

STATE OF NORTH CAROLINA
COUNTY OF DUPLIN

IN THE OFFICE OF
ADMINISTRATIVE HEARINGS
NO. 10-EHR-5508

HOUSE OF RAEFORD FARMS, INC.,)
)
 Petitioner,)
)
v.)
)
NORTH CAROLINA DEPARTMENT OF)
ENVIRONMENT AND NATURAL)
RESOURCES,)
)
)
 Respondent.)

TRANSCRIPT OF HEARING

Before Honorable Augustus B. Elkins II
Administrative Law Judge

WEDNESDAY, OCTOBER 26, 2011

Courtroom B
Office of Administrative Hearings
1711 New Hope Church Road
Raleigh, North Carolina
10:00 a.m.

Volume 2
Pages 165 through 394

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1 **F U R T H E R P R O C E E D I N G S** 10:01 a.m.

2 (Whereupon,

3 **GEORGE CLAYTON HOWARD, JR.**

4 the witness on the stand at the time of adjournment, resumed
5 the stand and testified further as follows:)

6 The Court: This hearing will come to
7 order. It's now 10 o'clock on October the 26th, 2011. All
8 parties present when we recessed are again present. Mr.
9 Howard, I remind you that you remain under oath.

10 The Witness: Yes, sir.

11 The Court: Redirect---

12 Mr. Jones: (interposing) Thank you, Your
13 Honor.

14 The Court: ---Mr. Jones.

15 **R E D I R E C T E X A M I N A T I O N** 10:02 a.m.

16 By Mr. Jones:

17 Q Good morning. You're still Clay Howard?

18 A Yes, sir.

19 Q And you still work for House of Raeford Farms?

20 A Yes, sir.

21 Q Mr. Howard, I'm just going to ask you a couple of
22 questions to clarify some of the things said yesterday on
23 cross-exam. There was a reference made during cross-
24 examination to the time period when the repair work was being
25 done to the lagoon 1 and lagoon 2, the primary and secondary

1 lagoons. And a reference was made to a gravity pump in
2 relation to that repair work. Would you please explain your
3 answer in that? Was there a gravity pump that was used in
4 that particular operation?

5 A There's no gravity pump. We don't use a gravity
6 pump at all. I don't even know if there's such a thing as a
7 gravity pump. Gravity is what takes product--or waste from
8 one lagoon to the next.

9 Q Was there anything, either material or water in
10 connection with that operation, pumped during that time from
11 lagoon 1 to lagoon 2?

12 A If anything was pumped, it was some residue that
13 we had behind the berm that was just pumped from the first
14 lagoon to the secondary lagoon. It would probably just be a
15 minimal amount of material.

16 Q Material that would have been left after the
17 gravity carried the remainder of it to lagoon number 2?

18 A Yes, sir.

19 Q There was some confusion about the--well, let me
20 strike that. When you said a couple of times that during the
21 operation that I think Mr.--was it Register that handled the
22 mitigation process, getting the water and material from the
23 creek into the lagoons? Do you remember that?

24 A Yes, sir.

25 Q Was it Register?

1 A Yes, sir.

2 Q Okay. In connection with that you said that water
3 was pumped back into either lagoon 1 or lagoon number 2.
4 What did you mean by that when you said "pumped back"?

5 A Water and sludge-like material were pumped into a
6 tanker, and then it was taken around to lagoon number 1 and
7 placed in lagoon number 1 on that Thursday and Friday.

8 Q And Thursday and Friday, would that have been---

9 A (interposing) After the 9th.

10 Q Okay, September 10 and 11---

11 A (interposing) Yes, sir.

12 Q ---of 2009? So the reference to the word "back,"
13 what did that mean, "pumped back"?

14 A It was--I meant pumped into a tanker truck and
15 then it placed over into lagoon number 1.

16 Q Okay. Overnight have you had an opportunity to go
17 back and check a calendar for September of 2009?

18 A Yes, sir.

19 Q Did examining the 2009 calendar equip you to
20 answer questions about those particular days that occurred
21 back in 2009?

