to look at Tab 13, I'm going to mark it  
19 as an Exhibit 11763. Dr. Merten, you have  
20 before you Exhibit 11763, which is an article  
21 from Aquatic Toxicology titled "Exxon Valdez  
22 to Deepwater Horizon: Comparable toxicity of  
23 both crude oils to fish early life stages."  
24 Are you familiar with this paper?  
25 A. I'm aware of this paper.  
00059:01 Q. This is a NOAA study, correct?  
02 A. Yes. And the author is John  
03 Incardona. It's NOAA other examples.  
04 Q. What is his title?

05           A.       I don't know his title, but he's  
06 one of the senior researchers at the  
07 Northwest Fisheries Science Center in  
08 Seattle.

09           Q.       And the data reported in this  
10 paper were created as part of the NOAA NRDA  
11 for the Deepwater Horizon oil spill, correct?

12           A.       I believe some of this study --  
13 some of the data in this paper were from the  
14 Deepwater Horizon NRDA studies, yes.

15           Q.       Have all the data from -- from  
16 this study been produced to BP?

17           A.       I assume. I'll have to look at  
18 the paper for a second.

19                    I believe the data from this  
20 study has been turned over to BP.

21           Q.       If I could ask you to look on  
22 Page 304, in the right column towards the  
23 bottom, the last paragraph. Do you see where  
24 it states, "Water and oil were blended on the  
25 lowest speed"?

00060:01          A.       I'm sorry, can you mark where  
02 you're talking about again?

03           Q.       Yeah. So Page 304.

04           A.       Yeah.

05           Q.       The right column.

06           A.       Okay.

07           Q.       The sentence at the bottom where  
08 it states, "Water and oil were blended on the  
09 lowest speed." Do you see that?

10           A.       Yes.

11           Q.       And it goes on to say 30 s. Do  
12 you understand that to be seconds?

13           A.       Yes.

14           Q.       30 seconds for MC252 riser oil  
15 and 2 minutes for the more viscous surface  
16 slick samples.

17           A.       Yes, I see that.

18           Q.       This is different than the  
19 blending time that we discussed earlier in  
20 the Exhibit 11762, correct?

21           A.       It is.

22           Q.       Do you have any data comparing  
23 the different blending times?

Page 60:25 to 62:16

00060:25          A.       I would have to look into the --  
00061:01 the database and look at -- to see if they've  
02 done this comparison. Off the top of my head  
03 I don't know.

04           Q.       (BY MR. ISRAEL) I'd ask you to  
05 go back to Exhibit 11760, which is Tab 5 and  
06 particularly the Excel spreadsheet printout  
07 of the different toxicity studies.



08 A. Yes.  
09 Q. You're familiar with this  
10 spreadsheet, correct?  
11 A. Yes.  
12 Q. And you see the fifth column,  
13 "Test Substance Mixing Method"?  
14 A. Yes.  
15 Q. And it has a number of studies  
16 that -- where the test substance mixing  
17 method was CEWAF, C-E-W-A-F, correct?  
18 A. Yep, uh-huh.  
19 Q. That's the chemical -- how --  
20 what does that stand for?  
21 A. Chemically enhanced  
22 water-accommodated fraction.  
23 Q. What's the purpose of doing a  
24 chemically enhanced water-accommodated  
25 fraction?  
00062:01 A. They're applying a dispersant to  
02 enhance the mixing.  
03 Q. Why is that? Why was that done?  
04 A. Because dispersants were used in  
05 the Deepwater Horizon.  
06 Q. Okay. And a number of other  
07 studies it references HEWAF. Do you see  
08 those?  
09 A. Yep.  
10 Q. And if you look on test ID 8 --  
11 189, 190, and 191, it references LEWAF,  
12 correct?  
13 A. Yes.  
14 Q. And this is a list of all the  
15 completed toxicity studies, right?  
16 A. Yes. All of the -- yes.

Page 62:22 to 63:15

00062:22 Q. (BY MR. ISRAEL) Is it correct  
23 to say that of the completed toxicity  
24 studies, only three of them utilized LEWAF?  
25 A. Yes.  
00063:01 Q. And were any -- did any of these  
02 studies include comparison of different  
03 methodologies for creating the  
04 water-accommodated fraction?  
05 A. I would have to look at the --  
06 the -- either the QAPP or the GLPP to look at  
07 and see if they have the comparison study.  
08 Q. There is nothing on this table  
09 to indicate that multiple methodologies for  
10 WAF preparation for utilized; is that  
11 correct?  
12 A. We have to look at the test  
13 sheet to -- to say whether -- what -- the  
14 different -- if they used different substance

15 mixing methods.

Page 63:23 to 65:10

00063:23 Q. (BY MR. ISRAEL) Dr. Merten, I  
24 just want to make sure I understand, there is  
25 nothing on this Exhibit 11760 in the Excel  
00064:01 spreadsheet that would indicate whether there  
02 was a comparison of different WAF preparation  
03 methods; is that correct?

04 A. I -- I believe it would be a  
05 comparison, but there are tests that are --  
06 have different mixing methods on the same  
07 organism, same test setup. So you could do a  
08 comparison between those tests.

09 Q. What do -- could you just give  
10 me an example of what you mean?

11 A. Sure. Test 132 and 133, they're  
12 looking at CEWAF and HEWAF on the eastern  
13 oyster, the virgil life stage, and static  
14 96-hour tests.

15 Q. Okay. And are there any  
16 examples on this spreadsheet where you can  
17 determine whether there were comparisons of a  
18 HEWAF with the low-energy WAF?

19 A. Again, you could use those same  
20 tests to compare to the LE- -- the LEWAF on  
21 the oyster. Again, those were all static  
22 96-hour tests, and there is one test, 190 --  
23 oops, that's not the one I'm -- 191 is on the  
24 same life stage. So you could compare the  
25 LEWAF, the CEWAF, and the HEWAF among those

00065:01 tests.

02 Q. Okay. So I can compare test ID  
03 191 with which -- which -- which test?

04 A. You could compare it with 19 --  
05 132 and 130 -- 131 and 132.

06 Q. Okay. So if I wanted to  
07 understand the difference between a LEWAF, a  
08 HEWAF, and a CEWAF to the same organism, same  
09 life stage, I would compare test 191, 131,  
10 and 132?

Page 65:13 to 66:07

00065:13 Q. (BY MR. ISRAEL) And have those  
14 studies from -- the results and data from  
15 tests 189, 190, 191 been provided to BP?

16 A. Yes, I believe everything on  
17 this list has been provided to BP, so, yes.  
18 But let -- I just want to check one thing.

19 Yes.

20 Q. Let me ask you to go back to the  
21 Incardona paper, Exhibit 11763. We were on  
22 Page 304, the second column. We were talking

23 about the -- the blending --  
 24 A. Uh-huh.  
 25 Q. -- of water and oil. Do you  
 00066:01 recall that?  
 02 A. Yes.  
 03 Q. And there was a reference to a  
 04 30-second blending for riser oil and a  
 05 2-minute blending for the more viscous  
 06 surface slick sample. Do you recall that?  
 07 A. Yes.

Page 69:19 to 71:05

00069:19 Dr. Merten, do you have any data  
 20 comparing the -- any HEWAF mixture to the  
 21 conditions in the environment immediately  
 22 below the surface slick?  
 23 A. We have the field data and the  
 24 lab studies that measure HEWAF. So one could  
 25 do those comparisons.  
 00070:01 Q. Was one of the reasons why NOAA  
 02 conducted or utilized a HEWAF because of the  
 03 presence of surface oil?  
 04 A. You are using it for surface and  
 05 subsurface.  
 06 Q. So, yes, one of the reasons was  
 07 because of surface. Why?  
 08 A. Because you're -- there is oil  
 09 on the surface and there is energy in the  
 10 ocean and there -- then you have dispersant  
 11 applied, so you're going to have a  
 12 water-accommodated fraction in the ocean.  
 13 Q. And I believe you testified  
 14 earlier that the chemical-enhanced  
 15 water-accommodated -- accommodated fraction  
 16 was designed to replicate the effect caused  
 17 by dispersants; is that correct?  
 18 A. I would call it approx, yes.  
 19 Q. Okay. Was the high-energy WAF  
 20 used by NOAA designed to replicate the  
 21 conditions caused by energy on the surface of  
 22 the ocean?  
 23 A. Yes, that's the reason why you  
 24 would do the high-energy WAF.  
 25 Q. And what -- are you familiar  
 00071:01 with the Beaufort sea state?  
 02 A. I am.  
 03 Q. What -- what -- what -- what  
 04 Beaufort sea state scale would be consistent  
 05 with the conditions in the -- in the HEWAF?

Page 71:08 to 71:13

00071:08 A. It would be a high sea state.  
 09 I'm just not remembering the Beaufort scale,

10 but it would be -- you would have breaking  
 11 waves, let's put it that way.  
 12 Q. (BY MR. ISRAEL) Would it be  
 13 higher than a 6 on the Beaufort scale?

Page 71:15 to 71:20

00071:15 A. Sir, I cannot remember the  
 16 Beaufort scale, but...  
 17 Q. (BY MR. ISRAEL) But -- but you  
 18 would have to have breaking waves on the  
 19 Beaufort scale in order to have conditions  
 20 that are similar to a HEWAF, correct?

Page 71:22 to 72:07

00071:22 A. You would need energy, high  
 23 energy to create -- in the ocean to be  
 24 similar to a HEWAF; and if you're a small,  
 25 tiny organism, a breaking wave is going to  
 00072:01 create energy that's I would say comparable  
 02 to the -- their HEWAF protocol.  
 03 Q. (BY MR. ISRAEL) Do you know if  
 04 you need large waves in order -- on a  
 05 Beaufort sea state scale in order to  
 06 replicate conditions that are created in a  
 07 HEWAF?

Page 72:09 to 72:17

00072:09 A. You -- you would need breaking  
 10 waves. You would need waves that will --  
 11 breaking the slick, creating this nat- --  
 12 natural dispersion, which will produce  
 13 droplets of oil in the top surface of the --  
 14 the water column.  
 15 Q. (BY MR. ISRAEL) Would you need  
 16 the conditions that include common white  
 17 caps?

Page 72:20 to 72:21

00072:20 A. I think white caps would get you  
 21 there.

Page 72:24 to 74:06

00072:24 Are you aware of any -- any data  
 25 comparing the -- the HEWAF mixtures conducted  
 00073:01 by NOAA to various sea states on the Beaufort  
 02 scale?  
 03 A. I am not aware of specific data  
 04 where people are making those comparisons.

05 Q. Okay. I'd like to mark Exhibit  
06 11764, which is Tab 14. This is an article  
07 titled "Deepwater Horizon crude oil impacts  
08 the developing hearts of large predatory  
09 pelagic fish." Are you familiar with this  
10 study?  
11 A. I'm aware of the study.  
12 Q. Is this a NOAA study?  
13 A. Yes. And John Incardona is the  
14 lead author.  
15 Q. Has the data underlying this  
16 study been produced to BP?  
17 A. Yes, I believe that the  
18 underlying data would have been provided to  
19 BP.  
20 Q. And if you look on Page 2 of  
21 this study, second column, the sentence  
22 immediately above the results.  
23 A. Uh-huh.  
24 Q. Embryos were exposed to  
25 high-energy water-accommodated fractions that  
00074:01 generated PAH concentrations and  
02 compositional profiles closely matching water  
03 samples collected during active MC252 crude  
04 oil release phase. Did I read that  
05 correctly?  
06 A. Yes.

Page 74:23 to 76:07

00074:23 Q. (BY MR. ISRAEL) Are you aware  
24 of any data -- any other data that support  
25 the author's statement that the HEWAF  
00075:01 concentrations and compositional profiles  
02 match water samples collected during the  
03 MC252 crude oil release?  
04 A. I have not done any comparison,  
05 so -- neither field -- numerous field data  
06 and the numerous lab studies that  
07 characterize the HEWAF, so people could make  
08 those comparisons.  
09 Q. If you look on Figure 1, it  
10 shows field -- the HEWAF concentrations of  
11 8.5 parts per billion, 3.4 parts per billion,  
12 and 13.8 parts per billion for total PAHs; is  
13 that correct?  
14 A. Correct.  
15 Q. Do you know what percentage of  
16 the offshore water samples collected during  
17 the Deepwater Horizon oil spill NRDA had  
18 concentrations that are comparable to those  
19 samples?  
20 A. I have -- I haven't looked at  
21 the data like that.  
22 Q. Do you have any data relate --

23 do you have any data -- strike that.  
24 You see the authors state that  
25 in the description of Figure 1, second  
00076:01 sentence, water samples shown are  
02 representative of 78 samples collected during  
03 May through July 2010?  
04 A. I see that, yes.  
05 Q. And you're familiar with NOAA's  
06 data of water column samples, correct?  
07 A. Correct.

Page 77:05 to 77:11

00077:05 Q. What are tricyclate PAHs?  
06 A. They're hydrocarbons that have  
07 three benzene rings attached in -- in one  
08 compound.  
09 Q. Do you have any data indicating  
10 the significance of tricyclate PAHs as  
11 compared to other PAHs?

Page 77:13 to 77:18

00077:13 A. There are published studies that  
14 look at the different contributions and  
15 toxicity of.  
16 Q. (BY MR. ISRAEL) There is -- so  
17 there is a different contribution in toxicity  
18 associated with the tricyclate PAHs?

Page 77:20 to 77:22

00077:20 A. The lower molecular weight  
21 compounds are going to be more available to  
22 the organism.

Page 78:15 to 80:22

00078:15 Q. (BY MR. ISRAEL) Dr. Merten, do  
16 you have any data indicating what percentage  
17 of the field samples collected as part of the  
18 Deepwater Horizon NRDA have compositions of  
19 tricyclate PAHs that are comparable to the  
20 HEWAFs on Table 1, Figure 1?  
21 A. The data are available. They're  
22 all analyzed for PAHs for this entire suite.  
23 So one could look at the data produced.  
24 Q. Do you -- do you know what  
25 percentage of field samples have com- --  
00079:01 compositions of tricyclate PAHs that are  
02 comparable to the HEWAFs in Figure 1?  
03 A. I don't have a percentage. I  
04 would have to go through the data and develop

05 a percentage.

06 Q. Okay. Let me ask you to look at

07 exhibit that we're marking as 11765, Tab 15

08 in your binder. This is a study titled

09 "Crude Oil Impairs Cardiac

10 Excitation-Contraction Coupling in Fish."

11 Are you familiar with this study?

12 A. I'm aware of this study.

13 Q. Is this a NOAA study?

14 A. There are two NOAA PIs on it,

15 and there are -- other PIs are from Stanford,

16 so...

17 Q. Is the underlying data collected

18 as part of the cooperative NRDA?

19 A. I would have to refer to their

20 work plan to know if it was cooperative or

21 not.

22 Q. Do you know if the underlying

23 data was collected as part of the Deepwater

24 Horizon NRDA?

25 A. Yes.

00080:01 Q. Okay. Are you aware of any

02 other studies on fish cardiac cells?

03 A. I am aware of the studies that

04 are in the -- that are in the toxicity

05 database, and I believe that -- I believe

06 these studies -- the data for these

07 studies -- the underlying data for these

08 studies are available.

09 Q. Other than the data underlying

10 the study that has been marked as

11 Exhibit 11765, are you aware of any other

12 studies conducted by NOAA as part of its

13 environmental investigation of the Deepwater

14 Horizon spill on fish cardiac cells?

15 A. No.

16 Q. Are you aware of any studies

17 done by anybody on fish cardiac cells?

18 A. The studies I'm aware of are the

19 studies out of Barbara Block's lab.

20 Q. Prior to the Deepwater Horizon

21 has NOAA, to your knowledge, ever conducted a

22 study on fish heart cells?

Page 80:24 to 82:05

00080:24 A. Incardona and Scholz looked at

25 cardiac effect of PAHs on zebrafish, I

00081:01 believe, but not in -- not in the -- or not

02 using the method that's described here. In

03 their prior work.

04 Q. (BY MR. ISRAEL) Okay. Other

05 than that, you're not aware of any?

06 A. No.

07 Q. Okay. On Page 773, next page,

08 Figure 1 the authors reference a -- an  
 09 exposure of 4 to 61 parts per billion of PAHs  
 10 to fish heart cells; is that correct?  
 11 A. I'm sorry, could you repeat your  
 12 question one more time?  
 13 Q. Yes. Figure 1.  
 14 A. Uh-huh.  
 15 Q. Indicates that the authors are  
 16 exposing fish heart cells to oil  
 17 concentrations ranging from 4 to 61 parts per  
 18 billion; is that correct?  
 19 A. That's correct.  
 20 Q. Let's just take the -- the low  
 21 end of that range at 4 parts per billion,  
 22 okay?  
 23 A. Okay.  
 24 Q. Do you have any data indicating  
 25 how much oil whole fish would need to be  
 00082:01 exposed to in order to achieve an exposure of  
 02 4 parts per billion to fish heart cells?  
 03 A. I would have to do the  
 04 calculation.  
 05 Q. How would you do that?

Page 82:08 to 83:17

00082:08 A. You would dilute your stock  
 09 solution to 4 parts per billion and expose it  
 10 to the cell in a Petri dish or however  
 11 they're doing that. So I guess I'm not  
 12 understanding your question.  
 13 Q. (BY MR. ISRAEL) Okay. I'm  
 14 asking if you have any data indicating how  
 15 much oil whole fish would need to be ex- --  
 16 A. Oh, I'm sorry.  
 17 Q. -- would need -- I'll repeat the  
 18 question. Do you have any data indicating  
 19 how much oil whole fish would need to be  
 20 exposed to in order to achieve an exposure of  
 21 4 parts per billion to fish heart cells?  
 22 A. Not as -- I would have to do the  
 23 whole back-calculation from the target tissue  
 24 in the blood to -- go back to the exposure,  
 25 and I'm not going to be able to do that  
 00083:01 sitting here, and that's not my expertise.  
 02 Q. Okay. Do you have any data that  
 03 indicate how much oil a whole fish would have  
 04 to be exposed to in order to achieve an  
 05 exposure of 4 parts per billion to fish heart  
 06 cells?  
 07 A. I would have to -- I would have  
 08 to dig through the studies to come -- to look  
 09 at the data. I don't know what -- I mean, I  
 10 haven't read this paper. And I would have to  
 11 look at the database to see if they have



12 whole body exposures and -- and analyses.  
13 Q. You're not aware of any data  
14 that indicates the amount of oil whole fish  
15 would need to be exposed to in order to  
16 achieve an exposure of 4 parts per billion to  
17 fish heart cells, correct?

Page 83:19 to 84:01

00083:19 Q. (BY MR. ISRAEL) You're not  
20 aware of any?  
21 A. I would have to look through the  
22 data to -- to be -- to be able to really  
23 answer that question.  
24 Q. Sitting here today, are you  
25 aware of any?  
00084:01 A. No.