22 A I believe I'm better suited, yes, sir.

23 Q Okay. So if you don't mind, to just kind of
24 clarify, what day was September the 9th?

25 A That was on a Wednesday.

1 Q September 10th would have been---

2 A (interposing) Thursday.

3 Q And Friday---

4 A (interposing) Friday, the 11th.

5 Q Okay. When did Mr. Teachey notify you that he had
6 met with the state or federal people?

7 A Friday, that afternoon, the 11th.

8 Q And then the first date you had met with the
9 agents yourself was what day?

10 A Monday, the 14th.

11 Q Okay. Do you remember--based upon looking at that
12 calendar again, when would the pumping operation from creek
13 to lagoons have ended?

14 A To my best ability, I believe it ended about on
15 the 16th, that morning.

16 Q And the 16th would have been what day?

17 A Wednesday.

18 Q Wednesday. There was some discussion of freeboard
19 and you talked specifically about the freeboard on the
20 lagoon, the primary lagoon. And you said something about
21 Parker Bark and a--Parker Bark and a truck or something.
22 Would you clarify that answer, please?

23 A On the north end up there of lagoon number 1, to
24 the left-hand side--Parker Bark uses backhoes and a lot of
25 front-end loaders, very large front-end loaders.

1 (Witness approaches photograph.)

2 Q Are you talking about this area up here
3 (indicating)?

4 A Yes, sir, that road. This road (right here) is
5 used quite a bit for Parker Bark, and---

6 The Court: (interposing) And again, could
7 you describe where on the map that is verbally?

8 A It is the north part left-hand side of the primary
9 lagoon. And they've worn the road down quite a bit. And
10 since then we've actually placed light poles there, something
11 pretty sturdy, to keep them from driving on that so that they
12 don't continue wearing down that side of our lagoon.

13 The water wasn't high, but on that side of the
14 lagoon the actual side of it has been worn down, so it's
15 lower than this side over here (indicating).

16 Q The wastewater level in the lagoon may stay the
17 same, but the Parker Bark people had worn the lip of the
18 lagoon?

19 A Right.

20 Q Have you made an effort to restore that edge or
21 that lip?

22 A Yes, we did, and actually planted some grass. And
23 that effort was completed after I--after I had left the Rose
24 Hill facility. But I believe they've actually planted grass
25 along here (indicating) to keep erosion away. And I know for

1 a fact while I was there we put light poles in this north
2 area (indicating) to deter them from driving on that.

3 Q Did any of the state people, DENR people, tell you
4 during the period of say 2009 that there was a freeboard
5 issue or problem with regard to lagoon number 1?

6 A No, sir.

7 Q Were there state agents, environmental agents, who
8 inspected the lagoons and the plant operation during that
9 time?

10 A Yes, sir.

11 Q And they did not tell you there was any problem
12 with that lagoon---

13 A (interposing) No, sir.

14 Q ---the freeboard for that lagoon?

15 A Correct.

16 Ms. LeVeaux: Objection, clarity on freeboard
17 for that lagoon. I don't know which lagoon you're talking
18 about.

19 Mr. Jones: Lagoon number 1.

20 Ms. LeVeaux: Thank you.

21 By Mr. Jones:

22 Q Because of the questioning yesterday and the
23 answers, I thought I would show you some pictures.

24 The Reporter: Is this Number 8?

25 Mr. Jones: Yes, ma'am.

1 The Reporter: Thank you.

2 Mr. Jones: We'll number it as Number 8.

3 (Petitioner Exhibit 8 was

4 marked for identification.)

5 By Mr. Jones:

6 Q Does this picture bring back any memories, Mr.

7 Howard?

8 A Yes, sir.

9 Q The one on the top.

10 A Yes, sir.

11 Q What does that picture depict?

12 A That is the complete mechanism that we changed out

13 the--that wheel you see is what controls the height of the

14 knife valve. You can't see the knife valve. It's actually

15 below that wooded area there. And then the bottom photo

16 there is actually a picture of the pipe that we replaced out

17 as well.

18 Q That pipe runs underground?

19 A Yes, sir.

20 Q And that is underground under the berm between

21 lagoon 1 and lagoon 2?

22 A Yes, sir.

23 Q The area generally up here (indicating)--show the

24 judge where the--the area where the water--the wastewater

25 goes by gravity from lagoon 1 to lagoon 2.

1 (Witness complies.)

2 A It's right here (indicating), sir, and it just
3 comes right under. And that's a little bit higher than this
4 right here (indicating), and it just kind of flows right in
5 there.

6 The Court: Now what I'll need you to do is
7 to verbally describe that for the record.

8 The Witness: Okay.

9 A The top photo there, you can sight right beneath
10 that wheel there where the mechanism is, that's slightly
11 higher than the other side at the bottom. And water just
12 basically--we open that up and water runs underneath the berm
13 and flows into the secondary lagoon.

14 Q And this picture, if it was taken on September the
15 15th, 2009, that would have been sometime after the repair
16 work was done?

17 A Yes, sir.

18 Q Okay. Put that aside and I'm going to hand you a
19 couple more pictures, Number 9, Exhibit Number 9. That's
20 what I'll do.

21 (Petitioner Exhibit 9 was
22 marked for identification.)

23 Q Do you recognize this area depicted by the top
24 picture, Mr. Howard?

25 A Yes, sir. The top photo is a picture of the

1 secondary lagoon and the bottom photo is a picture of the
2 roadway separating the primary lagoon and the secondary
3 lagoon.

4 Q In terms of direction, on the bottom picture, Mr.
5 Howard, is the primary lagoon on the left and the secondary
6 is on the right?

7 A Yes, sir.

8 Q And in between, this road area, is that the berm
9 you keep talking about?

10 A Yes, sir.

11 Q So the pipe goes under that berm and---

12 A (interposing) Yes, sir.

13 Q Is it shown there, that silver looking item on
14 the---

15 A (interposing) To the right-hand side there's a
16 little silver pipe running there. That's the pipe.

17 Q In the repair of the secondary lagoon area, was
18 this berm repaired or was there any work done to the berm?

19 A The berm was not repaired so much as we had to dig
20 up the pipe. We dug about 4 feet--I couldn't tell you
21 exactly how far we dug. We dug about 4 feet on the left-hand
22 side, on the right-hand side probably a little bit deeper,
23 seeing that we had to position the pipe downward just a
24 little bit. And we just had to basically repair the berm
25 where we did the initial work.

1 Q Okay. I notice in both pictures there's a picture
2 of some equipment like a backhoe or something. Do you recall
3 that sitting there?

4 A Yes, sir. That was--we used that to do some of
5 the work, to do the digging.

6 Q Okay. And was that a company---

7 A (interposing) No, sir.

8 Q ---equipment or---

9 A (interposing) No, sir. That's owned, I believe,
10 by Davey Cavanaugh.

11 Q The questioning that was done that you referred to
12 of the company employees before and after you were spoken
13 with on September the 14th--did the state agents and a
14 federal agent speak with you on the 14th?

15 A Yes, sir. Mr. Rhame spoke with me and Ms. Linda
16 Willis spoke with me in my office.

17 Q Did those people also speak with your company
18 employees?

19 A Yes, sir.

20 Q Did you speak with the agents after they spoke
21 with your employees?

22 A A few times, yes.

23 Q How many of the employees did they speak with?

24 A I believe they spoke with--well, they spoke with
25 Chris Murray, the plant manager, Ashley Guy, the maintenance

1 manager. They interviewed--some separate agents with the EPA
2 interviewed Joe Teachey, and then I know some agents inter-
3 viewed Davey Cavanaugh's staff.