Page 84:03 to 85:03

00084:03 Q. (BY MR. ISRAEL) Okay. Are you  
04 aware of any data that show how much oil a  
05 fish embryo would need to be exposed to in  
06 order to achieve exposure of 4 parts per  
07 billion to fish heart cells?  
08 A. Again, I would have to look  
09 through the -- the data to -- and to see how  
10 they would make that link.  
11 Q. Sitting here today, are you  
12 aware of any data that show --  
13 A. I don't --  
14 Q. -- how much oil a fish embryo  
15 would have to be exposed to in order to  
16 achieve an exposure of 4 parts per billion to  
17 fish heart cells?  
18 A. I'm aware of data where fish  
19 embryos were exposed to oil.  
20 Q. Did those data indicate the  
21 amount of exposure to a fish embryo that  
22 would be necessary in order to achieve an  
23 exposure of 4 parts per billion to fish heart  
24 cells, to your knowledge?  
25 A. Well, IF you get 4 parts per  
00085:01 billion through the membrane. You could  
02 approximate that 4 parts per billion were  
03 impacting heart cells.

Page 85:13 to 85:18

00085:13 Q. (BY MR. ISRAEL) You stated that  
14 if you get 4 parts per billion of total PAHs  
15 through the fish embryo membrane, that you  
16 could approximate that 4 parts per billion  
17 were exposed to the heart cell. Is that your

18 testimony?

Page 85:20 to 85:22

00085:20 A. Yes, that's my testimony.  
21 Q. (BY MR. ISRAEL) What do you  
22 base that on?

Page 85:25 to 86:06

00085:25 A. I was basing it on my -- some  
00086:01 experience on PAH and bioavailability to  
02 embryos.  
03 Q. (BY MR. ISRAEL) Is it -- am I  
04 understanding you correctly to mean that the  
05 heart cell is exposed to the same  
06 concentration as the fish embryo?

Page 86:08 to 86:18

00086:08 A. Not early life stage. Again, I  
09 would say it's a good model. An appropriate  
10 model.  
11 Q. (BY MR. ISRAEL) But you don't  
12 know -- it's a model?  
13 A. I'm relying on a mental model,  
14 so I'm not relying on data.  
15 Q. Okay. So you don't -- you don't  
16 know if an embryo is exposed to a certain  
17 concentration of PAHs, that the heart cells  
18 are also exposed to that concentration?

Page 86:22 to 87:12

00086:22 A. Correct.  
23 Q. You don't have data that  
24 demonstrate that the exposure to the heart  
25 cells is the same as the exposure to the  
00087:01 embryo, correct?  
02 A. Correct.  
03 Q. Okay. Do you know if the  
04 exposure to the -- the study that we're  
05 talking about, Exhibit 7 -- 11765 was --  
06 utilized a HEWAF?  
07 A. I -- I would have to go through  
08 the study and look at that. I don't know off  
09 the top of my head. They're saying WAF.  
10 Q. If this -- the authors of this  
11 study utilized a HEWAF, would the exposure  
12 include droplets?

Page 87:15 to 87:18

00087:15 Q. (BY MR. ISRAEL) Would the  
16 exposure to the heart cell, fish heart cell  
17 include droplets?  
18 A. It could include small droplets.

Page 90:14 to 96:15

00090:14 Q. If I could ask you to -- to look  
15 at Tab 16. I'm going to mark Tab 16 as  
16 Exhibit 11766. This is a study by Mager, et  
17 al., titled "Acute Embryonic Or Juvenile  
18 Exposure to Deepwater Horizon Crude Oil and  
19 Compares the Swimming Performance of  
20 Mahi-Mahi." Are you familiar with this  
21 study?

22 A. I'm familiar with the -- the  
23 species, and I haven't re- -- I haven't read  
24 this paper.

25 Q. Are you familiar with the data  
00091:01 underlying this study?

02 A. Yes.

03 Q. This is -- this is data that was  
04 collected as part of the Deepwater Horizon  
05 NRDA?

06 A. Yes.

07 Q. And the data underlying this  
08 study had been produced by the United States  
09 to BP; is that correct?

10 A. Correct.

11 Q. Are the data underlying this  
12 study available to the public, do you know?

13 A. The contaminant chemistry data  
14 are available to the public. The  
15 underlying -- some of the underlying data I  
16 don't believe has been posted publicly, other  
17 than through a -- a published paper.

18 Q. And this is -- this relates to a  
19 toxicity study conducted on Mahi-Mahi,  
20 correct?

21 A. Yes.

22 Q. It includes John Incardona as  
23 one of the authors, correct?

24 A. Correct.

25 Q. He's with NOAA?

00092:01 A. John Incardona and Nat Scholz or  
02 Nathaniel Scholz here are NOAA employees.

03 Q. Do you have any other data  
04 related to Mahi-Mahi in the Gulf of Mexico  
05 collected as part of the Deepwater Horizon  
06 environmental investigation?

07 A. The Mahi-Mahi toxicity studies  
08 are in that list. I would have -- or in  
09 the -- the bin sheets and the electronic data  
10 and photos have been provided --

11 Q. Other --

12 A. -- to BP. Sorry, I just want to  
13 make a distinction between BP and the public,  
14 so...  
15 Q. Okay. Other than the toxicity  
16 studies, do you -- is there any data that has  
17 been collected as part of the NRDA of  
18 Mahi-Mahi in the Gulf of Mexico?  
19 A. Mahi-Mahi? There is some  
20 telemetry studies. I am not recalling if  
21 Mahi-Mahi were one of the species that were  
22 tagged.  
23 Q. Okay.  
24 A. But you have access to the Gulf  
25 Top database and should be able to look at  
00093:01 that.  
02 Q. Were there any studies of --  
03 designed to ascertain whether there was a  
04 population impact to Mahi-Mahi in the Gulf of  
05 Mexico from the Deepwater Horizon oil spill?  
06 A. I would -- again, I'd have to  
07 check the list, but I don't -- I'm not  
08 remembering if Mahi-Mahi were specifically  
09 captured in some of the fish studies that  
10 were conducted to look at population effects.  
11 Q. Are you referring to --  
12 A. I'd have to refer to the work  
13 plans to see which species were collected.  
14 Q. And you're referring to the  
15 telemetry work plans?  
16 A. The telemetry as well as some of  
17 the water column work plans. They would have  
18 been looking at early life stages of  
19 Mahi-Mahi. I just don't remember -- I mean,  
20 they have several species that they were --  
21 they were looking at.  
22 Q. Are you referring to plankton  
23 studies?  
24 A. The plankton studies would be  
25 the first place to -- to start.  
00094:01 Q. What is a plankton study?  
02 A. Plankton study are looking at  
03 various small organisms in the water column,  
04 from phytoplankton to small fish.  
05 Q. And are the results of the  
06 plankton studies conducted as part of the  
07 Deepwater Horizon NRDA available?  
08 A. They are.  
09 Q. Where are they?  
10 A. They're on the [noaanrda.org](http://noaanrda.org)  
11 website and I believe they have been provided  
12 under discovery and the work plans that we're  
13 talking about were cooperative. So they  
14 would have a BP signature along with them.  
15 Q. Did you collect ichthyoplankton  
16 in the Gulf of Mexico?  
17 A. Yes.

18 Q. What are ichthyoplankton?  
 19 A. They are plankton -- fish  
 20 plankton, specifically. So it's a subclass  
 21 of plankton.  
 22 Q. Are ichthyoplankton fish larva?  
 23 A. Yes. Eggs or larvae.  
 24 Q. Egg or larvae.  
 25 A. Yes. Something that's a fish,  
 00095:01 is going to be a fish, but it's moved with  
 02 the currents versus moving by itself.  
 03 Q. What did you do with the larvae,  
 04 the fish larvae and eggs that were collected?  
 05 A. I'd have to look at the work  
 06 plans specifically, but in general there were  
 07 a series of cruises that did a variety of  
 08 plankton tows. So looking at that size class  
 09 and then enumerate -- enumerating the  
 10 plankton in the nets as well as preserving  
 11 them and looking at the type of -- type of  
 12 species, things of that nature. But to be  
 13 more specific of what they were, we'd have to  
 14 refer to the plans in terms of biomass and  
 15 things like that.  
 16 Q. Are ichthyoplankton transparent?  
 17 A. Some of them would be. I'm not  
 18 sure I could say that they all are.  
 19 Q. Did you look at any  
 20 morphological data related to the  
 21 ichthyoplankton that you collected as part of  
 22 the Deepwater Horizon NRDA?  
 23 A. I'd have to refer to the  
 24 specific work plan. I believe that they --  
 25 they did look at that, but I would have to  
 00096:01 look at the plans.  
 02 Q. What is -- what do you  
 03 understand morphological data to be?  
 04 A. To me that would be a better  
 05 characterization of what exact life stage  
 06 that that plankton was in.  
 07 Q. Are you aware of any effort to  
 08 observe the heart of the ichthyoplankton that  
 09 were collected as part of the Deepwater  
 10 Horizon NRDA?  
 11 A. I would have to refer to the  
 12 work plan to see if the field collected  
 13 plankton and the plankton were -- so the --  
 14 if their heart was studied in any way, either  
 15 morphological or functioning.

Page 96:18 to 98:08

00096:18 Do you have any data reflecting  
 19 the observation of -- of heart size in  
 20 ichthyoplankton collected as part of the  
 21 Deepwater Horizon NRDA?

22 A. Well, we discussed that toxicity  
 23 studies. I'd have to refer to probably  
 24 Table 2 in the subsequent plan to determine  
 25 if that was looked at for -- under those  
 00097:01 plans.  
 02 Q. So independent of the toxicity  
 03 studies, you'd have to look at Table 2 in  
 04 order to determine whether you have any data  
 05 of observations of heart size of  
 06 ichthyoplankton collected as part of the  
 07 NRDA?  
 08 A. Yes.  
 09 Q. So Table 2 is in Exhibit 11759,  
 10 and in your binder it's Tab 6. If you could  
 11 take a minute to look at that and tell me  
 12 whether you have any data of observation of  
 13 heart size of ichthyoplankton collected as  
 14 part of the Deepwater Horizon NRDA.  
 15 A. So I can't tell from the  
 16 Table 2. The plans that we would want to  
 17 look -- look at are the plankton processing  
 18 plans, so 247, 295, and 309. And some of the  
 19 underlying data for the ichthyoplankton plans  
 20 in particular have not been delivered. It  
 21 looks like we are promising to deliver it  
 22 before August 15th of 2014, but we could at  
 23 least see in that plan whether that was a --  
 24 they were looking at --  
 25 Q. Sitting here today --  
 00098:01 A. -- heart size.  
 02 Q. Sorry.  
 03 A. Sorry, go ahead.  
 04 Q. Sitting here today, are you  
 05 aware of any observations of heart size of  
 06 ichthyoplankton collected as part of the  
 07 Deepwater Horizon NRDA?  
 08 A. No.

Page 102:19 to 102:19

00102:19 Tab 30. We'll mark this as Exhibit 11768.

Page 103:24 to 104:17

00103:24 Q. (BY MR. ISRAEL) And National  
 25 Marine Fisheries Service is a --  
 00104:01 A. It's part of NOAA.  
 02 Q. Part of NOAA, thank you.  
 03 If you could look on Page 49,  
 04 there is a discussion of the Deepwater  
 05 Horizon oil spill. Do you see that?  
 06 A. Yes.  
 07 Q. And the NOAA authors state in  
 08 that section that -- they discuss the percent  
 09 reduction of yearlings. Do you see that?

10 A. Yes.  
11 Q. And Page 50, the NOAA authors  
12 state that they regarded a 20 percent  
13 reduction of Atlantic bluefin tuna yearlings  
14 to be a reasonable upper bound for the  
15 mortality of bluefin tuna larvae, owing to  
16 the spill event. Do you see that?  
17 A. I do.

Page 106:06 to 106:21

00106:06 Q. So do you have any data of  
07 1-year-old tuna?  
08 A. We would have to go through the  
09 water column studies and look at the  
10 particular studies to look and see if it...  
11 Q. I think I asked you to look to  
12 the paragraph on Page 50 that begins "In  
13 summary..." Do you see that?  
14 A. Yes.  
15 Q. Can you read that sentence?  
16 A. "In summary, independent  
17 projections of two different types of models  
18 show that a 20 percent reduction in 2010  
19 year-class will likely result in less than a  
20 4 percent reduction in future spawning  
21 biomass."

Page 107:09 to 108:20

00107:09 Q. (BY MR. ISRAEL) Do you have any  
10 data that would be relevant to the  
11 determination of the percent reduction in  
12 future spawning biomass that would result in  
13 a percent reduction of a particular  
14 year-class?  
15 A. The data would have been  
16 collected on the water -- water column  
17 technical working group, and it would be --  
18 we would have to look at the particular plans  
19 to know if those -- if that data set exists.  
20 Q. Which data set?  
21 A. You asked about bluefin tuna  
22 less than a year old, and the percent  
23 reduction in future spawning biomass aspect  
24 would be an interpretation of that -- of  
25 those data.  
00108:01 Q. Do you know if you have any data  
02 that would allow somebody to interpret or  
03 determine the accuracy of NOAA's statement on  
04 Page 50?  
05 A. You have to use the same data  
06 sets to make that -- that prediction.  
07 Q. Do you know if anyone has done  
08 that?

09 A. Outside of this group here?  
 10 Q. Yes.  
 11 A. I'm not aware of anyone who has  
 12 done that, but it doesn't mean they haven't  
 13 done it.  
 14 Q. So outside of the -- the NOAA  
 15 investigation that's reflected on  
 16 Exhibit 11768, you're not aware of any  
 17 analysis of the -- of the potential reduction  
 18 in tuna spawning biomass, correct?  
 19 A. Correct, that's not my focus  
 20 area.

Page 108:25 to 109:05

00108:25 Q. (BY MR. ISRAEL) Sitting here  
 00109:01 today, are you aware of any data that's  
 02 inconsistent with NOAA's conclusion on  
 03 Exhibit 11768?  
 04 A. I'm just aware of the data  
 05 that's been collected under these plans.

Page 109:20 to 110:09

00109:20 telemetry work plan, which is Tab 32 in your  
 21 binder. We'll mark it as 11769. This is a  
 22 work plan that provides for tagging of  
 23 Atlantic bluefin tuna during the 2011 tagging  
 24 season; is that correct?  
 25 A. Correct.  
 00110:01 Q. What was the purpose of this  
 02 study?  
 03 A. So they're looking -- they're  
 04 using electronic tags of Atlantic bluefin  
 05 tuna to better idea the uti- -- habitat  
 06 utilization in the Gulf of Mexico.  
 07 Q. And was this study part of the  
 08 cooperative NRDA?  
 09 A. It was.

Page 110:16 to 111:17

00110:16 Q. (BY MR. ISRAEL) How -- and tuna  
 17 were tagged, correct?  
 18 A. Tuna were tagged, yes.  
 19 Q. How many of those tagged tuna  
 20 survived?  
 21 A. We would have to look in the --  
 22 Q. Do you know?  
 23 A. -- the database. I don't know  
 24 off the top of my head, no.  
 25 Q. Do you have any reason to  
 00111:01 believe that the data collected pursuant to  
 02 this work plan is not reliable?



03           A.       I have no reason to doubt the  
 04 data collected. It was collected by the  
 05 experts in the field.  
 06           Q.       Okay. Other than this work  
 07 plan, do you have any other data related  
 08 to -- to tuna collected as part of the  
 09 Deepwater Horizon NRDA?  
 10           A.       This -- it would be in the  
 11 telemetry area, which you're looking at right  
 12 here; it would be in the water column and the  
 13 toxicity area; and I think we've covered all  
 14 of those.  
 15           Q.       Any others?  
 16           A.       Not that I can think of right  
 17 now.

Page 114:03 to 116:11

00114:03           Q.       I'll ask you to look at Tab 17,  
 04 which is Exhibit 11770. This is a report,  
 05 2013 report entitled "Assessing the Impacts  
 06 of the Deepwater Horizon Oil Spill: The  
 07 National Status and Trends Program Response."  
 08 Are you familiar with this report?  
 09           A.       I'm familiar with the -- the  
 10 team and the -- and the protocol.  
 11           Q.       Where are the -- are you  
 12 familiar with the data underlying this  
 13 report?  
 14           A.       I'm if familiar with the data  
 15 that -- that they -- have been posted.  
 16           Q.       When you say that have been  
 17 posted, is that the data underlying this  
 18 report, the data -- is that a data set that  
 19 was collected as part of the NRDA?  
 20           A.       No, this would have been  
 21 collected outside of NRDA, as part of just --  
 22 as part of the program, the national status  
 23 and trends program, which I believe is why it  
 24 doesn't have a formal work plan number.  
 25           Q.       But this is a data set that  
 00115:01 you're prepared to -- to testify to today,  
 02 correct?  
 03           A.       Correct.  
 04           Q.       This is the data reflected in  
 05 rows 315 to 320 of Exhibit 11759?  
 06           A.       Yes.  
 07           Q.       And this, among other things, is  
 08 looking at the concentration of PAHs in  
 09 sediments; is that correct? Look on Page 5.  
 10           A.       I believe that is correct. Let  
 11 me --  
 12           Q.       And is that --  
 13           A.       Yes.  
 14           Q.       Statement that "Post-landfall

15 measurements are comparable to measurements  
 16 in the region of 2006/2007." Do you see  
 17 that?  
 18 A. I see that, yes.  
 19 Q. This is reflecting the data sets  
 20 that you are prepared to testify to today,  
 21 correct?  
 22 A. Correct.  
 23 Q. Do you see where it -- do you  
 24 see the next bullet, "Based on the overall  
 25 magnitude"?  
 00116:01 A. Yep.  
 02 Q. Could you read that, please?  
 03 A. "Based on the overall magnitude  
 04 of total PAHs, there is no conclusive  
 05 evidence of increase in Gulf-wide PAH coastal  
 06 sediment contamination from the Deepwater  
 07 Horizon oil spill at Mussel Watch sites."  
 08 Q. Okay. That's based upon the  
 09 data that was collected and is reflected in  
 10 Table 2, Lines 315 to 320, correct?  
 11 A. Correct.

Page 116:20 to 117:11

00116:20 Q. (BY MR. ISRAEL) Page -- Page 6.  
 21 If I could ask you to turn to Page 6. This  
 22 is a description of the large-scale findings  
 23 of PAHs in oysters. Do you see that?  
 24 A. Yep.  
 25 Q. And the second bullet, could you  
 00117:01 read that first sentence, please?  
 02 A. "Based on the overall magnitude  
 03 of total PAHs in oyster tissues, there is no  
 04 conclusive evidence of an increase in tissue  
 05 burden of oysters from Mussel Watch sites  
 06 around the coastline of the Gulf of Mexico  
 07 following the Deepwater Horizon oil spill."  
 08 Q. And this is based upon the --  
 09 the NOAA data that you've provided in this  
 10 proceeding, correct?  
 11 A. For the mussel watch data.