4 Q Did the employees that were interviewed or
5 questioned--did they indicate to those agents that the
6 company was responsible for that---

7 A (interposing) They did not.

8 Q They did not say that the company was responsible?

9 A They said the company was not responsible. We
10 hadn't pumped anything.

11 Q Do you remember where the interview occurred
12 between the federal agents and the employees?

13 A I believe it was conducted at the spray field, and
14 I know one interview was at the restaurant in Rose Hill. I
15 don't recall if it was with our employees or with Davey
16 Cavanaugh, but I believe they had a couple of interviews
17 there at the restaurant in the parking lot.

18 Q In the parking lot?

19 A Yes, sir.

20 Q Out in the--outside or---

21 A (interposing) Yes, sir, in their cars.

22 Q In their car?

23 A Yes, sir.

24 Q When yesterday you talked about, again, the
25 pumping operation between the creek and the lagoon, there was

1 a mention of a hose or something that was laying on the
2 ground between the creek and some lagoon. Do you remember
3 which lagoon that would have been?

4 A It was over--if you look at Exhibit 9, I believe
5 that was at the bottom between where the work was done, where
6 the actual knife valve is, and where that backhoe is to the
7 left-hand side. And that's where we took the tankers and
8 drove around here (indicating).

9 The tank drove I believe in the direction where
10 this front-end loader is. And that is a quick release hose,
11 and it was attached to that tanker. And that tanker was
12 emptied--the contents of the tanker was emptied into the
13 primary lagoon there.

14 Q So that hose led from the tanker to the lagoon?

15 A Yes, sir.

16 Q Not from the creek to the lagoon?

17 A Correct.

18 Q Do you remember how long that hose would have
19 been?

20 A That particular hose, no, sir.

21 (Pause.)

22 Mr. Jones: I think that's all the
23 questions we have.

24 The Court: Recross?

25 Ms. LeVeaux: I do have a few.

1 The Court: All right.

2 RE CROSS - EX AM I N A T I O N 10:18 a.m.

3 By Ms. LeVeaux:

4 Q The fact of the matter, Mr. Howard, is that

5 nothing would have prevented the hose from going from the

6 creek to the lagoon; isn't that true?

7 A Nothing would have prevented the hose from going

8 to the creek? I don't understand that exactly.

9 Q I'm saying the fact of the matter is you know of

10 nothing that would have prevented the hose from going from

11 the creek to the lagoon; isn't that true?

12 A I don't quite understand. I'm sorry.

13 Q You've referenced to a hose?

14 A The hose that connected to the tanker.

15 Q Right. But you know of nothing that would have

16 prevented--do you know of anything that would have prevented

17 that hose from going to the creek?

18 A I guess it could have been taken over there.

19 Q I'm sorry.

20 A Possibly--no, I don't know of anything.

21 Q Thank you. Just a few questions. There was--in

22 Petitioner's Exhibit Number 9, and I'm looking at the lower

23 photo. And we provided these photos to you, did we not?

24 A Yes, ma'am.

25 Q And I'm looking at the lower photo, and you

1 referenced to the primary lagoon being on the left and the
2 secondary lagoon being on the right; is that correct?

3 A Yes, ma'am.

4 Q Is there any benefit to having vegetation in the
5 primary lagoon?

6 A No, ma'am.

7 Q And in fact that's something you would remove;
8 isn't that correct?

9 A Periodically.

10 Q And it's your understanding that they--your folks
11 did subsequently remove a lot of that vegetation; is that not
12 correct?

13 A We did.

14 Q Can you tell me if the valve replacement was like
15 for like?

16 A Do you mean the same?

17 Q Yes, sir.

18 A To my best ability, I believe it was.

19 Q So you had the same valve in and you put the same
20 valve--you had the same valve in before, and that's what you
21 took out? That's your understanding?

22 A It was similar. I'd be lying if I--I don't know
23 exactly, but very similar. I mean I couldn't imagine too
24 many variations of it. I don't know if it was made by the
25 same company or not, no, ma'am.

1 Q Is it fair to say that you were having problems
2 with the valve and that's why you replaced it?

3 A Yes, ma'am.

4 Ms. LeVeaux: Thank you, sir. No further
5 questions.

6 The Court: Anything further, Mr. Jones?

7 Mr. Jones: Just one question.

8 **F U R T H E R R E D I R E C T E X A M I N A T I O N**

9 _____ 10:21 a.m.

10 By Mr. Jones:

11 Q On the hose issue, I think you testified on direct
12 that the distance between the primary lagoon and the creek
13 was 675 feet---

14 A (interposing) Yes, sir.

15 Q ---give or take a few feet?

16 A Yes, sir.

17 Q Would that hose have been long enough to go from
18 the creek---

19 A (interposing) No, sir. That was a hose that just
20 pumped--that was a small hose that you could actually pick
21 up. Again, I don't know exactly the length of it, but I mean
22 that was a hose that you could grab and hook up to the
23 tanker, and it's just a quick release, and just run it into
24 whatever you want to run it into. And it's something you can
25 pick up with your hand.

1 A They handled the cleanup aspect of it because
2 Davey Cavanaugh doesn't have a tanker truck. He doesn't do
3 septic work.

4 Q Okay. But you don't really know how many hoses
5 Mr. Cavanaugh has, do you, or do you know?

6 A No, I do not.

7 Q And you don't know how many hoses Mr. Register may
8 or may not have, do you?

9 A No, ma'am.

10 Ms. LeVeaux: Thank you. No further
11 questions.

12 The Court: Anything further?

13 Mr. Jones: Nothing further, but at this
14 time I think I'll move admission of Exhibits--Petitioner's
15 Exhibits 1 through 9, I think.

16 The Court: Any objection?

17 Ms. LeVeaux: Well, Your Honor, we would
18 object because the Environmental Chemists--he said he
19 received them. But as it relates to the--and I believe it
20 was illustrated in fact that he had received them.

21 But when I asked him specifics about those
22 Environmental Chemists documents, and there's a lot of
23 information in there, he couldn't substantiate where the
24 samples were taken. And those are questions that go to the
25 various variables that were analyzed. So we thought that

1 that evidence was just something he received, but we would
2 like more substantiation to those documents.

3 The Court: So you're objecting to your own
4 letter? So you're objecting to Petitioner's 1 through 9 is
5 my question.

6 Ms. LeVeaux: No. I'm objecting to the
7 Environmental Chemists documents. Those were not our
8 documents, Your Honor.

9 The Court: Which exhibit are you objecting
10 to?

11 Ms. LeVeaux: They're within 1 through 9.

12 The Reporter: I believe they're 6 and 7, Your
13 Honor.

14 Ms. LeVeaux: 6 and 7.

15 The Court: So you have no objection---

16 Ms. LeVeaux: (interposing) And it may be 5
17 because 5 may be the reports. So just---

18 The Court: (interposing) Let me go--do
19 you have any objection to Petitioner's Exhibit 1?

20 Ms. LeVeaux: I'm sorry, Your Honor. Just
21 give me a minute to pull those exhibits out.

22 The Court: All right.

23 (Pause.)

24 Ms. LeVeaux: Your Honor, if I may approach
25 the court reporter, I think I have them in another---

1 Ms. LeVeaux: No objections to Number 4.
2 The Court: Number 4 is admitted.
3 (Petitioner Exhibit 4 was
4 received in evidence.)
5 Ms. LeVeaux: No objections to Number 5.
6 The Court: Number 5 is admitted.
7 (Petitioner Exhibit 5 was
8 received in evidence.)
9 Ms. LeVeaux: I would just object to Number 6
10 and Number 7--I'm sorry.
11 (Pause.)
12 Ms. LeVeaux: Number 6, Number 7.
13 (Pause.)
14 The Reporter: 8 and 9 are the pictures.
15 Ms. LeVeaux: Oh, okay.
16 Mr. Jones: Yes, 8 and 9 are the pictures.
17 Ms. LeVeaux: Number 6 and Number 7, Your
18 Honor.
19 The Court: Okay. Your response to her
20 objection, Mr. Jones?
21 Mr. Jones: Simply this: I think that
22 the--first of all, the questions regarding the environmental
23 testing was in relation to a previous exhibit. I believe it
24 was Exhibit--there was Environmental Chemists testing
25 attached to Exhibit Number 4, where they had also done that