Page 118:20 to 121:17

00118:20 Q. Do you have tissue samples of  
 21 oysters collected as part of the NRDA and the  
 22 Deepwater Horizon that show PAHs in oyster,  
 23 oysters?  
 24 A. Yes, we have tissue samples of  
 25 oysters collected on -- for the NRDA.  
 00119:01 Q. Do they show -- what do they  
 02 indicate with respect to PAHs?  
 03 A. I haven't analyzed them. I  
 04 haven't analyzed the data set. The data

05 exists. I have not -- as the data manager  
06 have not done the analysis part.  
07 Q. And that data would be the data  
08 that's been provided to BP, correct?  
09 A. Correct.  
10 Q. Are there any other data  
11 reflecting PAHs in oyster tissues other than  
12 the data that's been provided to BP?  
13 A. I don't believe so.  
14 Q. Okay.  
15 A. The only caveat to that is if  
16 there are newly collected oyster tissue from  
17 this field season that have not been analyzed  
18 and validated and provided to any of us.  
19 Q. About how many samples do you  
20 have of oyster tissue?  
21 A. I would have to look at the --  
22 the database. You know, I would say  
23 thousands versus a hundred, but, you know,  
24 I -- I would have to pull it through the  
25 data.  
00120:01 Q. Okay. Do any of those samples  
02 indicate PAHs above background?  
03 A. Again, I haven't analyzed those  
04 data sets against any thresholds.  
05 Q. Have those samples been  
06 fingerprinted?  
07 A. I believe there have been some  
08 oyster samples that have been fingerprinted.  
09 Q. When you say "fingerprinted,"  
10 what do you mean?  
11 A. I -- I -- when I say foren- --  
12 or "fingerprinted," I mean that an expert  
13 forensic chemist has looked at the PAH  
14 pattern along with some of the bio markers of  
15 the -- that are recalcitrant in oil to  
16 term- -- to make an interpretation of source.  
17 Q. And it's your understanding that  
18 the oyster tissue samples have been  
19 fingerprinted for that -- for the purpose you  
20 just described?  
21 A. Yes.  
22 Q. And are those results posted on  
23 ERMA?  
24 A. I believe they're in ERMA as  
25 well as NOAA dot -- noaanrda.org.  
00121:01 Q. So it's your testimony that the  
02 results of the oyster fingerprinting analysis  
03 are available to BP?  
04 A. Yes.  
05 Q. Are the results of the -- of  
06 NOAA's fingerprinting analysis available in  
07 the public section of ERMA?  
08 A. I don't believe so.  
09 Q. Why not?  
10 A. I probably should look at ERMA

11 to make sure that was an accurate statement.  
 12 I -- I actually think that the fingerprinting  
 13 analysis is part of an expert report and has  
 14 not been finished at this point and so hasn't  
 15 been released to the public. I would have to  
 16 look at ERMA to see. We just released the  
 17 data, though.

Page 123:04 to 123:15

00123:04 Q. Okay. And the fingerprinting of  
 05 PAHs in oyster tissue that we were  
 06 discussing, has that been conducted on the  
 07 entire data set of oyster tissue samples?  
 08 A. I don't know if it's been  
 09 conducted on an entire data set or a subset.  
 10 Q. Do you know if it's been the  
 11 majority of the oyster tissue samples?  
 12 A. Yeah, I don't know if I could  
 13 say a majority.  
 14 Q. Okay.  
 15 A. A representative sample.

Page 125:23 to 129:07

00125:23 Q. (BY MR. ISRAEL) Dr. Merten, can  
 24 we have an understanding that when I  
 25 reference Table 2, we're talking about --  
 00126:01 unless otherwise indicated, we're talking  
 02 about the table entitled "Status of United  
 03 States' Production of NRDA Data in Penalty  
 04 Phase," which is part of Exhibit 11759?  
 05 A. Sure.  
 06 Q. So if you look at Table 2,  
 07 line -- Lines 159 through 181. It's a number  
 08 of work plans and data sets related to  
 09 dolphin health assessment. Do you see that?  
 10 A. I do.  
 11 Q. And you're prepared today to  
 12 testify about the dolphin health assessment?  
 13 A. Yes.  
 14 Q. Okay. I'd ask you to look at  
 15 Tab 77, which is -- we're going to mark as  
 16 11771, and it's entitled "Assessing Potential  
 17 Sublethal and Chronic Health Impacts from the  
 18 Mississippi Canyon 252 Oil Spill on Estuarine  
 19 Bottlenose Dolphins." Do you see that?  
 20 A. I'm sorry, which tab was that?  
 21 Q. 77.  
 22 MR. O'ROURKE: It's the other book.  
 23 A. Okay, yes.  
 24 Q. (BY MR. ISRAEL) Are you  
 25 familiar with this work plan?  
 00127:01 A. I am.  
 02 Q. And it was prepared by a

03 Dr. Lori Schwacke. Do you see that?  
04 A. Yes.  
05 Q. Who was she?  
06 A. She was a NOAA employee with the  
07 National Center For Coastal Ocean Science,  
08 and she's in Charleston at the Hollings  
09 Marine Laboratory.  
10 Q. And she's a principal  
11 investigator along with Dr. Teri Rowles and  
12 Eric Zolman; is that correct?  
13 A. Correct.  
14 Q. And who is Dr. Teri Rowles?  
15 A. Dr. Rowles is in Silver Spring  
16 at the National Marine Fisheries Service  
17 Office of Protected Resources.  
18 Q. And this is a -- this is a  
19 NOAA -- this is -- this is a work plan  
20 conducted as part of the NRDA of the  
21 Deepwater Horizon oil spill, correct?  
22 A. Correct.  
23 Q. Was this a cooperative work  
24 plan?  
25 A. Yes, it was cooperative.  
00128:01 Q. Okay. And if I could ask you to  
02 turn to Page 4. There is a section entitled  
03 "Methods and Operations." Do you see that?  
04 A. Yes.  
05 Q. And the second paragraph, it  
06 states: "Sarasota Bay, Florida was chosen as  
07 a reference site because it is a Gulf of  
08 Mexico site that was not subject to visible  
09 oiling." Do you see that?  
10 A. Yes.  
11 Q. What is a reference site?  
12 A. A reference site is an area that  
13 you're using as your control in the field,  
14 that you're going to compare your site that  
15 you feel is contaminated or different, but  
16 you want to know -- be able to compare it  
17 back to something that you feel is  
18 representative of background or  
19 uncontaminated areas.  
20 Q. So the control or reference site  
21 is similar with the exception of the  
22 contamination?  
23 A. Yes, it has similar  
24 characteristics, similar habitat types;  
25 similar water temperature, salinity; sim- --  
00129:01 similar organisms in it, yes.  
02 Q. And a study of dolphins that you  
03 would expect -- or you would select a ref- --  
04 a reference location where the population was  
05 similar to the area of concern; is that  
06 correct?  
07 A. Correct.

Page 129:09 to 132:03

00129:09 Q. (BY MR. ISRAEL) Do you have  
10 data that indicated that the Sarasota Bay  
11 dolphin population is similar to the  
12 Barataria Bay dolphin population?  
13 A. We have data on the Sarasota  
14 dolphins as well as the other -- the  
15 Barataria Bay and I don't remember the other  
16 location, but you would have to do the  
17 comparison of the similarities and  
18 differences.  
19 Q. Okay. The other location was  
20 Mississippi Sound?  
21 A. Right.  
22 Q. So there were studies done of  
23 Barataria Bay dolphin population, Mississippi  
24 Sound population using a Sarasota Bay  
25 population as a reference site; is that  
00130:01 right?  
02 A. That's correct.  
03 Q. And dolphin health assessment  
04 involves capturing live dolphins in nets; is  
05 that correct?  
06 A. Correct.  
07 Q. Scientists using multiple --  
08 multiple boats would -- would work as teams  
09 to corral dolphins into a net, correct?  
10 A. Yes.  
11 Q. And then they would bring the  
12 dolphin on board in order to examine the  
13 dolphin, correct?  
14 A. I believe sometimes they bring  
15 them on board, sometimes they work with them  
16 in the water in a shallow area.  
17 Q. What would distinguish when the  
18 scientists would bring the dolphin on board  
19 the boat versus conduct their examination in  
20 the water?  
21 A. I don't know their criteria that  
22 they have.  
23 Q. Were dol- -- were there exam- --  
24 are there situations or circumstances where a  
25 dolphin is not brought on board because it's  
00131:01 pregnant?  
02 A. I would have to refer to their  
03 methods.  
04 Q. If you could look on Page 6 of  
05 Exhibit 11771, the paragraph that begins,  
06 "Health evaluation..." Do you see that?  
07 A. Page 6. Yes.  
08 Q. Do you see where it states for  
09 females an ultrasound examination will be  
10 conducted to assess potential pregnancy.  
11 Pregnant animals will not be taken aboard --

12 A. Yeah.  
 13 Q. So it's correct to say that  
 14 dolphins that were found to be pregnant were  
 15 not examined on board?  
 16 A. Correct.  
 17 Q. Similarly, if the scientists  
 18 felt that the examination on the vessel would  
 19 jeopardize the health of the dolphin, those  
 20 dolphins were not brought on board, correct?  
 21 A. Correct.  
 22 Q. And is it true that this type of  
 23 health assessment of dolphins has been going  
 24 on in Sarasota Bay for decades?  
 25 A. I believe that's the case, yes.  
 00132:01 Q. Isn't it true that the Sarasota  
 02 Bay dolphin population is one of the best  
 03 studied dolphin populations in the world?

Page 132:05 to 132:09

00132:05 A. Yeah, I don't know if that's a  
 06 true statement or not.  
 07 Q. (BY MR. ISRAEL) Isn't it true  
 08 that most of the dolphins in Sarasota Bay are  
 09 known to researchers?

Page 132:12 to 132:24

00132:12 A. Yeah, again, I don't know if  
 13 that's a standard reference site.  
 14 Q. (BY MR. ISRAEL) If you look on  
 15 Page 6, the next paragraph. After the  
 16 paragraph we read earlier, do you see the  
 17 paragraph that begins "Complete  
 18 examination..." Do you see that?  
 19 A. Yes.  
 20 Q. It references "Most dolphins in  
 21 Sarasota Bay are of known age because they  
 22 have been followed since birth." Do you see  
 23 that?  
 24 A. Yes.

Page 133:04 to 133:06

00133:04 Q. (BY MR. ISRAEL) Do you have any  
 05 reason to believe that's not correct?  
 06 A. No.

Page 133:23 to 134:16

00133:23 Q. Prior to the Deepwater Horizon  
 24 NRDA is it correct to say that there were no  
 25 health assessments of the dolphin population

00134:01 at Barataria Bay?  
 02 A. I would feel that I would need  
 03 to go back and look and see where the  
 04 dolphins were studied prior to the Deepwater  
 05 Horizon.  
 06 Q. Are you aware of any health  
 07 assessments of the dolphin population in  
 08 Barataria Bay prior to the Deepwater Horizon?  
 09 A. I don't know of the locations  
 10 where they were studying dolphin populations.  
 11 I know that they were monitoring dolphins  
 12 prior to Deepwater Horizon.  
 13 Q. And when you say "they," who are  
 14 you referring to?  
 15 A. I'm referring to the National  
 16 Marine Fisheries Service.

Page 134:23 to 138:01

00134:23 Q. Do you have any knowledge of any  
 24 health assessments similar to the health  
 25 assessment that is described in Exhibit 11771  
 00135:01 as part of the NRDA that were done before the  
 02 Deepwater Horizon of Barataria Bay dolphins?  
 03 Are you aware of any?  
 04 A. I'm -- the only -- the work I'm  
 05 aware of is the unusual mortality events that  
 06 they -- that have -- that Fisheries have been  
 07 monitoring over time, and I just -- I don't  
 08 recall if Barataria Bay is one of their study  
 09 sites or not prior to Deepwater Horizon.  
 10 Q. And the investigation related to  
 11 unusual mortality events, did that include to  
 12 the health assessment protocol that's  
 13 described in the work plan Exhibit 11771?  
 14 A. I -- I believe that some of the  
 15 protocol were applied as part of the UME  
 16 work, but I would have to go back and -- and  
 17 review that --  
 18 Q. Okay.  
 19 A. -- to make that statement.  
 20 Q. Are you -- okay. Are you aware  
 21 prior to the Deepwater Horizon of any  
 22 investigation of the health of dolphins  
 23 that -- in Barataria Bay that involved  
 24 capturing dolphins and doing an on-board  
 25 examination?  
 00136:01 A. Again, I'd have to refer back to  
 02 what -- the protocols they used prior to  
 03 Deepwater Horizon to know whether or not  
 04 that's true or not.  
 05 Q. I'm just asking you if you're  
 06 aware of any.  
 07 A. I'm not aware of anything.  
 08 Q. Okay. And the health assessment



09 as part of the NOAA -- as -- strike that.  
 10 The health assessment done as  
 11 part of the Deepwater Horizon NRDA also  
 12 included an evaluation of the dolphin  
 13 population in Mississippi Sound, correct?  
 14 A. Yes.  
 15 Q. Are you aware of any health  
 16 assessment of the dolphin population in  
 17 Mississippi Sound prior to the Deepwater  
 18 Horizon oil spill?  
 19 A. Again, the studies I'm familiar  
 20 with are Gulf of Mexico versus a specific  
 21 location. I just don't recall knowing if  
 22 there was a specific location that they  
 23 studied for the -- the UMEs or if it was --  
 24 they stud- -- they went -- they recorded  
 25 those events. But it's my understanding they  
 00137:01 did it in a more global way than in specific  
 02 loca- -- bays.  
 03 Q. And the studies that you're  
 04 recalling, do they involve capturing live  
 05 dolphins and examining them on a vessel?  
 06 A. The studies I'm recalling are  
 07 more focused on the stranding data.  
 08 Q. Okay. And going back to  
 09 Barataria Bay, how did researchers select the  
 10 animals they were going to study?  
 11 A. Yeah, I'm not sure.  
 12 Q. They -- isn't it correct that  
 13 they studied dolphins that they were able to  
 14 catch?  
 15 A. Yes.  
 16 Q. Okay. And that -- isn't it true  
 17 that some dolphins attempted to escape nets?  
 18 A. I'm sure that's true.  
 19 Q. Isn't it true, but --  
 20 A. I don't know.  
 21 Q. Sorry?  
 22 A. I'm sure that is true, but I --  
 23 I'm not aware.  
 24 Q. Isn't it true that healthy  
 25 dolphins would have been the most difficult  
 00138:01 to catch?

Page 138:03 to 138:05

00138:03 A. Again, not knowing a lot about  
 04 dolphins, I would say that might be true.  
 05 They -- yeah, that could be true.

Page 138:24 to 139:01

00138:24 Q. (BY MR. ISRAEL) You do agree  
 25 that sick or a weakened dolphin would be the  
 00139:01 easiest dolphin to catch?

Page 139:03 to 141:05

00139:03 A. Yes.  
04 Q. (BY MR. ISRAEL) So I'd like to  
05 ask you to look at Tab 80. This is a  
06 study -- and I'm going to mark this as  
07 Exhibit 11772. This is a paper entitled  
08 Health of Common Bottlenose Dolphins in  
09 Barataria Bay, Louisiana Following the  
10 Deepwater Horizon Spill by Dr. Schwacke, et  
11 al. Are you familiar with this paper?  
12 A. Yes.  
13 Q. And you agree that the data  
14 underlying this study were the data that were  
15 collected as part of the Deepwater Horizon  
16 NRDA?  
17 A. Yes.  
18 Q. Of the data that -- that  
19 Dr. Schwacke and her colleagues report in --  
20 this paper, Exhibit 11772, have those data  
21 been validated?  
22 A. Of the data in this paper the  
23 marine mammal group was responsible for the  
24 non-contaminant chemistry, they would have  
25 been responsible to develop rules to validate  
00140:01 their data, and one of the -- one of those  
02 rules is that by publishing data through the  
03 peer-review process, you're publish --  
04 you're -- you're providing validated data.  
05 Q. Okay. So therefore because this  
06 data set has been the subject of a  
07 publication, it's -- it's correct to say  
08 that, by definition, the underlying data has  
09 been validated, correct?  
10 A. Yes.  
11 Q. Okay. If I could ask you to  
12 look at Figure 1. Figure 1 identifies  
13 dolphins by their freeze brand number,  
14 correct?  
15 A. I'm sorry, you said it  
16 "identifies dolphins by"?  
17 Q. By their freeze brand  
18 identifier; is that correct?  
19 A. Yes.  
20 Q. What is a freeze brand  
21 identifier?  
22 A. I have to say I don't know  
23 exactly what that is. I have -- it's a way  
24 that they're -- they're labeling dolphins,  
25 that they are tracking individuals.  
00141:01 Q. If you look on Page 6 of the  
02 work plan that we were looking at before,  
03 Tab 1176 -- excuse me, Exhibit 11771, the  
04 paragraph that begins, "The complete

05 examination..." Do you see that?

Page 141:11 to 142:18

00141:11 Tab 77. It's the paragraph that reads, "The  
 12 complete examination..." Do you see that?  
 13 A. Yes.  
 14 Q. And then the third sentence --  
 15 or the third line down, "Each dolphin will be  
 16 photographed and branded with a 3-digit  
 17 alphanumeric code on either side of its  
 18 dorsal brand." Do you see that?  
 19 A. Yes.  
 20 Q. Is that freeze brand identifier?  
 21 Is that what that means?  
 22 A. That's how I would interpret  
 23 that.  
 24 Q. Okay. If we can go back to  
 25 Tab 80, Exhibit 11772, Figure 1. Figure 1  
 00142:01 shows the mass-to-length relationship of  
 02 dolphins in Barataria Bay compared to  
 03 dolphins in Sarasota Bay, correct?  
 04 A. Correct.  
 05 Q. And the -- the top figure is for  
 06 male dolphins and the bottom figure is for  
 07 female dolphins, correct?  
 08 A. Correct.  
 09 Q. And the blue circles represent  
 10 dolphins in Sarasota Bay, and the red circles  
 11 represent dolphins in Barataria Bay, correct?  
 12 A. Correct.  
 13 Q. And Dr. Schwacke and her  
 14 colleagues have labeled those dolphins using  
 15 the freeze brand identifiers for individuals  
 16 with a mass-length relationship below the 2.5  
 17 percentile, correct?  
 18 A. Correct.