1 (Petitioner Exhibits 8 and 9
2 were received in evidence.)
3 The Court: You may step down. Thank you,
4 Mr. Howard.
5 (Pause.)
6 The Court: Your next witness.
7 Mr. Jones: It's Jay Holley. Your Honor,
8 this is really going to be a challenge for a technologically
9 challenged person. But also, Mr. Holley is more tech savvy
10 than I am, so he may need a minute to set up up there.
11 The Court: Well, let me get him sworn in
12 first and then we'll do that.
13 (Whereupon,
14 **JAMES K. HOLLEY, P.G.**
15 was called as a witness, duly sworn, and testified as
16 follows:)
17 The Court: If you'll have a seat, please,
18 sir?
19 The Witness: Thank you.
20 The Court: If you would state your first
21 and last name and spell them both, please?
22 The Witness: Yes. My first name is James.
23 My last name is Holley. My first name is spelled J-a-m-e-s,
24 the last name, H-o-l-l-e-y.
25 The Court: Thank you very much.

1 The Witness: Thank you. I'll need a moment
2 to---

3 The Court: (interposing) That will be
4 fine.

5 The Witness: ---connect the computer and be
6 able to pull up my slides.

7 The Court: That's fine.

8 (Pause.)

9 The Court: You can direct your attention
10 to Mr. Jones.

11 D I R E C T E X A M I N A T I O N 10:30 a.m.

12 By Mr. Jones:

13 Q Are you all set up now?

14 A I believe so. Let's hope that the technology
15 holds out for us.

16 Q All right. Mr. Holley, you've introduced
17 yourself, but tell me where you live and where you work.

18 A I live in Greenville, North Carolina, grew up
19 there, and I've been a resident for a number of years. I
20 work at Groundwater Management Associates with an office in
21 Greenville. We also have an office in Apex, North Carolina.

22 Q And how long have you worked there?

23 A I started working for GMA, which is our acronym--
24 started working there in 1999, and I've continuously worked
25 with them up till the present time.

1 Q Okay, since 1999?

2 A Yeah, approximately 12 years.

3 Q And tell me what is your position. What positions
4 have you had since 1999?

5 A I am a senior hydrogeologist. I've had that
6 position for the entire time that I've been there. I'm
7 director of the Water Resources Division of our company in
8 the Greenville office. I supervise a group of geologists,
9 staff geologists and project geologists, in doing water
10 resource evaluation and development as well as other studies
11 related to surface water flow and wastewater.

12 Ms. LeVeaux: Your Honor, if I may, I can't
13 hear. If you could just speak up a little?

14 The Witness: Okay. I will try to do that.

15 Ms. LeVeaux: Thank you.

16 By Mr. Jones:

17 Q Okay. And if you would, tell us, exactly what is
18 hydrogeology?

19 A Hydrogeology is the study of the interaction of
20 water with earth materials and the different aspects of water
21 and earth material interactions.

22 Q Have you been involved in hydrogeology since you
23 finished school?

24 A Yes. I was hired first as a hydrogeologist in
25 December of 1989 working for a company based here in the

1 Raleigh area. And I've continued in that capacity with
2 several different companies up until I was hired by GMA. And
3 I do that same type of activity for them.

4 Q If you would, tell us about your post high school
5 education.

6 A Okay, I'll be glad to do that. I have an under-
7 graduate degree in anthropology with a focus in archeology
8 from East Carolina University. That degree had a minor in
9 geology. I completed that degree in 1986. And then I
10 entered graduate school at East Carolina University and
11 worked on a master's degree in geology, which I earned in
12 1990.

13 Q Okay. So your M.S. at East Carolina University is
14 in what field?

15 A It's in geology.

16 Q And that was in 1990, so tell me about your work
17 experience since then.

18 A Since 1990, I first was--I took a job with a
19 company called Applied Environmental Services. It was a
20 small consulting company based in the Research Triangle Park
21 area. We moved our office around a couple of times. Part of
22 the time we were in Cary; part of the time we were in
23 Morrisville. I worked for them for six years, until 1996.

24 They changed names through a buyout by another
25 company. They changed their name to ENSCI Engineering Group,

1 P.A. That was an acquisition by a company based out of High
2 Point named ENSCI Corporation, but it was the same company.
3 I didn't change jobs.

4 For that company I was involved in a variety of
5 soil and groundwater assessment work at predominantly
6 pollution sites associated with petroleum products released
7 from underground storage tanks. I also did a variety of
8 Phase I and Phase II environmental site assessments for
9 property transfers, evaluating the environmental setting of
10 sites for properties that people would be interested in
11 transferring to someone else.

12 I also worked on some hazardous waste site
13 investigations, including some groundwater studies of heavy
14 metals in groundwater under the RCRA, Resource Conservation
15 and Recovery Act, program. I also worked on some hazardous
16 waste site evaluations, inactive hazardous sites dealing with
17 a variety of solvent laden wastes at some industrial
18 facilities and directed some cleanup of some of those type of
19 contaminants. And some of those sites were--most of those
20 sites were in North Carolina. Several of them were in other
21 states.

22 Q How long did you work at that particular place?

23 A My work with Applied Environmental Services and
24 ENSCI Engineering Group lasted until 1996. It was approxi-
25 mately six years, a little bit over six years that I was with

1 them.

2 Q Where did you go then?

3 A Then I took a job with Geophex Limited, which is a
4 specialty geophysics consulting company based here in
5 Raleigh. They're in downtown Raleigh. They've been in
6 business for quite a while and were started by--I'm sorry;
7 I'm drawing a blank now--a N.C. State geophysics professor
8 who started his own company, I.J. Won, thank you, was his
9 name.

10 They hired me at Geophex to assist with managing
11 some large contracts with the federal government to evaluate
12 various contaminant release incidents on military facilities
13 that--Geophex had an indefinite delivery quantity contract
14 with the government to work at various installations.

15 The bulk of my work for Geophex involved a large
16 focus feasibility study of the Letterkenny Army Depot in
17 Chambersburg, Pennsylvania. I secured my license in geology
18 in Pennsylvania to be able to legally do that project.

19 And that project involved release of chlorinated
20 solvents from some industrial operations at this army depot
21 that was being decommissioned under the Base Realignment and
22 Closure program. The chlorinated solvents had entered a
23 complex, fractured, and cavernous limestone system that had
24 very high groundwater flow velocities and caused significant
25 problems with containing the contaminants on the base and

1 preventing movement and entry into off-base areas that might
2 pose a health concern.

3 Q And you worked three years with that firm?

4 A I worked for three years with that firm.

5 Q And then you went in 1999 to the company you're
6 with now; is---

7 A (interposing) Yes.

8 Q ---that correct?

9 A That's correct.

10 Q You've had experience dealing with studies of
11 water flow and that sort of thing in terms of creeks and
12 branches?

13 A Yes, extensive experience. I've worked on a
14 variety of projects similar to the one here, several of which
15 involved lagoon systems for poultry facilities. I'll give
16 some examples.

17 One is--recently I worked on the Sanderson Farms
18 slaughterhouse evaluation for the Nash County--proposed Nash
19 County facility where they were looking at developing water
20 resources to meet their needs for source water as well as
21 handling disposal of their effluent on spray fields and
22 selection of property 6 miles away from the plant site that
23 was suitable for potentially disposing of that effluent. It
24 was a very similar type of effluent as what the House of
25 Raeford Farms handles.

1 As a part of that project, I also visited
2 Sanderson Farms' facilities at their Kinston plant, which is
3 a new facility, got to see their lagoon system and their
4 treatment process and their spray fields. And I visited one
5 in Moultrie, Georgia that they operate at that location.