Page 143:01 to 149:05

00143:01 on the -- above the figure, it says "Physical  
 02 Examination." Do you see that?  
 03 A. Yes.  
 04 Q. And Dr. Schwacke states, Five of  
 05 20 dolphins in BB, Barataria Bay, were  
 06 classified as significantly underweight. Do  
 07 you see that?  
 08 A. I do.  
 09 Q. And that's the -- I'm sorry?  
 10 A. Okay, yes, I do. I see that.  
 11 Q. And those five dolphins are the  
 12 dolphins that are identified by their freeze  
 13 brand marking in Figure 1, correct?  
 14 A. Correct.  
 15 Q. So for -- for male dolphins

16 those would be dolphins Y00, Y12, Y16, and  
17 Y08, correct?  
18 A. Yes.  
19 Q. And then for females that would  
20 be dolphin Y05, correct?  
21 A. Yes.  
22 Q. Dr. Schwacke identifies those  
23 five dolphins in Baratataria Bay as  
24 significantly underweight, correct?  
25 A. Correct.  
00144:01 Q. With respect to the methodology  
02 of the underlying study and the work plan  
03 that we discussed in Exhibit 11771, is it  
04 your understanding that the NOAA scientists  
05 completed field forms each time they captured  
06 a dolphin?  
07 A. Correct.  
08 Q. Do you have any reason to  
09 believe that the forms completed in the field  
10 as part of NOAA's dolphin health assessment  
11 were completed inaccurately?  
12 A. I have no reason to think that,  
13 no.  
14 Q. To the best of your  
15 understanding, those forms were filled out  
16 accurately, correct?  
17 A. They were filled out accurately.  
18 Q. Okay. So if I could ask you to  
19 look at Tab 81, and we're going to mark  
20 Tab 81 as Exhibit 11773. Do you know what  
21 this is, Exhibit 11773?  
22 A. This is a field sampling form  
23 for the plan that we're talking about, for  
24 the NRDA plan.  
00145:01 Q. For the -- for the NOAA dolphin  
02 health assessment plan?  
03 A. Yes.  
04 Q. And the first form is for  
05 dolphin Y00, correct?  
06 A. Correct.  
07 Q. And you know that because on the  
08 top right of the first page of Exhibit 11773  
09 there is an indication that says "FB" and  
10 it's in that box is written the notation  
11 "Y00," correct?  
12 A. Yes, and it's also written below  
13 under "Captured individual."  
14 Q. Okay. This is one of the  
15 dolphins that Dr. Schwacke characterized as  
16 significantly underweight, correct?  
17 A. Correct.  
18 Q. If I could ask you to turn to  
19 the third page of these field notes where it  
20 says physical exam. Do you see that?  
21 A. I do.  
22 Q. And do you see where No. 2,

22 "Body condition index," do you see that?  
23 A. I do.  
24 Q. What was the body condition of  
25 dolphin Y00?  
00146:01 A. They checked ideal, No. 3, the 3  
02 index.  
03 Q. So it's not indicated he's  
04 underweight, correct?  
05 A. Correct.  
06 Q. It's not indicated he's  
07 emaciated, correct?  
08 A. Correct.  
09 Q. You have no reason to believe  
10 that that indication in the field notes for  
11 dolphin Y00 is inaccurate, correct?  
12 A. I have no reason to believe  
13 that, no.  
14 Q. Okay. It was signed by Lori  
15 Schwacke, correct?  
16 A. It was, yeah.  
17 Q. I'd like to ask you to turn to  
18 the field note for dolphin Y08, also part of  
19 Exhibit 117 -- 11773.  
20 A. Yes.  
21 Q. Do you see that?  
22 A. I do.  
23 Q. And Y08 is -- this is also --  
24 these are also field notes for the NOAA NRDA  
25 plan assessing potential sublethal and  
00147:01 chronic impacts on coastal and estuarine  
02 bottlenose dolphin, correct?  
03 A. Correct.  
04 Q. And Y08 is one of the dol- --  
05 one of the dolphins that Dr. Schwacke in her  
06 article identified as significantly  
07 underweight, correct?  
08 A. Correct.  
09 Q. If you look at the body  
10 condition index for Y08, the dolphin was  
11 observed to be ideal weight, correct?  
12 A. Correct.  
13 Q. And this is also signed by Lori  
14 Schwacke, correct?  
15 A. It is, yes.  
16 Q. And you have no reason to  
17 believe that that designation was inaccurate,  
18 correct?  
19 A. I have no reason to believe  
20 that, no.  
21 Q. If you would turn to the next  
22 individual dolphin, also part of  
23 Exhibit 11773, dolphin Y16. Do you see that?  
24 A. I do.  
25 Q. And these are field notes and  
00148:01 observations for dolphin Y16 as part of the  
02 NOAA NRDA plan for assessing the health of

03 dolphins in Baratataria Bay, correct?  
04 A. Correct.  
05 Q. And Y16 is one of the dolphins  
06 that Dr. Schwacke in her publication  
07 characterized as significantly underweight,  
08 correct?  
09 A. Yes.  
10 Q. Okay. If you could look at the  
11 physical exam indication on the third page of  
12 the field notes for dolphin Y16. Do you see  
13 that?  
14 A. I do.  
15 Q. And do you see where the body  
16 condition index for dolphin Y16 is listed as  
17 ideal?  
18 A. I do.  
19 Q. And this is signed by Lori  
20 Schwacke, correct?  
21 A. It is.  
22 Q. You have no reason to believe  
23 that -- that her observation in the field was  
24 inaccurate, correct?  
25 A. Correct.  
00149:01 Q. So three -- at least three of  
02 the five dolphins identified as significantly  
03 underweight in Dr. Schwacke's paper were  
04 observed in the field as to having ideal body  
05 conditions, correct?

Page 149:07 to 149:09

00149:07 A. Correct.  
08 Q. (BY MR. ISRAEL) Is -- is  
09 Baratataria Bay an industrialized water body?

Page 149:12 to 149:17

00149:12 A. There is some industry in  
13 Baratataria Bay, yes.  
14 Q. (BY MR. ISRAEL) And isn't it  
15 true that there have been spills other than  
16 the Deepwater Horizon that have affected  
17 Baratataria Bay?

Page 149:19 to 149:25

00149:19 A. There have been other spills in  
20 Baratataria Bay.  
21 Q. (BY MR. ISRAEL) And isn't it  
22 true that there have been other spills in  
23 Baratataria Bay prior to the dolphin health  
24 assessment that was undertaken by NOAA as  
25 part of the Deepwater Horizon NRDA?

Page 150:02 to 151:10

00150:02 A. Yes, there were spills prior.  
 03 Q. (BY MR. ISRAEL) Do you have any  
 04 data indicating whether there have been oil  
 05 spills in Sarasota Bay?  
 06 A. I am more familiar with  
 07 Baratania Bay, but -- and I would have to  
 08 look at the past spills to be able to answer  
 09 that question.  
 10 Q. I'm just asking if you're aware  
 11 of any data indicating that there have been  
 12 oil spills in Sarasota Bay. Are you aware of  
 13 any?  
 14 A. I'm aware of a national database  
 15 that would show where spills have been  
 16 reported.  
 17 Q. Okay. Sitting here today, are  
 18 you aware of any oil spills in Sarasota Bay?  
 19 A. Not significant ones.  
 20 Q. Going back to Dr. Schwacke's  
 21 article, Exhibit 11772. If I could ask you  
 22 to turn to Page 99. On the left-hand column,  
 23 see the dol- -- the paragraph that begins,  
 24 "BB," Baratania Bay dolphins?  
 25 A. Yes.  
 00151:01 Q. About nine or ten lines down  
 02 there is a sentence that begins, "These  
 03 findings..."  
 04 A. Yes.  
 05 Q. Can you read that sentence,  
 06 please?  
 07 A. I'm sorry. "These findings are  
 08 consistent with low-grade lungworm infection  
 09 and mild verminous pneumonia, which would not  
 10 be unusual in this age class."

Page 152:18 to 153:12

00152:18 Q. On the right-hand column at the  
 19 bottom of the second paragraph do you see  
 20 where it states, about five lines from the  
 21 bottom, "Hepatic enzyme induction..." Do you  
 22 see that?  
 23 A. I do.  
 24 Q. Could you read that?  
 25 A. "Hepatic enzyme induction is  
 00153:01 often observed following xenobiotic exposure  
 02 and can be associated with other chemicals,  
 03 such as POPs."  
 04 Q. What are POPs?  
 05 A. I'm blanking. Organic  
 06 pollutants.  
 07 Q. Persistent organic pollutants.

08 A. Excuse me, thank you.  
09 Persistent organic pollutants and polycyclic  
10 aromatic hydrocarbons, PAHs, which are  
11 consider the most tox- -- most toxic  
12 constituents of oil.

Page 154:08 to 155:04

00154:08 Q. (BY MR. ISRAEL) Do you have any  
09 data related to Dr. Schwacke's conclusion  
10 related to hepatic enzyme induction agents?  
11 A. Yes.  
12 Q. What -- what data is that?  
13 A. There are data -- there are  
14 biopsy chemical analyses on persistent  
15 organic pollutants other than PAHs that was  
16 conducted by the Northwest Fisheries Science  
17 Center, and there are also the enzyme  
18 induction data. I would have to check that  
19 they are actually completed, but I believe  
20 they were also conducted by that same group,  
21 and would give you an indication of exposure  
22 to contaminants, POPs or PAHs.  
23 Q. Do those data indicate hepatic  
24 enzyme induction subsequent to that exposure?  
25 A. Those chemicals induce the --  
00155:01 that receptor, the aryl hydrocarbon receptor.  
02 Q. Okay. Do you know if DDT is a  
03 potential causal factor for hepatotoxicity and  
04 hypoandrenocorticism?

Page 155:06 to 155:25

00155:06 A. DDT would be in this persistent  
07 organic pollutant category and if exposed, is  
08 one of those chemicals that will induce  
09 that -- that enzyme receptor.  
10 Q. (BY MR. ISRAEL) Okay. On  
11 Page 100, do you see the paragraph that  
12 begins, High serum iron concentrations?  
13 A. Yes.  
14 Q. And Dr. Schwacke states, "Given  
15 the potential for genetic influence, the  
16 clinical relevance of the observed elevated  
17 iron measures is unknown." Do you see that?  
18 At the bottom of that paragraph.  
19 A. Oh, at the bottom. Yes, I do  
20 see that.  
21 Q. Do you know what that means?  
22 A. I guess I have an interpretation  
23 of what that means.  
24 Q. What do you understand that  
25 context to mean?



Page 156:02 to 156:25

00156:02           A.       I understand that to mean that  
03 they don't know what the cause of the  
04 elevated iron measures are in this -- given  
05 this test, because of the genetic influence.  
06       Q.       (BY MR. ISRAEL) What does  
07 "genetic influence" mean?  
08       A.       I would -- I would interpret  
09 this as meaning the genetic variability among  
10 individual -- individuals in the population  
11 of the dolphins.  
12       Q.       Okay. Look on the next column  
13 on top of -- on Page 100 still, first  
14 sentence. Do you see that sentence, "We  
15 cannot rule out"?  
16       A.       Yes, "We cannot rule out  
17 infectious behavioral, or nutritional  
18 factors..."  
19       Q.       Could you read the next  
20 sentence, please?  
21       A.       Sire. We cannot rule out  
22 infectious, behavioral, or nutritional  
23 factors as causes of gingival hyperplasia and  
24 extensive tooth loss observed in the  
25 Barataria Bay dolphins.

Page 158:01 to 159:02

00158:01       Q.       Okay. The next paragraph, the  
02 middle of the paragraph she states --  
03 Dr. Schwacke states, "To our knowledge, the  
04 only dolphin abortions currently reported in  
05 the literature are late-term abortions due to  
06 Brucella infection." Do you see that?  
07       A.       Yes.  
08       Q.       Do you have any -- do you  
09 have -- first of all, is Dr. Schwacke, do you  
10 consider an expert on dolphins?  
11       A.       I do.  
12       Q.       Do you expect that she would  
13 know of any information related to dolphin  
14 abortions that you wouldn't be aware of?  
15       A.       She -- yes, she would know  
16 better than I.  
17       Q.       Okay. If you look down at the  
18 paragraph that begins, "Forty-eight percent  
19 of the dolphins..." Do you see that?  
20       A.       Yes.  
21       Q.       And the next -- the first  
22 sentence after -- the second sentence, "Some  
23 level of disease is expected for any wild  
24 population." Do you see that?  
25       A.       I do.  
00159:01       Q.       That's a true statement,

02 correct?

Page 159:04 to 159:05

00159:04 A. I would say that's probably a  
05 true statement.

Page 159:13 to 159:25

00159:13 Q. (BY MR. ISRAEL) Do you have any  
14 data related to the possibility -- related to  
15 the possibility that impacts observed by  
16 Dr. Schwacke to Barataria Bay dolphins were  
17 caused by temperature fluctuations?  
18 A. I don't have any data that would  
19 suggest that, but I -- there are data sets  
20 that are available to look at.  
21 Q. Do you have any data related to  
22 the possibility that the impacts observed by  
23 Dr. Schwacke to Barataria Bay's -- to  
24 Barataria Bay dolphins are caused by  
25 freshwater incursions?

Page 160:03 to 160:20

00160:03 A. Again, I haven't made any  
04 interpretations of the marine mammal data.  
05 Q. (BY MR. ISRAEL) Do you have any  
06 data related to the potential relationship  
07 between freshwater and the dolphin population  
08 of Barataria Bay?  
09 A. The data from the health  
10 assessment, and we have data on water  
11 temperature and salinity.  
12 Q. Any other data?  
13 A. There is other data associated  
14 with Barataria Bay, but specifically related  
15 to your question, that's all I'm recalling at  
16 the moment.  
17 Q. Okay. Do you know if  
18 Dr. Schwacke accounted for potential  
19 differences between Barataria Bay and  
20 Sarasota Bay related to water quality?

Page 160:22 to 161:08

00160:22 A. I don't -- I don't know other  
23 than that they were measuring water quality  
24 elements associated with -- when they're  
25 capturing dolphins, so, again, temperature  
00161:01 and salinity. They might be measuring  
02 dissolved oxygen. I'm not sure. I'd have to  
03 go back and look at that.

04 Q. (BY MR. ISRAEL) Do you know if  
 05 Dr. Schwacke accounted for potential  
 06 differences between the industrial and  
 07 commercial activities surrounding Barataria  
 08 Bay and Sarasota Bay?

Page 161:10 to 162:12

00161:10 A. I don't know.  
 11 Q. (BY MR. ISRAEL) Okay. If I  
 12 could ask you to look on Page 98, that's  
 13 going back. It is on Exhibit 11773 -- I'm  
 14 sorry, 11772.  
 15 A. You said on 98?  
 16 Q. Yes.  
 17 A. Oh, page --  
 18 MR. O'ROURKE: Stay in the same tab.  
 19 THE WITNESS: Page 98, yes.  
 20 Q. (BY MR. ISRAEL) I know I said  
 21 98, but I meant to say Page 99.  
 22 A. Oh, okay.  
 23 Q. Sorry about that. If you could  
 24 look at the top sentence of the right-hand  
 25 column, do you see where it states, "The lung  
 00162:01 disease observed in Barataria Bay  
 02 dolphins..."  
 03 A. Yes.  
 04 Q. "...is consistent with  
 05 laboratory studies and clinical reports of  
 06 humans and animals exposed via ingestion,  
 07 inhalation and aspiration to petroleum  
 08 hydrocarbons." Did I read that correctly?  
 09 A. You did.  
 10 Q. How would a dolphin in Barataria  
 11 Bay be exposed to petroleum hydrocarbons via  
 12 ingestion?

Page 162:14 to 163:08

00162:14 A. You could be exposed, just  
 15 direct ingestion. You could be eating  
 16 something that was contaminated with  
 17 hydrocarbons.  
 18 Q. (BY MR. ISRAEL) So when you say  
 19 "eating," are you saying that it would be  
 20 through prey?  
 21 A. Correct.  
 22 Q. Okay. Isn't it true that you  
 23 have collected prey data for dolphins and  
 24 turtles as well as part of the Deepwater  
 25 Horizon NRDA?  
 00163:01 A. I believe that is correct.  
 02 Q. And isn't it true that you have  
 03 analyzed over 60 of those prey samples?  
 04 A. I would have to look at the --

05 the data they display. I know the prey  
06 samples have been analyzed and validated.  
07 Q. And they showed very low  
08 detectible PAHs, correct?

Page 163:10 to 163:14

00163:10 A. I don't know what the specific  
11 data.  
12 Q. (BY MR. ISRAEL) Isn't it true  
13 that NOAA stopped analyzing for PAHs in prey  
14 because the concentrations were so low?

Page 163:16 to 165:12

00163:16 A. I don't know the reason why it  
17 stopped.  
18 Q. (BY MR. ISRAEL) But it's true  
19 that NOAA did stop analyzing prey data,  
20 correct?  
21 A. I believe that's correct, yes.  
22 Q. Do you have any other data  
23 related to potential exposure of dolphins in  
24 Barataria Bay through -- through the food web  
25 other than the data collected as part of the  
00164:01 Deepwater Horizon NRDA?  
02 A. Not that I'm aware of, unless  
03 there is, you know, other researchers out  
04 there conducting studies, but nothing under  
05 the NRDA.  
06 Q. Dr. Schwacke also references  
07 exposure through inhalation?  
08 A. Uh-huh.  
09 Q. Correct?  
10 A. Correct.  
11 Q. Did NOAA collect any air quality  
12 data in dolphins -- in the dolphins'  
13 breathing zone in their assessment of the  
14 Barataria Bay dolphins?  
15 A. I know that air quality data  
16 were collected. I would have to look at the  
17 data set to know where -- where that took  
18 place. It was pretty widespread early in the  
19 spill.  
20 Q. Are you referencing general air  
21 quality data, or are you referencing air  
22 quality data collected as part of the dolphin  
23 health assessment?  
24 A. I'm referencing general air  
25 quality data collected.  
00165:01 Q. There was no air quality data  
02 taken as part of the dolphin health  
03 assessment, correct?  
04 A. In the dolphin health assessment  
05 plan, no, I don't believe so.

06 Q. Okay. Then, finally,  
 07 Dr. Schwacke references aspiration as another  
 08 potential exposure pathway for dolphins. Do  
 09 you see that?  
 10 A. Yes.  
 11 Q. It's true, isn't it, that  
 12 dolphin anatomy precludes aspiration?

Page 165:14 to 166:21

00165:14 A. Yeah, I don't know.  
 15 Q. (BY MR. ISRAEL) Do you know  
 16 what aspiration is?  
 17 A. I think so, yes.  
 18 Q. What is your understanding of  
 19 aspiration?  
 20 A. Where you can't breathe or -- or  
 21 some blockage. So I would see this as more  
 22 of a blockage of their air hole.  
 23 Q. Are you aware of an effort by  
 24 NOAA to mark and recapture dolphins in  
 25 Barataria Bay from 2010 to 2013?  
 00166:01 A. I thought this was -- that was  
 02 part of this study.  
 03 Q. If you'll go back to Table 2 and  
 04 look at Lines 202 and 20 -- strike that.  
 05 As part of this study tens of  
 06 thousands of photographs of dolphins were  
 07 taken, correct?  
 08 A. Yes.  
 09 Q. And researchers compared  
 10 photographs of the dolphins using a database  
 11 called FinBase, correct?  
 12 A. Correct.  
 13 Q. And is it true that there is  
 14 more than 500 new dolphins in Barataria Bay  
 15 were identified in 2010 alone?  
 16 A. I'm not sure about that. I'd  
 17 need to look at the data set.  
 18 Q. And the study and the tracking  
 19 of dolphins would provide important  
 20 information about which dolphins had survived  
 21 year after year, correct?

Page 166:23 to 168:15

00166:23 A. Yes.  
 24 Q. (BY MR. ISRAEL) In fact, using  
 25 these photographs, scientists can track to  
 00167:01 see if the same dolphin was observed in  
 02 Barataria Bay over time, correct?  
 03 A. That's my understanding, yes.  
 04 Q. And you have no reason to doubt  
 05 this data, do you?  
 06 A. No.

07 Q. Scien- -- scientists, to your  
 08 knowledge, conducting the year-over-year  
 09 observations of dolphins in Barataria Bay  
 10 followed standard practices in collecting the  
 11 data, correct?  
 12 A. That's my understanding.  
 13 Q. In addition to the photographs,  
 14 researchers also took biopsy samples of  
 15 dolphin blubber -- blubber, correct?  
 16 A. Correct.  
 17 Q. And those blubber samples were  
 18 analyzed for PAHs, correct?  
 19 A. Correct.  
 20 Q. Isn't it correct that there were  
 21 over 600 tests run on blubber samples? Isn't  
 22 that correct?  
 23 A. I would have to look at the CMA  
 24 tests, but...  
 25 Q. Approximately?  
 00168:01 A. Approximately sounds like in the  
 02 right ballpark there.  
 03 Q. And it would -- isn't it true  
 04 only two of those tests showed detectable  
 05 levels of PAHs?  
 06 A. Again, then I'd have to look at  
 07 the -- the data.  
 08 Q. Does that sound approximately  
 09 correct?  
 10 A. PAHs in blubber, I would -- is  
 11 probably correct.  
 12 Q. Isn't it also correct that NOAA  
 13 decided to discontinue their analysis of PAHs  
 14 in blubber?  
 15 A. That is correct.

Page 171:09 to 172:24

00171:09 Q. Were you aware that as part of  
 10 the Deepwater Horizon NRDA the trustees  
 11 undertook a study of manatees in Florida?  
 12 A. I am aware of the NOAA study of  
 13 manatees.  
 14 Q. And are you prepared to -- to  
 15 testify about the study of manatees in  
 16 Florida?  
 17 A. Well, I thought man- -- manatees  
 18 are not DOI trustees or --  
 19 Q. Yeah. If you look on tab --  
 20 Table 2, which we used reference Table 2 --  
 21 A. Correct.  
 22 Q. -- in Exhibit 11759, Line 146.  
 23 There is a manatee survey that is indicated  
 24 as a NOAA study. Do you see that?  
 25 A. Okay, it's on the DOI study.  
 00172:01 Yes, I see the manatee surveys Florida. And

02 I believe that the data collected was shared  
03 on April 25th of 2011.  
04 Q. And that's -- that's a NOAA  
05 study, correct?  
06 A. Yes.  
07 Q. Okay. And you're prepared to  
08 testify about that study?  
09 A. Yes.  
10 Q. And you're not here to testify  
11 about the manatee studies that were done --  
12 that were indicated here as DOI studies,  
13 correct?  
14 A. Correct.  
15 Q. Okay. The NOAA study involved  
16 conducting aerial transects in 2010 to look  
17 for manatees, correct?  
18 A. Correct.  
19 Q. Isn't it true that not a single  
20 oiled manatee was observed during that study?  
21 A. I have not looked at the data,  
22 but I don't believe manatees were something  
23 that we pursued.  
24 Q. Why is that?

Page 173:01 to 173:08

00173:01 A. I think people -- well, we're in  
02 Florida, for one; and, two, DOI took up the  
03 other studies on manatees.  
04 Q. (BY MR. ISRAEL) What's the  
05 significance of the fact that you were in  
06 Florida?  
07 A. There was less significant  
08 oiling in Florida.

Page 173:20 to 174:18

00173:20 Q. (BY MR. ISRAEL) Okay. I'd like  
21 to go back to Tab 16. We discussed this  
22 earlier this morning. It's Exhibit 11766, a  
23 paper by Dr. Mager. Do you recall?  
24 A. Oh, yes.  
25 Q. This paper -- do you have that,  
00174:01 Tab 16?  
02 A. Yes, I do.  
03 Q. This is the paper titled "Acute  
04 Embryonic or Juvenile Exposure to Deepwater  
05 Horizon Crude Oil Impairs the Swimming  
06 Performance of Mahi-Mahi," correct?  
07 A. Correct.  
08 Q. And John Incardona is one of the  
09 authors?  
10 A. Correct.  
11 Q. This paper does not purport to  
12 indicate one way or another whether there was

13 a population level impact on Mahi-Mahi,  
14 correct? It was a lab study, correct?  
15 A. Yes, it's a -- a lab study.  
16 Q. It doesn't -- doesn't reach any  
17 conclusions about any impact to the  
18 population of Mahi-Mahi in the Gulf, correct?

Page 174:21 to 175:04

00174:21 A. So I haven't read this paper, so  
22 I don't know if they make any judgments or  
23 extrapolations from the lab studies to deal  
24 with studies -- or field implications.  
25 Q. (BY MR. ISRAEL) Do you know if  
00175:01 they compare the concentration ranges that --  
02 concentration range in this study to actual  
03 water samples collected in the Gulf during  
04 the month following the spill?

Page 175:07 to 175:14

00175:07 A. I may need to skim the paper to  
08 be able to answer that question.  
09 Yes, they did make sum  
10 comparisons.  
11 Q. (BY MR. ISRAEL) Did they  
12 compare their -- their results to the entire  
13 NOAA data set of actual water concentrations  
14 in the Gulf?

Page 175:17 to 176:01

00175:17 A. It seems they're comparing the  
18 samples collected at 1 and 10-meter depths.  
19 So, no, they're not looking at the whole  
20 suite of water analyses.  
21 Q. (BY MR. ISRAEL) Isn't it true  
22 that the concentration range that Nager and  
23 Incardona and others use in this study only  
24 seem a small percentage of the water samples  
25 actually collected in the Gulf following the  
00176:01 spill?

Page 176:04 to 177:04

00176:04 A. I don't know the percentages of  
05 the samples that they used in the study.  
06 THE REPORTER: You need to speak up.  
07 A. I don't know the percentages of  
08 these particular samples in terms of the  
09 overall DSS.  
10 Q. (BY MR. ISRAEL) And you agree  
11 that the results reported in this study



12 relied upon a high-energy water-accommodated  
13 fraction method, correct?  
14 A. Yes.  
15 Q. Do you know if the authors  
16 compared the resulting mixture from the  
17 high-energy WAF to actual -- to the actual  
18 composition and concentration of PAHs in the  
19 water collected in the Gulf of Mexico  
20 following the Deepwater Horizon spill?  
21 A. It looks like they compared  
22 concentrations.  
23 Q. But not composition, correct?  
24 A. Composition is not jumping out  
25 at me, no. It looks like they're using --  
00177:01 looking at sum PAHs.  
02 Q. But not all PAHs, correct?  
03 A. Sorry, total PAHs. So s-u-m  
04 versus s-o-m-e.

Page 177:07 to 177:17

00177:07 A. (Continuing) So I was talking  
08 about total PAHs versus a composition of  
09 PAHs.  
10 Q. (BY MR. ISRAEL) Let me ask you  
11 to turn to Tab 50. I'd like to mark as  
12 Exhibit 11774 the "Submerged Oil  
13 Characterization Across Multiple Habitats for  
14 Assessment of Persistent Exposures in  
15 Nearshore Sediments Deepwater Horizon Oil  
16 Spill," work plan 230. Do you see that?  
17 A. I do.

Page 178:17 to 185:03

00178:17 Q. (BY MR. ISRAEL) Okay. Let's  
18 focus on Exhibit 11774, the submerged oil  
19 characterization plan. Are you familiar with  
20 this plan?  
21 A. I'm familiar with it, yes.  
22 Q. It's a NOAA study, correct?  
23 A. Correct.  
24 Q. What was the objective of the  
25 study?  
00179:01 A. To document and quantify this  
02 MC252-related hydrocarbons and other  
03 contaminant levels in the benthic sediments  
04 shallow water habitats.  
05 Q. How are site locations  
06 determined as part of this work plan?  
07 A. I would have to read part of  
08 this to figure out how they determined the  
09 sites.  
10 Q. If you look on the bottom of  
11 Page 3, it references the Shoreline Clean-Up

12 and Assessment Techniques, SCAT,  
13 observations. Do you see that?  
14 A. Okay.  
15 Q. Is that the basis for selecting  
16 study locations as part of the submerged oil  
17 characterization plan?  
18 A. They used it as a starting  
19 point, but they also say that they are  
20 obtaining more intensive sampling design  
21 than -- than the SCAT observations would  
22 have.  
23 Q. And do you know how many sites  
24 were visited as part of this study?  
25 A. No, I'd have to look at the --  
00180:01 the number of sites.  
02 Q. Was a study done as part of the  
03 cooperative agreement?  
04 A. Yes.  
05 Q. And has the data been provided  
06 to BP?  
07 A. Yes.  
08 Q. And do you believe the data from  
09 this study to be reliable?  
10 A. Yes.  
11 Q. Do you believe the data from  
12 this study to be accurate?  
13 A. Yes.  
14 Q. Do you have any concerns with  
15 the data collected from this study?  
16 A. No, I don't.  
17 Q. Do you know how many oil mats  
18 were observed as part of this study?  
19 A. No, I'd have to look at the  
20 results to determine that.  
21 Q. Do you have any data other than  
22 the data collected as part of the submerged  
23 oil characterization plan, Exhibit 11774  
24 related to submerged oil?  
25 A. I agree to submerged oil in the  
00181:01 nearshore.  
02 Submerged aquatic vegetation  
03 studies. All the -- those data have been  
04 entered. I'm not aware of another plan for  
05 the -- for NRDA.  
06 Q. Are you aware of any other data  
07 related to submerged oil besides the plans  
08 you just mentioned?  
09 A. I guess some of the response  
10 data, but we kind of covered it with SCAT.  
11 There was some submerged -- I'm blinking on  
12 the name -- snares or -- they did some  
13 near-shore subsurface oil sampling during the  
14 response, but it's not part of the scope of  
15 the NRDA, so...  
16 Q. Okay. If I could ask you to  
17 look at Tab 51. We're going to mark it as

18 Exhibit 11775, the "Sampling and Monitoring  
 19 Plan for the Assessment of MC252 Oil Impacts  
 20 to Coastal Wetland Vegetation in the Gulf of  
 21 Mexico."  
 22 A. Correct.  
 23 Q. Are you familiar with that plan?  
 24 A. I'm familiar with this plan.  
 25 Q. Was this an -- this was a NOAA  
 00182:01 study, correct?  
 02 A. Yes.  
 03 Q. This was -- this was a part of  
 04 the cooperative with NRDA, correct?  
 05 A. Correct.  
 06 Q. What is the purpose of this  
 07 study?  
 08 A. They state three objectives, to  
 09 collect and evaluate ephemeral and other data  
 10 that will assist in the evaluation and  
 11 assessment of potential effects of MC252 oil  
 12 on predaceous coastal wetland vegetation  
 13 health and then design and implementation of  
 14 additional assessment activities; to collect  
 15 and evaluate ephemeral and other data that  
 16 will assist in the design and implementation  
 17 of other assessment activities related to  
 18 Louisiana, black mangroves; and to provide  
 19 data to assist in design and implementation  
 20 of other activities that may need to be  
 21 characterized and assess physical and  
 22 chemical characteristics of soil and  
 23 sediments, including contaminants insofar as  
 24 they relate to MC252.  
 25 Q. And are you familiar with  
 00183:01 adden- -- various addendum to the coastal  
 02 wetland vegetation studies conducted by NOAA?  
 03 A. Yes, I'm aware there are  
 04 addenda.  
 05 Q. What was the -- what was the  
 06 purpose of those? Was it to take similar  
 07 data over time? Is that your understanding?  
 08 A. In relation to the coastal  
 09 wetland vegetation, I would need to look at  
 10 the addenda. In some of the plans the  
 11 addenda were for adding labs to help with lab  
 12 processing. So I don't know if that's the  
 13 case for this plan.  
 14 Q. If you look -- the work plan  
 15 addendum No. 1 is Tab 52. We'll mark that as  
 16 Exhibit 11776. And work plan addenda No. 2  
 17 is Tab 53, and we'll mark that as 11777.  
 18 So isn't it correct that the  
 19 objective of these -- the coastal wetland  
 20 vegetation plan, including the addendum,  
 21 addendum 1 and 2 was to collect data related  
 22 to coastal wetland vegetation over time?  
 23 A. They were collecting data over

24 time, yes.  
 25 Q. So no -- you were assessing the  
 00184:01 oiling conditions in the vegetation in the  
 02 marshes of Louisiana, Mississippi, and  
 03 Alabama beginning in 2010 and then again in  
 04 2011 and 2012, correct?  
 05 A. Correct.  
 06 Q. And you've shared this data with  
 07 BP?  
 08 A. Yes.  
 09 Q. This was part of the cooperative  
 10 NRDA, correct?  
 11 A. Correct.  
 12 Q. And do you believe the data from  
 13 the -- strike that.  
 14 Is it okay -- is it preferred if  
 15 we refer to this collectively as CWVA?  
 16 A. Sure.  
 17 Q. Okay. Is that how you refer to  
 18 them?  
 19 A. Yes.  
 20 Q. Okay. And do you believe the  
 21 data from the CWVA studies to be reliable?  
 22 A. Yes.  
 23 Q. Do you believe the studies from  
 24 the CWVA studies to be accurate?  
 25 A. Yes.  
 00185:01 Q. Do you have any concerns with  
 02 the data collected from the CWVA studies?  
 03 A. I do not.

Page 185:13 to 186:05

00185:13 Q. The selection of sites was based  
 14 initially on SCAT data, correct?  
 15 A. I believe partially.  
 16 Q. What is "SCAT"?  
 17 A. SCAT stands for Shoreline  
 18 Clean-up Assessment Technique.  
 19 Q. And the SCAT data is in ERMA,  
 20 correct?  
 21 A. Yes.  
 22 Q. And you're responsible for  
 23 managing ERMA?  
 24 A. For managing ERMA, yes. I'm not  
 25 responsible for managing the SCAT database.  
 00186:01 Q. Okay. But you've included the  
 02 SCAT data in ERMA, correct?  
 03 A. Correct.  
 04 Q. And in doing so, do you believe  
 05 the SCAT data to be reliable?

Page 186:08 to 186:24

00186:08 A. The SCAT data are reliable in

09 what they're set out to do, but they're  
10 observational -- they have standard protocol,  
11 but they're observational versus consistent  
12 chemical or biological analysis, which is  
13 more what was in line with the either the  
14 rapid assessment or the coastal wetland veg  
15 plan, the CWV plan.

16 Q. (BY MR. ISRAEL) SCAT data is  
17 not chemistry data?

18 A. Correct.

19 Q. But for -- for observational  
20 purposes do you have any reason to believe  
21 the SCAT data -- strike that.

22 Do you have any reason to  
23 believe that the SCAT observations are  
24 unreliable?

Page 187:02 to 187:05

00187:02 A. No.

03 Q. (BY MR. ISRAEL) Do you have any  
04 reason to believe that the SCAT observations  
05 are not accurate?

Page 187:07 to 187:19

00187:07 A. Are not accurate in the same way  
08 a -- a more formal study is, but they're  
09 accurate in -- in the scope of the protocols  
10 of the SCAT technique.

11 Q. (BY MR. ISRAEL) That's not an  
12 issue of accuracy; that's just an issue of  
13 the purpose of the observation, correct?

14 A. Correct.

15 Q. Okay. With respect to the --  
16 the objective of SCAT observations, you have  
17 no reason to believe that the observations  
18 themselves are inaccurate, correct?

19 A. Correct.

Page 189:03 to 189:05

00189:03 Q. Okay. Let's look on Page 9 of  
04 Exhibit 50 -- Tab 50, Exhibit 51 -- Tab 51,  
05 Exhibit 11775.

Page 189:10 to 190:16

00189:10 Q. If you look on the third  
11 paragraph, do you see where it says three?  
12 Third.

13 A. Third paragraph, yes, I see  
14 that.

15 Q. "Third, based on the review of  
 16 SCAT data and quantitative information  
 17 provided by early preassessment observations,  
 18 each possible sampling site will receive an  
 19 oiling extent designation." Correct?  
 20 A. Correct.  
 21 Q. So that oiling extent  
 22 designation ma- -- that you made as part of  
 23 the CWVA studies was based upon SCAT data and  
 24 pre-assessment observations, correct?  
 25 A. Correct.  
 00190:01 Q. And what was the -- what is a  
 02 pre-assessment observation?  
 03 A. Pre-assessment is actually part  
 04 of the NRDA process where it's more of a --  
 05 it's more of a screening assessment, and if  
 06 a -- a full injury assessment is warranted.  
 07 Q. And were pre-assessment  
 08 shoreline studies done as part of the  
 09 cooperative NRDA?  
 10 A. Yes.  
 11 Q. And have those data been  
 12 provided to BP?  
 13 A. I believe they have.  
 14 Q. And do you believe them to be  
 15 accurate?  
 16 A. Yes.

Page 192:03 to 192:17

00192:03 Q. Do you know what a random sample  
 04 is?  
 05 A. Yes.  
 06 Q. What is a random sample?  
 07 A. Within your study area you have  
 08 some algorithm depict a random area where  
 09 you're going to take your sample.  
 10 Q. What's the purpose of taking a  
 11 random sample?  
 12 A. You get -- you -- you take  
 13 random samples to get some idea of  
 14 variability within your study area.  
 15 Q. If you have a random sample, can  
 16 you use that for drawing statistical  
 17 inferences about the area, the study area?

Page 192:19 to 193:05

00192:19 A. If you have enough samples, you  
 20 can run statistical analyses, make  
 21 inferences.  
 22 Q. (BY MR. ISRAEL) If you have a  
 23 random sample?  
 24 A. If you have enough random  
 25 samples. You can't do it with one random

00193:01 sample, no.  
02 Q. Are there other types of  
03 sampling strategies besides random sampling  
04 that you can use to draw statistical  
05 inferences?

Page 193:07 to 193:08

00193:07 A. Yes.  
08 Q. (BY MR. ISRAEL) What are they?

Page 193:10 to 193:17

00193:10 A. So you can do transect sampling.  
11 I'm not recalling some of the other  
12 techniques.  
13 Q. (BY MR. ISRAEL) And is the  
14 objective of random sampling or transect  
15 sampling to create representative -- a  
16 representative collection of data from the  
17 study area?

Page 193:19 to 193:22

00193:19 A. Yes, with any of the sampling  
20 techniques you're looking at trying to come  
21 up with a representation of, in this case  
22 different degrees of oiling or not oiling.

Page 194:23 to 194:24

00194:23 Q. What does bias mean in the  
24 context of statistics?

Page 195:01 to 195:06

00195:01 A. It means that there is a sample  
02 within your sample population that is having  
03 an impact on the overall statistical result.  
04 Q. (BY MR. ISRAEL) In other words,  
05 that it's not representative of all of the  
06 conditions in the study area?

Page 195:09 to 195:09

00195:09 A. Yes.

Page 196:01 to 197:05

00196:01 Q. What is the water column?  
02 A. The water column refers to a

03 technical working group under the cooperative  
 04 assessment that is looking at areas in the  
 05 deeper water column. I don't remember what  
 06 the demarcation is between near-shore and,  
 07 quote, deepwater column, but more blue water  
 08 type studies.  
 09 Q. Independent of the context of  
 10 the Deepwater Horizon NRDA, what does the --  
 11 the phrase water column mean?  
 12 A. Water column refers to the  
 13 surface of the -- of the water at the  
 14 water -- interface to the bottom where the  
 15 sediment is.  
 16 Q. To the seafloor?  
 17 A. The seafloor, yeah.  
 18 Q. How many data collection efforts  
 19 did you undertake for the purpose of  
 20 understanding the chemistry in the water  
 21 column?  
 22 A. There are several different  
 23 studies.  
 24 Q. And those were --  
 25 A. And several different cruises.  
 00197:01 Q. Those were cooperative studies?  
 02 A. They were cooperative studies,  
 03 yes.  
 04 Q. They were funded by BP?  
 05 A. Correct.

Page 199:04 to 204:12

00199:04 Q. Okay. Let me ask you to look at  
 05 Tab 55, which is going to be marked as 11778.  
 06 This is a work plan titled "Water Column  
 07 Injury Ephemeral Data Collections: Cruise  
 08 3." Do you see that?  
 09 A. I do.  
 10 Q. Have you seen this document  
 11 before?  
 12 A. I've seen the document, yes.  
 13 Q. Are you generally familiar with  
 14 the work plan?  
 15 A. Generally, yes.  
 16 Q. It's a NOAA work plan, correct?  
 17 A. Yes.  
 18 Q. And this cruise took place in  
 19 the summer of 2010, correct?  
 20 A. Yes.  
 21 Q. And do you see where -- where  
 22 the objectives of the study plan are  
 23 identified on the first page?  
 24 A. I do.  
 25 Q. And following the enumeration of  
 00200:01 various Items A through E there is a  
 02 paragraph that begins, "The objective..."



03 A. Yep.  
04 Q. And do you see the second  
05 sentence, "More specifically"?  
06 A. Yes.  
07 Q. And could you read that  
08 sentence, please?  
09 A. "The objective is to obtain  
10 surface and subsurface water samples for  
11 water impacted by oil believed to be from the  
12 MS Canyon 252 event for polycyclic aromatic  
13 hydrocarbons (PAHs) and total petroleum  
14 hydrocarbon (TPH) characterization and TPH  
15 fingerprinting."  
16 Q. So -- so the data you collected  
17 as part of this cruise were taken at  
18 locations you thought would contain oil from  
19 the Deepwater Horizon spill, correct?  
20 A. Correct.  
21 Q. And the next sentence, could you  
22 read that as well, samples?  
23 A. "Samples will be collected  
24 opportunistically from areas identified by  
25 the SPECIAL MONITORING OF APPLIED RESPONSE  
00201:01 TECHNOLOGIES (SMART) teams, or other  
02 information sources as being target areas for  
03 the application of aerial dispersant."  
04 Q. What does it mean to say samples  
05 were collected opportunistically?  
06 A. So this is early in the spill.  
07 There was a -- operations were go -- ongoing  
08 right now. So the response operations are  
09 going to take precedent over NRDA sampling.  
10 So it's why I'm using -- where the SMART team  
11 is monitoring dispersant activity to focus  
12 some of their sampling efforts if they can  
13 get into that zone. That's how I interpret  
14 that.  
15 Q. Okay. You testified earlier  
16 just a minute ago that the sample locations  
17 for this cruise were taken at -- were taken  
18 at areas where you thought would contain oil  
19 from the Deepwater Horizon spill, correct?  
20 A. Correct.  
21 Q. And how -- how did you determine  
22 whether you thought oil would be located?  
23 A. Specifically in this cruise how  
24 did they determine --  
25 Q. Go on.  
00202:01 A. Generally they're looking at  
02 where the operations are. They're looking at  
03 trajectories and other observations that are  
04 occurring as part of the response or part of  
05 the NRDA.  
06 Q. Were there models used to help  
07 you determine where you thought oil would be  
08 located in order to take water samples?

09 A. I believe so.  
10 Q. What model?  
11 A. Well, they're using the -- the  
12 NOME model, the general NOAA oil model  
13 environment, which is the government's  
14 trajectory model.  
15 Q. Any other models?  
16 A. And they're probably using  
17 SIMAP, which is a -- a model of -- a similar  
18 model to NOME that's run by -- is ASA,  
19 Applied Sciences Associates. I think they  
20 have been purchased by another company. At  
21 the moment I can't remember their name. But  
22 those are kind of the two models that are  
23 used in spill response in the U.S.  
24 Q. What does "SIMAP" stand for?  
25 A. I don't know if I can recall  
00203:01 that acronym. I can't remember what SIMAP  
02 stands for.  
03 Q. In any event, it's your -- it's  
04 your testimony that NOAA used SIMAP for  
05 purposes of determining along with other  
06 information where to collect for water column  
07 samples?  
08 A. They used the observational  
09 data, some modeling information, some of the  
10 dissolved oxygen information.  
11 Q. Have either their general NOAA  
12 model or SIMAP been provided to BP?  
13 A. The -- all of the trajectories  
14 from NOME have been provided. It's a public  
15 model. All of the algorithms are known.  
16 SIMAP, I'm not sure if SIMAP itself has been  
17 turned over or purchased by BP.  
18 Q. Why -- why did you use two  
19 models?  
20 A. The traject- -- the NOME model  
21 is the -- the official government trajectory,  
22 and it's generally only 2D, so you're just  
23 looking at the surface. SIMAP has a 3D  
24 component to it and is more typically used  
25 more for -- for injury assessment and not  
00204:01 quite -- not in response mode the way that --  
02 that NOME is.  
03 Q. So for purposes of determining  
04 locations for collecting water column  
05 sampling, SIMAP was better for ascertaining  
06 three dimensions; is that your testimony?  
07 A. Yes, SIMAP will give you three  
08 dimensions, where NOME will not.  
09 Q. The third dimension is the depth  
10 water of the water column?  
11 A. Correct.  
12 Q. Do you know how SIMAP works?

Page 204:15 to 205:01

00204:15 A. I know in general principles how  
16 it works. So it's -- it's a more -- a  
17 computer model that has some models for  
18 looking -- uses a hydrodynamic model to drive  
19 oil droplets, oil droplets in the -- in the  
20 modeling sense, not in the oil sense. So it  
21 can move -- has algorithms to move oil around  
22 in surface, subsurface, and it has a ability  
23 to model not just bulk oil, but components of  
24 oil that we've been talking about, PAHs  
25 for -- in particular. It also has components  
00205:01 to it --

Page 205:07 to 205:10

00205:07 A. So it -- so we got the tox- --  
08 toxicological component to it, and it has a  
09 biological component to it. I don't know  
10 quite how to say it sometimes.

Page 205:17 to 210:23

00205:17 Q. (BY MR. ISRAEL) If I could ask  
18 you to turn to Tab 56. This will be marked  
19 as Exhibit 11779. Another water column data  
20 collection work plan. Are you familiar with  
21 this document?  
22 A. Yes, I skimmed it.  
23 Q. It's a NOAA work plan for  
24 collecting water samples?  
25 A. Correct.  
00206:01 Q. And it was part of the  
02 cooperative NRDA?  
03 A. Yes.  
04 Q. And the data from this cruise,  
05 the Jack Fitz 3, has been shared with BP,  
06 correct?  
07 A. Correct.  
08 Q. And if you look on Page 2,  
09 "Locations to be sampled." Do you see that?  
10 A. Yes, I do.  
11 Q. And can you read the first  
12 sentence, please?  
13 A. "Sampling and physical  
14 oceanographic data will be collected at  
15 stations placed in areas of deepwater oil  
16 plumes and surfacing oil from these plumes."  
17 Q. So the data you collected as  
18 part of this cruise were taken from locations  
19 you thought would contain oil from the  
20 Deepwater Horizon oil spill, correct?  
21 A. Correct.  
22 Q. If you'll look at Tab 57. Mark

23 this as 11780. This is another sampling  
24 cruise for the water column; do you see that?  
25 A. Yes.  
00207:01 Q. Are you familiar with this plan?  
02 A. Yes, I've skimmed it.  
03 Q. This is the American Diver and  
04 Ocean Veritas?  
05 A. Correct.  
06 Q. This is a NOAA work plan,  
07 correct?  
08 A. NOAA plan cooperative study.  
09 Q. And the data collected pursuant  
10 to this work plan have been provided to BP,  
11 correct?  
12 A. Correct.  
13 Q. And do you see where it says  
14 "Approach: Adaptive Sampling Strategy"?  
15 A. Yes.  
16 Q. And could you just read that  
17 first sentence, please?  
18 A. "Sampling is focused on specific  
19 areas and times where oil would be expected  
20 to occur."  
21 Q. So the data collected -- that  
22 you collected as part of this cruise were  
23 taken at locations you thought would contain  
24 oil from the Deepwater Horizon spill,  
25 correct?  
00208:01 A. Correct.  
02 Q. In the next sentence it says,  
03 "We have designed an adaptive focused  
04 sampling strategy"?  
05 A. Right.  
06 Q. "Targeting particular portions  
07 of the water column and in areas where the  
08 oil is detected by indirect sensors or  
09 expected based on transport modeling using  
10 measured and/or predicted circulation  
11 patterns and an understanding of oil  
12 transport."  
13 Do you see that?  
14 A. I do.  
15 Q. What does that mean?  
16 A. So the sensors, they're talking  
17 about fluorometers and acoustics. So if  
18 there is any anomaly in those sensors, that  
19 can be a clue to them. Again, they're  
20 talking about the transport modeling, and I  
21 would assume they're talking about SIMAP in  
22 this particular instance. So they're using  
23 some indirect evidence of oiling along with  
24 their expertise in modeling to have an  
25 educated guess on where to sample for oil.  
00209:01 Q. Is this base -- is this educated  
02 guess an estimate of location or depth or  
03 both?

04 A. Both.  
 05 Q. Okay. So first you go to a  
 06 location where you think there would be oil  
 07 from the Deepwater Horizon, and then you use  
 08 adaptive sampling strategies to determine the  
 09 depth at that location where you expect to  
 10 find oil; is that correct?  
 11 A. Correct.  
 12 Q. Okay. Let me ask you to turn to  
 13 Tab 58. We'll mark this as Exhibit 11781.  
 14 This is a plan for adaptive water column  
 15 sampling, the Hos Davis 1 dated August 11,  
 16 2010. Do you see that?  
 17 A. I do.  
 18 Q. Are you familiar with this plan?  
 19 A. Yes.  
 20 Q. This is a NOAA work plan,  
 21 correct?  
 22 A. Correct.  
 23 Q. And this -- the data that were  
 24 collected as part of this plan was provided  
 25 to BP?  
 00210:01 A. I believe so, yes.  
 02 Q. If you look on the Page 2 where  
 03 it says "Adaptive Sampling Strategy."  
 04 A. Yes.  
 05 Q. And can you read that first  
 06 sentence, please?  
 07 A. "Sampling is focused on specific  
 08 areas and times where subsurface oil would be  
 09 expected to occur."  
 10 Q. So the data you collected as  
 11 part of this cruise were taken at locations  
 12 you thought would contain oil from the  
 13 Deepwater Horizon spill, correct?  
 14 A. Yes.  
 15 Q. And it goes on to talk about the  
 16 same adaptive focus sampling strategy we were  
 17 talking about earlier, correct?  
 18 A. Correct.  
 19 Q. So this cruise also finds --  
 20 seeks locations where you believed there  
 21 would be oil as well as depth that you  
 22 believed there would be oil, correct?  
 23 A. Correct.

Page 211:06 to 214:05

00211:06 Q. (BY MR. ISRAEL) I'll ask you to  
 07 look at Tab 59. I'll mark it as  
 08 Exhibit 11782. This is -- are you familiar  
 09 with this document?  
 10 A. No.  
 11 Q. This is another water column  
 12 sampling cruise; is that correct?

13 A. Correct.  
14 Q. And this is part of -- this is a  
15 NOAA work plan, correct?  
16 A. Correct.  
17 Q. Has the data from this work plan  
18 been provided to BP?  
19 A. I believe so.  
20 Q. The data that were collected  
21 as -- yes, I'm sorry?  
22 A. Yes, it has been.  
23 Q. The data collected as part of  
24 this cruise were taken at locations that you  
25 thought would contain oil from the Deepwater  
00212:01 Horizon spill, correct?  
02 A. Correct.  
03 Q. I'd ask you to look at Tab 60,  
04 this is going to be marked as Exhibit 11783.  
05 This is a work plan for the Haas Davis 3. Do  
06 you see that?  
07 A. Yes.  
08 Q. And was this a NOAA work plan?  
09 A. It is.  
10 Q. And the purpose of this work  
11 plan was to collect chemistry samples from  
12 the water column, correct?  
13 A. Correct.  
14 Q. Has the data collected pursuant  
15 to this work plan been provided to BP?  
16 A. Yes.  
17 Q. And the data you collected as  
18 part of this cruise were taken at locations  
19 you thought would contain oil from the  
20 Deepwater Horizon spill, correct?  
21 A. Correct.  
22 Q. I'd ask you to turn to Tab 61.  
23 This is marked as Exhibit 11784. This is  
24 another water column data collection cruise,  
25 correct?  
00213:01 A. Yes.  
02 Q. This is a NOAA work plan; is  
03 that correct?  
04 A. Yes, it is.  
05 Q. It's part of the cooperative  
06 NRDA?  
07 A. Yes.  
08 Q. And has the data collected as  
09 part of this work plan been provided to BP?  
10 A. I believe so.  
11 Q. And you -- you collected -- the  
12 data you collected as part of this work plan,  
13 Exhibit 11784 were taken at locations that  
14 you thought would contain oil from the  
15 Deepwater Horizon spill, correct?  
16 A. Correct.  
17 Q. And if you look -- if you read  
18 the second sentence, "A substantial focus of

19 this cruise will be the utilization of  
20 deep-tow instrumentation to collect real-time  
21 water quality data..." do you see that?  
22 A. I do.  
23 Q. So as with the work plans we  
24 discussed earlier, the objective was not only  
25 to select locations, but also depths where  
00214:01 you expected there to be oil, correct?  
02 A. Correct.  
03 Q. Is it true for all of the water  
04 column sampling cruises the locations and  
05 depths were designed in order to find oil?

Page 214:07 to 216:03

00214:07 Q. (BY MR. ISRAEL) That's correct,  
08 right?  
09 A. The majority of the water column  
10 cruises that were collecting water samples,  
11 yes, were trying to find areas where there  
12 was oil.  
13 Q. Were there any water column  
14 sampling cruises that were seeking locations  
15 other than where you expected to find oil?  
16 A. There may have been.  
17 Q. Which -- are you referring to  
18 plans where water samples were collected  
19 opportunistically?  
20 A. They were -- the majority of the  
21 plans were looking in areas where they  
22 thought the plume had gone.  
23 Q. Are you aware of any water  
24 column sampling plans that were designed to  
25 be representative?  
00215:01 A. Designed to be representative of  
02 the Gulf of Mexico or --  
03 Q. Of the study area.  
04 A. I think they were all designed  
05 to be representative.  
06 Q. Of the areas where you thought  
07 there was oil, correct?  
08 A. Correct.  
09 Q. And you specifically avoided  
10 areas where you didn't expect to see oil,  
11 correct?  
12 A. The focus was on the spill,  
13 correct.  
14 Q. Do you have any reason to  
15 believe that there was oil in the water  
16 column in areas where you didn't test?  
17 A. Could there have been oil in the  
18 water columns where we didn't sample?  
19 Q. No, do you have any reason to  
20 believe that there was oil in the areas in  
21 the water column that you didn't test?

22 A. MC252?  
23 Q. Yes.  
24 A. I think we focused on the -- the  
25 area closer to the well and where they  
00216:01 thought the plume had gone. It doesn't mean  
02 they had -- didn't sample other areas that --  
03 and the plume did not go.

Page 216:21 to 217:02

00216:21 Q. Is it reasonable to expect that  
22 based upon the study designs that we have  
23 looked at today, the water column sampling  
24 study design, that you found the highest  
25 concentrations of oil resulted from the  
00217:01 Deepwater Horizon spill in the Gulf of  
02 Mexico?

Page 217:05 to 217:18

00217:05 A. It would -- the area within the  
06 10 nautical miles, yes, would be the more  
07 likely area that -- to be measuring oil.  
08 Q. (BY MR. ISRAEL) You designed  
09 a -- you designed the water column sampling  
10 cruises to find MC252 oil, correct?  
11 A. Correct.  
12 Q. And you don't have any reason to  
13 believe that you were not successful, do you?  
14 A. No.  
15 Q. Do you have any data to suggest  
16 that the concentration of MC252 oil would be  
17 greater in areas that you didn't look for the  
18 water column?

Page 217:21 to 218:12

00217:21 A. The data we have are the data  
22 that was associated with these work plans.  
23 Since some of the -- some of the samples  
24 aren't going to be always right in the plume,  
25 so there would be areas outside of where  
00218:01 there was MC252. For comparison I...  
02 Q. (BY MR. ISRAEL) But you -- you  
03 used modeling and trajectory maps and  
04 on-board instrumentation to find the oil,  
05 correct?  
06 A. Correct.  
07 Q. Okay.  
08 A. To target their areas of  
09 sampling, yes.  
10 Q. How many water samples do you --  
11 do you have?  
12 A. Thousands.



Page 219:07 to 219:23

00219:07 Q. And if I wanted to understand  
08 how many water chemistry samples exceed 1  
09 part per billion east of Pensacola, NOAA NRDA  
10 would send me to a tool called Query Manager;  
11 is that correct?  
12 A. Correct. Query -- Query Manager  
13 houses all the chemistry data. You could go  
14 to NOAA NRDA, go to a map. It's called  
15 Diver. Draw an area east of Pensacola and  
16 get the samples associated with that quality  
17 on it and then download the data and look  
18 for -- compare the results against whatever  
19 benchmark you're interested in.  
20 Q. Can I use Query Manager to look  
21 at the NOAA's water chemistry sampling  
22 results at various depths?  
23 A. Yes.

Page 220:17 to 220:20

00220:17 Q. (BY MR. ISRAEL) Do you agree  
18 that there is no detectible PAHs resulting  
19 from the Deepwater Horizon spill in the  
20 fed- -- in federal waters after 2010?

Page 220:23 to 221:11

00220:23 Q. (BY MR. ISRAEL) That's correct,  
24 isn't it?  
25 A. Again, I haven't looked at the  
00221:01 data, so I -- I mean, I wouldn't expect there  
02 to be detectible PAHs in the water column  
03 after that point in time.  
04 Q. After 2010?  
05 A. Correct.  
06 Q. And we're talking about PAHs  
07 resulting from the Deepwater Horizon oil  
08 spill, correct?  
09 A. Correct.  
10 Q. There would be PAHs from natural  
11 seeps, correct?

Page 221:14 to 227:04

00221:14 A. You -- there could be other  
15 sources of PAHs in the water column, correct.  
16 Q. (BY MR. ISRAEL) Okay. We  
17 talked for a minute about sediment samples.  
18 Are you familiar with the sediment samples  
19 collected as part of the Deepwater Horizon

20 NRDA?

21 A. Yes.

22 Q. If you'll look quickly at

23 Tab 27, please. This is marked as

24 Exhibit 11785, and it is entitled

25 "July-September 2011 HOS Sweetwater ROV

00222:01 Sediment and Bottom-Water Sampling Cruise."

02 Do you see that?

03 A. I do.

04 Q. Do you recognize this work plan?

05 A. I recognize it, yes. I skimmed

06 this.

07 Q. And this is -- this is one of a

08 number of cooperative data collection work

09 plans focused on sediment, correct?

10 A. Correct.

11 Q. And this is a sampling used from

12 an ROV, correct?

13 A. Correct.

14 Q. What's an ROV?

15 A. It's a remote underwater

16 vehicle, operate -- remotely operated

17 vehicle, so underwater generally.

18 Q. If you'll look on Page 7 of

19 Exhibit 11785. The paragraph begins, "The

20 sampling approach..." Do you see that?

21 A. I do.

22 Q. The last sentence, "The general

23 transect locations have been pre- selected."

24 A. Yeah.

25 Q. Do you know what was the basis

00223:01 for preselecting the transect locations?

02 A. Attachment -- if you refer to

03 Attachment 1, Table 1-3.

04 Q. Where is it?

05 A. I don't see the attachments,

06 so...

07 Q. I'm just asking if you know what

08 the basis was for --

09 A. I don't.

10 Q. Okay. And along with the

11 transect criteria for selecting, those are

12 indicated in the next paragraph, correct?

13 A. Correct.

14 Q. And just going back to the

15 previous sentence, it says, the only activity

16 left to the discretion of the chief

17 scientists will be specific station

18 locations. That's within the transect,

19 correct? Along -- and there was along a

20 transect the chief scientists would have the

21 discretion to determine the specific

22 location?

23 A. Correct.

24 Q. Okay. Who was the chief

25 scientist?

00224:01 A. Mr. Lewis is the lead for this  
02 work group. Oh, sorry. Dave Allen --  
03 Valentine on the HOS Sweetwater 4 and then  
04 Jim Payne on the HOS Sweetwater 6, two  
05 cruises.  
06 Q. Was BP involved in determining  
07 specific locations along the transect?  
08 A. I believe so and the plan was  
09 reviewed by Jody Kubitz from ENTRICS on  
10 behalf of BP and I believe there was a BP rep  
11 on board.  
12 Q. But isn't it -- isn't it true,  
13 if you know, that the specific location along  
14 the transect for conducting sediment sampling  
15 was made by the chief scientist, correct?  
16 A. Correct, ultimately the chief  
17 scientist makes that call.  
18 Q. And Jim Payne was and Dave  
19 Valentine were the chief scientists, correct?  
20 A. Correct.  
21 Q. And those are -- those  
22 individuals are -- work for NOAA, correct?  
23 A. I don't know who Dave Valentine  
24 is. I know who John Payne is a -- a  
25 subcontractor to IEC.

00225:01 Q. Is he con- -- ultimately a  
02 contractor to NOAA?  
03 A. Yes. So it looks like Dave  
04 Valentine works for University of California  
05 Santa Barbara. I just don't know who he is.  
06 Q. And if you look at the criteria  
07 on Page 7 for selecting specific locations  
08 for sediment samples along the transect, it  
09 includes a number of criteria. Do you see  
10 that?  
11 A. Yes.  
12 Q. Soft sediment for coring,  
13 observations of surface floc, et cetera?  
14 A. Right.  
15 Q. Observation of other features or  
16 anomalies, for example, piles of drilling  
17 mud, accumulation of mucus-like oil  
18 agglomerates, et cetera. Do you see that?  
19 A. I do.  
20 Q. Does that mean that the chief  
21 scientist would specifically look for -- with  
22 respect to No. 4, would the chief scientist  
23 look for those anomalies or seek to avoid  
24 those anomalies?  
25 A. I believe they are seeking to --

00226:01 if they see those features or anomalies, that  
02 that would be an area they would want to take  
03 a sample.  
04 Q. They would want to take a  
05 sample?  
06 A. Correct.

07 Q. Why?

08 A. Well, they're -- so piles of  
09 drilling mud, that makes -- that makes sense.  
10 And accumulations of these oil agglomerates  
11 are -- I think they were suspected of being  
12 associated with the Deepwater Horizon.

13 Q. So if the chief scientist,  
14 Mr. -- Dr. Payne is looking for specific  
15 features such as agglomerates or drilling  
16 mud, those samples would not be  
17 representative of sediment -- other sediment  
18 along the transect, correct?

19 A. Correct.

20 Q. Okay. What about tar balls?  
21 Did Dr. Payne seek to sample tar balls when  
22 selecting sample locations of sediment?

23 A. I think if they saw an abundance  
24 of tar balls, that they would take a sample  
25 of it.

00227:01 Q. And if they -- their sample  
02 included a tar ball, it would not be  
03 representative of the sediment surrounding  
04 the tar ball, correct?

Page 227:06 to 229:03

00227:06 A. It would not be representative  
07 of the sediment, that's correct.

08 Q. (BY MR. ISRAEL) I want to ask  
09 you to look at Tab 76, please. We will mark  
10 Tab 76 a document entitled "Image Data  
11 Processing Plan: Holocam" as Exhibit 11786.  
12 Do you see that document?

13 A. I do.

14 Q. And this is a plankton study  
15 plan; is that correct?

16 A. Correct.

17 Q. We earlier today were talking  
18 about plankton, the plankton investigation as  
19 part of the Deepwater Horizon NRDA. Do you  
20 recall that?

21 A. I do.

22 Q. And if I can turn your attention  
23 to Page 6, talks about the specific work --  
24 work tasks?

25 A. Correct.

00228:01 Q. And isn't it correct that the --  
02 this work plan was seeking to collect data  
03 about the abundance and size of various  
04 category of plankton?

05 A. Yes.

06 Q. And there is nothing in this  
07 plan that indicates that you were looking  
08 for -- looking at the organs of plankton,  
09 correct?

10 A. Correct.  
 11 Q. It would be possible to do that,  
 12 correct?  
 13 A. You could look -- I guess you  
 14 could look at organs of zooplankton under a  
 15 microscope.  
 16 Q. And some of the -- some plankton  
 17 are transparent?  
 18 A. Correct.  
 19 Q. You could look at the images of  
 20 those plankton, if you wanted to, correct?  
 21 A. Right.  
 22 Q. And you could look at the -- the  
 23 organs?  
 24 A. Right.  
 25 Q. But this plan doesn't do that,  
 00229:01 correct?  
 02 A. It looks like in general they're  
 03 looking at abundance and size information.

Page 229:21 to 229:21

00229:21 looking at Tab 68 now, Exhibit 11787, this is

Page 230:06 to 232:13

00230:06 Q. And this -- is there any effort  
 07 that NOAA's undertaken now, currently to look  
 08 at the organs of the plankton collected  
 09 pursuant to that work plan?  
 10 A. Not that I can tell from this  
 11 plan or Table 2.  
 12 Q. Are you aware of any?  
 13 A. I'm not aware of any.  
 14 Q. Okay. Tab 68 we were talking  
 15 about this is an additional plankton work  
 16 plan, correct?  
 17 A. Correct.  
 18 Q. And this is a work plan that was  
 19 undertaken by you pursuant to the cooperative  
 20 NRDA, correct?  
 21 A. Correct.  
 22 Q. And if you look on -- and the  
 23 data from this plan has been shared with BP,  
 24 correct?  
 25 A. Correct.  
 00231:01 Q. If you look on Page 9, do you  
 02 see the paragraph right above where it says  
 03 "CTD," "This analysis..." Do you see that?  
 04 A. Page 9.  
 05 Q. Page 9.  
 06 A. Yes, I see that.  
 07 Q. "This analysis will" re- --  
 08 "will results in an estimate of biomass and  
 09 taxonomic composition for each sample."

10 Further analyses can be perform on the  
 11 physical sample to identify organisms to  
 12 species level." Do you see that?  
 13 A. I do.  
 14 Q. Is it your understanding that  
 15 this -- this study plan did not include any  
 16 effort to observe the organs of the sample of  
 17 the plankton?  
 18 A. That is my understanding.  
 19 Q. And these are just two of the  
 20 plankton work plans that were undertaken  
 21 pursuant to the NRDA, correct?  
 22 A. Correct.  
 23 Q. To your knowledge, did any of  
 24 the plankton work plans include observation  
 25 of organs of -- of the plankton collected as  
 00232:01 part of the work -- as part of the study?  
 02 A. Not to my recollection. I'd  
 03 have to look at all the plans, but this is  
 04 more typical of what the plans were looking  
 05 to do.  
 06 Q. And you have images of the  
 07 plankton that were collected pursuant to the  
 08 NOAA's plankton work plans, correct?  
 09 A. Correct.  
 10 Q. Would it be possible today to  
 11 look at those images with respect to the  
 12 transparent plankton in order to observe the  
 13 organs of those organisms?

Page 232:16 to 232:22

00232:16 A. I -- yes, you could go back and  
 17 look at the images or other aspects they  
 18 weren't originally designed.  
 19 Q. (BY MR. ISRAEL) Okay. And  
 20 you're not aware of any effort to do so  
 21 currently, correct?  
 22 A. I'm not.

Page 233:23 to 234:21

00233:23 Q. Okay. Let's move on to plan  
 24 work -- Tab 25, please. This is going to be  
 25 marked as Exhibit 11788, and it's a plan  
 00234:01 called a "Mesophotic Reef Follow-Up Cruise  
 02 Plan." Do you see that?  
 03 A. I do.  
 04 Q. Are you familiar with the plan?  
 05 A. I am.  
 06 Q. And is this a plan that you  
 07 undertook as part of the Deepwater Horizon  
 08 NRDA?  
 09 A. Yes.  
 10 Q. Was this part of the cooperative

11 NRDA?  
 12 A. It was.  
 13 Q. And have the data collected  
 14 pursuant to this work plan been provided to  
 15 BP?  
 16 A. That's what I was just tracking.  
 17 Yes.  
 18 Q. And what are mesophotic reefs?  
 19 A. They are reefs that are in --  
 20 they're not deepwater reefs. They're in the  
 21 middle, kind of middle zone, photic zone.

Page 234:25 to 236:04

00234:25 Q. (BY MR. ISRAEL) And if you look  
 00235:01 on the executive summary on Page 2, do you  
 02 see that?  
 03 A. Yes.  
 04 Q. The second sentence states, The  
 05 two target study (test) reefs, potentially  
 06 within the zone of influence and oil spill,  
 07 were the Alabama Alps Reef and the Roughtongue  
 08 Reef. Do you see that?  
 09 A. I do.  
 10 Q. And then it goes on to say, The  
 11 reference reef, outside the zone of potential  
 12 influence of the oil spill, was the Coral  
 13 Trees Reef located in the West Florida shelf.  
 14 Do you see that?  
 15 A. Yep.  
 16 Q. So the Coral Trees Reef was a  
 17 reference location, correct?  
 18 A. Correct.  
 19 Q. That's an area that you're --  
 20 you don't expect was impacted by the oil  
 21 spill?  
 22 A. Right.  
 23 Q. And were sediments collected at  
 24 the Pinnacle Reef?  
 25 A. Yes.  
 00236:01 Q. They were collected using  
 02 sediment traps; is that correct?  
 03 A. Looking at objective 7 and  
 04 they're using core -- coring device.

Page 238:18 to 239:06

00238:18 Q. What is the data set referenced  
 19 on Line 431 of Table 2?  
 20 A. The corresponding plan is 229  
 21 for the turtles.  
 22 Q. Yeah. Are you familiar with  
 23 that work plan, generally?  
 24 A. General.  
 25 Q. What is it?

00239:01           A.       "Post-release  
           02   monitoring/tracking of turtles injured,  
           03   stranded, or entrapped in the oil spill  
           04   impact area." And I'm showing that the data  
           05   are not applicable and there are no data to  
           06   deliver.

Page 239:13 to 239:20

00239:13           Q.       I'm just asking if you know what  
           14   the -- this is -- this is a tagging of sea  
           15   turtles that were released after being  
           16   rehabilitated, correct?  
           17       A.       Correct.  
           18       Q.       And did the data from that  
           19   effort indicate that the turtles survived for  
           20   years after the spill?

Page 239:23 to 240:01

00239:23           A.       Looks to me like they're not  
           24   doing a long-term tracking of these released  
           25   turtles. That's my interpretation of  
   00240:01   Table 2.

Page 242:14 to 245:18

00242:14           Q.       Let's turn in your binder to  
           15   Tab 22, please. I'll mark this  
           16   Exhibit 11789, a work plan entitled  
           17   "Reconnaissance Survey of Hard-Ground  
           18   Megafauna Communities in the Vicinity of  
           19   Deepwater Horizon Spill Site." Do you see  
           20   that?  
           21       A.       I do.  
           22       Q.       Are you familiar with this  
           23   study?  
           24       A.       Yes.  
           25       Q.       This was a NOAA study, correct?  
   00243:01       A.       Correct.  
           02       Q.       And this was done as part of the  
           03   cooperative NRDA?  
           04       A.       Yes.  
           05       Q.       And has the data from this study  
           06   been provided to BP?  
           07       A.       Turn to Table 2.  
           08               Do you happen to know what the  
           09   work plan was?  
           10       Q.       It's 134.  
           11       A.       Yes, the data had been provided.  
           12       Q.       And the purpose of this -- of  
           13   this plan -- can you describe the purpose of  
           14   this plan, Exhibit 11789?  
           15       A.       They're identifying hard-ground



16 megafauna communities, so deep-sea coral and  
 17 chemosynthetic seep communities near the  
 18 spill site to determine potential impact.

19 Q. And if you look on Page 6, there  
 20 is a "Task 1 - Site Selection." Do you see  
 21 that?

22 A. Yes.

23 Q. And it references 25 sites that  
 24 were potentially supporting deepwater corals?

25 A. Yes.

00244:01 Q. What types of corals were found  
 02 at these sites?

03 A. The type of coral?

04 Q. What -- were corals found at  
 05 these sites?

06 A. I believe there were corals  
 07 found at some of these sites. I can't say if  
 08 they were found at all of them.

09 Q. And the corals found, how large  
 10 of an area does it occupy?

11 A. I don't know. I'd have to look  
 12 at the -- the print of the -- of the area.

13 Q. Typically do corals fully cover  
 14 an area?

15 A. I would say they're patchy. Not  
 16 particularly this kind of coral.

17 Q. Have you evaluated any potential  
 18 impacts to deepwater coral from the -- from  
 19 the oil spill?

20 A. No, I haven't evaluated any  
 21 impacts.

22 Q. Have there been any subsequent  
 23 monitoring of deepwater coral since this  
 24 study?

25 A. I believe there were follow-up  
 00245:01 studies. This was an early October 2010  
 02 study. I believe there were other  
 03 cooperative studies that went back these  
 04 sites. I'd have to look through the work  
 05 plans to come up with that.

06 Q. That was -- was that a 2013  
 07 study, 311?

08 A. Correct.

09 Q. And that was to revisit two  
 10 sites, correct?

11 A. I'd have to refer to that plan  
 12 to look at -- that plan in the next tab.

13 Q. Do you know -- do you know why  
 14 the NOAA would -- would go back to revisit  
 15 particular locations?

16 A. This is really an example of  
 17 looking at habitats impacted from the spill  
 18 over time.

00260:06 Q. Okay. Could I ask you to turn  
 07 to Tab 85, please? This is a pod cast called  
 08 "Diving Deeper," dated April 7, 2010, marked  
 09 as Exhibit 11791 and reflects an interview.  
 10 Do you recall doing an interview at Kate  
 11 Nielson?  
 12 A. I do.  
 13 Q. Have you read this pod cast?  
 14 A. I have not read the transcript.  
 15 I've heard it, probably very close to when it  
 16 was published.  
 17 Q. Do you recall doing this  
 18 interview?  
 19 A. I do.  
 20 Q. And the first page at the bottom  
 21 you state, "Oil once it hits the water,  
 22 because it's lighter is going to spread out  
 23 on top of the water, and if you did this in a  
 24 laboratory it would spread out uniformly, but  
 25 since we have wind and currents in the  
 00261:01 environment, it's going to spread out in a  
 02 patchy way."  
 03 Do you see that?  
 04 A. I do.  
 05 Q. Is that -- is that a correct  
 06 statement?  
 07 A. Yes.  
 08 Q. And on Page 4 the host Kate  
 09 Nielson is asking you about how to respond to  
 10 oil spills in the Arctic.  
 11 A. Uh-huh.  
 12 Q. Do you see that?  
 13 A. I do.  
 14 Q. What would be different about an  
 15 oil spill in the Arctic than an oil spill in  
 16 the Gulf of Mexico?

Page 261:18 to 261:23

00261:18 A. The main difference is dealing  
 19 with ice conditions; remote, difficult to get  
 20 to; cold environment situations. Oil behaves  
 21 differently in the Arctic versus the Gulf of  
 22 Mexico.  
 23 Q. (BY MR. ISRAEL) How so?

Page 261:25 to 263:06

00261:25 A. It's going to be more viscous in  
 00262:01 the Arctic than in a -- a warmer area. It's  
 02 not going to weather as rapidly.  
 03 Q. (BY MR. ISRAEL) Okay. And  
 04 if -- Page 6, if I could ask you to look at  
 05 Page 6. And Kate Nielson asks you, "Is there

06 anything our listeners can do to  
 07 support this?" Do you see that? Towards the  
 08 bottom.  
 09 A. Yes, I see -- I see that.  
 10 Q. Can you just read your response,  
 11 please?  
 12 A. "Sure. Yeah Kate," I think the  
 13 main -- "I think the main role for listeners  
 14 is that we do all have a part to play" so  
 15 "maybe not so much in responding, but in" --  
 16 "in helping to prevent them.  
 17 So it goes on to say, "We can  
 18 avoid dumping oil and oily waste into the  
 19 sewer or the garbage," "do other things that  
 20 reduce our use of oil in the first place,"  
 21 take more walks, use bikes, take a bus rather  
 22 than using our car. So all of those things  
 23 that we can do to reduce the use of oil  
 24 actually leads to less oil being transported,  
 25 therefore reduces the risk of a future spill.  
 00263:01 "So we all have a responsibility for spills  
 02 because we're all using oil and we can all  
 03 make a difference and find solutions to the  
 04 problem."  
 05 Q. Do you agree with that  
 06 statement?

Page 263:08 to 263:09

00263:08 A. As a citizen of the U.S. I agree  
 09 with that statement.

Page 263:18 to 268:04

00263:18 Q. (BY MR. ISRAEL) Dr. Merten, if  
 19 I could ask you to look at Tab E in your data  
 20 supplement binder, we're going to mark it  
 21 Exhibit 11792. This is a -- a printout of an  
 22 output file from Query Manager.  
 23 A. Okay.  
 24 Q. Does this look like the type of  
 25 output you would see from Query Manager, not  
 00264:01 looking at the specific data, but just the  
 02 structure of the -- of the document?  
 03 A. Yes.  
 04 Q. And if you look on column D, you  
 05 can see a study name --  
 06 A. Correct.  
 07 Q. -- correct. And Column I  
 08 references the sample date, correct?  
 09 A. Yes.  
 10 Q. Okay. And K is tox PAH; do you  
 11 see that?  
 12 A. Yep.  
 13 Q. Do you know what that unit is?

14 A. Tox PAH 50, it relates to the  
15 sum of 50 PAH analytes. So it's a summation  
16 of 50 PAHs that's associated with the  
17 toxicity studies. So these would be the  
18 toxicity -- suite of PAHs that we'd been  
19 using for sum in the tox data.

20 Q. Is this the tox data or the  
21 water chem- -- column chemistry data? Take  
22 the sample plans.

23 A. Well, the toxicity data. So  
24 this calculation came from the tox program  
25 and targeted 50 PAHs for -- for the sum. So  
00265:01 you can sum PAHs. You could sum 16 of them  
02 if you're looking at EPA's priority  
03 pollutants, or you can sum anywhere in  
04 between. So but if you're going to have any  
05 consistency, you have to use the same  
06 calculation. So the one that this  
07 calculation does in Query Manager picks 50  
08 PAHs that are representative of PAHs that  
09 people are using in the tox studies.

10 Q. And my question is does this  
11 Column K reference a part per billion or what  
12 is -- what is the -- what is the measurement?

13 A. Oh, sorry. Yeah, there -- it  
14 looks like the units are micro- -- micrograms  
15 per liter.

16 Q. Micrograms per liter. Is that  
17 the same thing as saying parts per billion?

18 A. Yes.

19 Q. Okay. So does the Column K  
20 represent the total parts per billion of PAHs  
21 for that sample location?

22 A. Yes.

23 Q. Okay. And if I -- if I could  
24 ask you to look on column AD, there is a --  
25 at the longitude. Do you see that?

00266:01 A. I see that, yes.

02 Q. And this output from Query  
03 Manager includes all of the -- I'll represent  
04 to you--all of the samples that are west --  
05 all -- strike that.

06 Longitude negative 87.31, do you  
07 know where that is?

08 A. No. I would have to look on a  
09 map.

10 Q. I'll represent to you that it's  
11 just west of Pensacola.

12 A. Okay.

13 Q. Assuming that to be the case,  
14 this is -- do you agree that this  
15 Exhibit 11792 appears to be an output from  
16 Query Manager of all of NOAA's water  
17 chemistry data east of longitude 87 --  
18 negative 87.31?

19 A. Yeah, I would go with that.

20 Q. And it's organized by sending  
21 values of total PAHs, correct?  
22 A. Yeah, I see that.  
23 Q. So if you go to the last page of  
24 Tab E, you can see how many samples are  
25 included in those NRDA data -- NRDA --  
00267:01 noaanrda.org that are east of Pensacola. Do  
02 you see that?  
03 A. Uh-huh.  
04 Q. Do you count how many samples  
05 there are?  
06 A. Looks like -- oh, I still have  
07 more, sorry. 586.  
08 Q. And of the 586 water column  
09 samples that NOAA has taken east of  
10 Pensacola, how many are above 1 part per  
11 billion?  
12 A. One.  
13 Q. And do you -- do you see where  
14 it states "Indian River Baseline"?  
15 A. Is that on Page 7?  
16 Q. Yes, on page -- on Page 7, the  
17 one sample that you just referenced?  
18 A. Oh, yes, "Shoreline -- Indian  
19 River Baseline," yes.  
20 Q. And do you know where Indian  
21 River Baseline is?  
22 A. I'm assuming it's at the mouth  
23 of the Indian River and that it's a -- it's a  
24 baseline sample, so it's a pre- -- an area of  
25 the coastline that was not -- so these are  
00268:01 water samples, though. So...  
02 Q. You agree that the Indian River  
03 sample is in an area that's not impacted by  
04 the oil spill, correct?

Page 268:07 to 269:10

00268:07 A. East of Pensacola for these  
08 baseline samples, I would agree with that  
09 statement.  
10 Q. (BY MR. ISRAEL) And you know  
11 that the Indian River is on the east coast of  
12 Florida, correct?  
13 A. No, I wasn't -- not familiar  
14 with the Indian River, so...  
15 Q. Okay.  
16 A. I was taking your word for it  
17 that it's east of Pensacola and in Florida,  
18 so...  
19 Q. Okay.  
20 A. So, no, I didn't know it's on  
21 the east coast.  
22 Q. It is east of Pensacola, but way  
23 east.

24 A. So I would say yes.  
 25 Q. Okay. In any -- in any event,  
 00269:01 the work plan is titled baseline, correct?  
 02 A. Correct.  
 03 Q. So that -- that one sample you  
 04 wouldn't expect to be reflecting any impact  
 05 of the Deepwater Horizon, correct?  
 06 A. Correct.  
 07 Q. Okay. You don't contend that  
 08 there is any oil from Deepwater Horizon that  
 09 made it to the east coast of Florida,  
 10 correct?

Page 269:12 to 269:16

00269:12 A. Correct.  
 13 Q. (BY MR. ISRAEL) So based upon  
 14 Exhibit 11792, you would agree that there are  
 15 no water samples indicating total PAHs above  
 16 1 part per billion --

Page 269:18 to 269:19

00269:18 Q. (BY MR. ISRAEL) -- resulting  
 19 from the spill, correct?

Page 269:22 to 272:16

00269:22 A. I would agree with your  
 23 statement.  
 24 Q. (BY MR. ISRAEL) Okay. Let me  
 25 ask you to look at Tab G, please. Tab G is  
 00270:01 a -- we're going to mark that as  
 02 Exhibit 11793. It's also a printout from  
 03 Query Manager.  
 04 A. Yes.  
 05 Q. And it's -- if you look at the  
 06 longitude, this is a printout from Query  
 07 Manager of all water chemistry data west of  
 08 longitude negative 91.78.  
 09 A. Okay.  
 10 Q. Do you know where longitude  
 11 negative 91.78 is?  
 12 A. Not exactly, but I'm going to  
 13 guess it's west of Louisiana and the Texas  
 14 border.  
 15 Q. I'll represent to you that it's  
 16 just east -- on the east side of Marsh Island  
 17 in Louisiana.  
 18 A. Okay. I don't know where Marsh  
 19 Island is, but it's on the western part of  
 20 Louisiana.  
 21 Q. Well, if you look at Tab H,  
 22 we'll mark that as 11794.

23 A. Oh, great.  
24 Q. You can see where longitude  
25 negative 91.78 is.  
00271:01 A. Okay.  
02 Q. Go back to Tab G, Exhibit 11793.  
03 How many water samples do you have that are  
04 west of Marsh Island, Louisiana?  
05 A. 198.  
06 Q. And none of those samples are in  
07 excess of 1 part per billion; do you agree?  
08 A. I agree.  
09 Q. Let me ask you to turn to Tab I,  
10 please. This is going to be marked as  
11 Exhibit 11795. And, also, we can jump ahead  
12 and look at Tab J which we'll mark as  
13 Exhibit 11796. I'll represent to you that  
14 Tab J, Exhibit 11796, depicts a box around  
15 the wellhead using longitude and latitude  
16 marks as depicted.  
17 A. Okay.  
18 Q. If you go back and look at  
19 Exhibit 11795, that provides you a Query  
20 Manager output. Again, order -- in  
21 descending order of total PAHs; do you see  
22 that?  
23 A. I do.  
24 Q. And using the latitude and  
25 longitude values on Tab 11796, does it appear  
00272:01 to you that -- that the Query Manager output  
02 in 11795 represents all of the NOAA water  
03 column samples outside of the wellhead?  
04 Before you answer that, let me also draw your  
05 attention to the depth column that is  
06 reflected in Column O and P.  
07 A. Okay.  
08 Q. So this -- this -- there are no  
09 samples reflected on this exhibit that are --  
10 that are shallower than 5 meters.  
11 A. Okay.  
12 Q. So with those limitations, this  
13 is a depth greater than 5 meters and outside  
14 of the box depicted on Exhibit 11796, does  
15 this appear to you to be a printout of the  
16 water column data from NOAA NRDA?

Page 272:18 to 273:11

00272:18 A. It appears to me, with the  
19 caveats that you -- or locations that you've  
20 talked about, outside this box and greater  
21 than 5 meters.  
22 Q. (BY MR. ISRAEL) Okay. Can you  
23 tell me with those -- those qualifications  
24 how many water column samples are in the NOAA  
25 database?

00273:01 A. 2,140.  
02 Q. And how many of those samples  
03 are above 1 part per billion?  
04 A. 11.  
05 Q. So is it -- assuming I've  
06 correctly pulled the data from Query Manager  
07 as I described, is it correct to say that  
08 there are 11 water samples out of a total of  
09 2,140 below depth of 5 meters and outside the  
10 box depicted on Exhibit 11796 that are above  
11 1 part per billion?

Page 273:13 to 277:18

00273:13 A. Yes.  
14 Q. (BY MR. ISRAEL) And that's  
15 about one half of 1 percent, correct?  
16 A. Yes.  
17 Q. Let's look at Tab K. This is a  
18 exhibit marked 11797. You see another  
19 printout of an output file from Query  
20 Manager. And this is -- if you look at the  
21 depths and the dates, this is a printout,  
22 I'll represent to you, of all water data from  
23 NOAA NRDA between 5 and 600 meters in 2011.  
24 A. Okay.  
25 Q. Does that appear to be a --  
00274:01 looking at it quickly, does that appear to be  
02 an accurate description?  
03 A. Yes.  
04 Q. How many samples are there  
05 between 5 and 600 meters in 2011?  
06 A. 59.  
07 Q. How many of those indicate a  
08 concentration of total PAHs in excess of 1  
09 part per billion?  
10 A. Zero.  
11 Q. Let me ask you to turn to Tab L,  
12 please. This is Exhibit 11798. And can you  
13 tell from the -- the printout, the title at  
14 the top what this is -- what kind of output  
15 this is relating to?  
16 A. It looks like it's 2010 "Mark  
17 Recapture Dolphin PAH Biopsy" information.  
18 Q. Okay. Does this look like the  
19 type of printout you would get from Query  
20 Manager with respect to the dolphin recapture  
21 program?  
22 A. This is the type of file I would  
23 expect from Query Manager on tissue analysis.  
24 Q. And do you see at the top it  
25 says -- in bold, PAH concentrations in  
00275:01 bottlenose dolphin skin and blubber  
02 samples --  
03 A. Yes.



04 Q. -- collected in Louisiana and  
05 Mississippi in 2010?  
06 A. Yes.  
07 Q. And then it has a -- it says  
08 "Qualcodes."  
09 A. Right.  
10 Q. And it states U equals not  
11 detect, J equals not quantifiable, and blank  
12 is detected? Do you see that?  
13 A. I do.  
14 Q. Okay. What does that mean?  
15 A. So this is part of the  
16 validation code that EcoChem does, and there  
17 are performance criteria the lab needs to  
18 meet to call an analyte detected with enough  
19 confidence to report it as a -- as a  
20 concentration. It doesn't mean that there's  
21 not -- so they qualify it because it doesn't  
22 mean that there's not any analyte there. It  
23 just means it's either -- in the case of J,  
24 not quantifiable, it's -- there could be a  
25 variety of reasons why it's not quantifiable,  
00276:01 but one reason may be that it's below -- or  
02 within that range of the detection limit that  
03 doesn't meet the performance criteria.  
04 Q. I see. So the only instances  
05 where you have the detection of PAHs in  
06 bottlenose skin -- in bottlenose dolphin skin  
07 and blubber would be if the -- the block for  
08 qualcode is blank?  
09 A. Correct.  
10 Q. How many samples of skin and  
11 blubber in bottlenose dolphin collected in  
12 Louisiana and Mississippi in 2010 were  
13 detected for PAHs?  
14 A. So these are individual  
15 analytes; they're not totals, as in the  
16 other. So we're looking at 537 analytes, and  
17 off top of my head on how many samples that  
18 is. Do you know what -- do you know what I  
19 mean?  
20 Q. Yes.  
21 A. Okay. So they're -- so they're  
22 looking at individual compounds in blubber  
23 samples, and there are 537 were at least of  
24 analytes.  
25 Q. And --  
00277:01 A. So, like -- so from -- well, I'm  
02 not even on the last page. Sorry. I was on  
03 Page 9. So on Page 12 there are 614 rows,  
04 analytes. And so on this page they're all  
05 coming from the same sample.  
06 Q. Okay. If you look on Page 6 of  
07 Exhibit 11798, you can see there is a blank  
08 box for at Row 334. Do you see that?  
09 A. Yep.

10 Q. If you look on Page 8, there is  
11 a blank row, a blank box on Row 484 for  
12 qualcode. Do you see that?

13 A. I do.

14 Q. There are no other rows of the  
15 614 that indicate there was a connection of  
16 the PAH in bottlenose dolphins skin and  
17 blubber, correct?

18 A. That's correct.

Page 278:10 to 278:18

00278:10 Q. Okay. And we're talking about  
11 the data selected in the PAH analysis from  
12 2010 bottlenose dolphin recapture program in  
13 Louisiana and Mississippi, correct?

14 A. Correct. So if it's validated,  
15 it should be available.

16 Q. To the public?

17 A. I just would need to check.

18 Yeah, it should be.

Page 280:07 to 280:18

00280:07 Q. I think we covered this earlier,  
08 but you are the principal investigator for  
09 NOAA for the data management technical  
10 working group for the Deepwater Horizon  
11 spill, correct?

12 A. Correct.

13 Q. And you've held that position  
14 since 2010?

15 A. Correct.

16 Q. And you hold that position  
17 currently?

18 A. I do.

UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF LOUISIANA

IN RE: OIL SPILL ) MDL NO. 2179  
BY THE OIL RIG )  
"DEEPWATER HORIZON" IN ) SECTION "J"  
THE GULF OF MEXICO, ON )  
APRIL 20, 2010 ) JUDGE BARBIER  
 ) MAG. JUDGE SHUSHAN

Deposition of U.S 30(B)(6) BY  
AND THROUGH AMY ANN MERTEN, Ph.D., taken at  
Pan-American Building, 601 Poydras Street,  
11th Floor, New Orleans, Louisiana, 70130, on  
the 11th day of June, 2014.

1 THE STATE OF LOUISIANA :  
2 PARISH OF ORLEANS :

3 I, PHYLLIS WALTZ, a Certified Court Reporter,  
4 Registered Professional Reporter, and  
5 Certified Realtime Reporter in and for the  
6 State of Louisiana, do hereby certify that  
7 the facts as stated by me in the caption  
8 hereto are true; that the above and foregoing  
9 answers of the witness, AMY ANN MERTEN,  
10 Ph.D., to the interrogatories as indicated  
11 were made before me by the said witness after  
12 being first duly sworn to testify the truth,  
13 and same were reduced to typewriting under my  
14 direction; that the above and foregoing  
15 deposition as set forth in typewriting is a  
16 full, true, and correct transcript of the  
17 proceedings had at the time of taking of said  
18 deposition.

19 I further certify that I am not, in any  
20 capacity, a regular employee of the party in  
21 whose behalf this deposition is taken, nor in  
22 the regular employ of his attorney; and I  
23 certify that I am not interested in the  
24 cause, nor of kin or counsel to either of the  
25 parties.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, on  
this, the 12TH day of JUNE, 2014.

*Phyllis Waltz*

PHYLLIS WALTZ, RMR, CCR  
TEXAS CSR, TCRR NO. 6813  
Expiration Date: 12/31/14  
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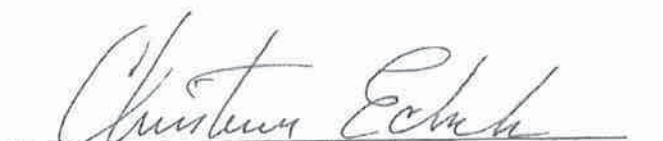
1 I, AMY ANN MERTEN, Ph.D., have  
 2 read the foregoing deposition and hereby  
 3 affix my signature that same is true and  
 4 correct, except as noted above.

5   
 6 AMY ANN MERTEN, Ph.D.

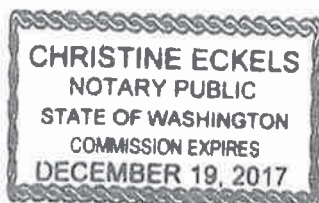
7 STATE OF Washington )  
 8 COUNTY OF King )

9 Before me, Christine Eckels,  
 10 on this day personally appeared AMY ANN  
 11 MERTEN, Ph.D., known to me, or proved to me  
 12 under oath or through WADOLID )  
 13 (description of identity card or other  
 14 document)), to be the person whose name is  
 15 subscribed to the foregoing instrument and  
 16 acknowledged to me that they executed the  
 17 same for the purposes and consideration  
 18 therein expressed.

19 Given under my hand and seal of  
 20 office on this, the 30<sup>th</sup> day of June,  
 21 2014.

22   
 23 NOTARY PUBLIC IN AND FOR THE  
 24 STATE OF ~~LOUISIANA~~ Washington *CE*

25 My Commission Expires: 12-19-2017




## WITNESS CORRECTIONS AND SIGNATURE

AMY ANN MERTEN, Ph.D.

JUNE 11, 2014

Please indicate changes on this sheet of paper, giving the change, page number, line number and reason for the change. Please sign each page of changes.

PAGE/LINE	CORRECTION	REASON FOR CHANGE
11/23	Strike "of", replace w/ "Now"	clarity
10/1	Strike "administration" replace w/ "restoration"	Correction
21/2	"Lori" should be "Laurie"	Correction
21/5	Severbergs should be Zevenbergs	Correction
33/1	replace "ability" w/ "variability"	Correction
33/15	replace "status" w/ "STATIC"	Correction
43/17	"inner" should be "inter"	Correction
47/23	"Fairer" should be "Fair", I don't believe I said 'fairer'	Correction
52/9	"DISBURSED" should be "DISPENSED"	Correction of terms
56/21	should be "Carys M. Ichelmore"	name correction
56/23	"McKay" should be "McCay"	name correction
59/3	"It's NDAA other examples" unsure about. I intended "and, other NDAA authors."	Clarification
64/13	"King" should be "Veliger"	term correction
70/18	"approx" should be "a proxy"	Correction of word used
77/2, 5, 10, 18, 79/1, 78/19	"Tricilate" should be "Tricyclic"	
92/9	"Bin" should be "BENCH"	misspelling

  
 AMY ANN MERTEN, Ph.D.




## WITNESS CORRECTIONS AND SIGNATURE

AMY ANN MERTEN, Ph.D.

JUNE 11, 2014

Please indicate changes on this sheet of paper, giving the change, page number, line number and reason for the change. Please sign each page of changes.

PAGE/LINE	CORRECTION	REASON FOR CHANGE
106/2	"same" SHOULD BE "safe".	misspelling
110/5	replace "the uni-" with "of."	clarity
114/14	strike "if"	clarity
114/24	"pull it" SHOULD BE "cull"	misspelling
120/11	"foren" SHOULD BE "forensic".	misspelling
120/16	"term" SHOULD BE "determine".	incomplete spelling
156/21	"sirc" SHOULD BE "sure".	misspelling
164/23	Don't think I said "CMA" <sup>in this context</sup> <del>but</del> consider striking.	
170/11	"feur" SHOULD BE "first".	misspelling
171/18	"not DOI trustees or" SHOULD BE "DOI resources."	correction
175/9	"sam" SHOULD BE "some" -	Homonym
176/9	"DSS" SHOULD BE "dataset"	misspelling
181/11	"Blinking" SHOULD BE "Blanking"	misspelling
190/5	"and if" SHOULD BE "to see if"	correction
202/12; (203/25)	204/2 "NONE" SHOULD BE "GNOME".	acronym
203/20	"Trajelt" SHOULD BE "trajectory".	misspell, correction
224/19	"ENTRILS" SHOULD BE "ENTRIX".	acronym correct

  
 AMY ANN MERTEN, Ph.D.

## WITNESS CORRECTIONS AND SIGNATURE

AMY ANN MERTEN, Ph.D.

JUNE 11, 2014

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PAGE / LINE

CORRECTION

REASON FOR CHANGE

224/24

"John" SHOULD BE "Jim." Name correction

$$240 \overline{) 17}$$

1. "I'm the DATA" should be "there are no data." Correction

279/25

"IU" stand. for "AU". Spelling correction

$$\begin{array}{r} 280 \overline{) 3} \end{array}$$

"unc" should be "salpitunc". incomplete

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3 of 3