6 I've also worked on egg production type
7 facilities, Rose Acre Farm. We worked on a water supply
8 development project for Rose Acre Farm, which is in Hyde
9 County, North Carolina. They were building a new facility to
10 produce eggs and they needed a water supply. And I worked
11 directly on developing a well field that would supply their
12 needs for that operation.

13 I also worked on the Sunnyside egg facility in
14 Greenville, North Carolina, or Pitt County, North Carolina.
15 I believe that facility may be decommissioned now. This was
16 back when I was with Applied Environmental Services. They
17 had two waste streams at that facility. One was their
18 standard waste associated with their henhouses. Another was
19 a waste associated with washing the eggs before they were
20 packaged and shipped out.

21 And the Division of Water Quality considered that
22 wash water to be a separate process that needed to be
23 permitted separately. So I was offering hydrogeological
24 services to the engineer who designed the project to evaluate
25 spray field potential or subsurface infiltration potential on

1 their property to handle that source of water as a separate
2 disposal.

3 Q Have you had experience taking, collecting, and
4 using test results such as Mr. Howard referred to in his
5 testimony from Environmental Chemists?

6 A Yes. I've hired laboratories throughout my entire
7 career. That's a common process that we do. As a project
8 manager on a hydrogeologic investigation, you undertake all
9 the aspects of doing an investigation, including selecting a
10 lab that's qualified to do the testing, contracting with the
11 lab, selecting the locations, collecting samples, keeping
12 those samples under proper chain of custody, submitting them
13 to the lab, verifying if the quality of the product brought
14 back from the lab is appropriate and meets standards of care
15 in their quality assurance plans, as well as meeting the
16 needs of the project that's--that's under investigation.

17 Q Have you had experience dealing with Environmental
18 Chemists before?

19 A Yes. We use Environmental Chemists on a routine
20 basis for our drinking water sampling projects throughout the
21 coastal plain of North Carolina. They are a drinking water
22 certified lab and we use them predominantly for that service.

23 And I know their individuals personally. Jay
24 Baker is our point contact that we work with to place orders
25 for sample kits to do new well water sampling for public

1 water systems predominantly.

2 Q In your experience dealing with them, have you
3 found them to be competent and dependable professionals?

4 A I have.

5 Q How have you used the results that they have
6 produced for you?

7 A Which results are you referring to?

8 Q The creek sampling and that sort of thing.

9 A The sampling done in 2010?

10 Q Well, before that, any of the---

11 A (interposing) And before that?

12 Q Uh-huh.

13 A Well, I've reviewed that information and placed it
14 into the context of where it was collected and compared it
15 with the other available data about the hydrology of the
16 system and documentation provided by you from records from
17 the state as a production in this case to make interpreta-
18 tions.

19 Q Have you done that sort of thing with
20 Environmental Chemists before?

21 A Yes.

22 Q How have you used that information?

23 A On other cases or---

24 Q (interposing) Other cases, yes.

25 A ---this one? Well, on other cases, using that

1 kind of information might help me to understand more about
2 where impaired areas might be: if I were doing water
3 sampling from a well and we find maybe evidence of coliform
4 bacteria in the well, would that be a result of aquifer
5 conditions that might be contaminated or is it something
6 about well construction, where the well might be poorly
7 constructed allowing bacteria to enter it, or maybe perhaps
8 the contractor put the well in and didn't properly disinfect
9 his work before he pulled off of the well and that's causing
10 a positive coliform bacteria, something of that nature.

11 Q Have you had significant experience doing that
12 kind of work?

13 A Absolutely. That's been the bulk of what I do
14 over the last at least six, seven years have been pre-
15 dominantly water supply work.

16 Q Okay. I'm going to hand you a document that will
17 be marked Exhibit Number 10.

18 (Petitioner Exhibit 10 was
19 marked for identification.)

20 Q Do you recognize that document, Mr. Holley?

21 A Yes, this is my résumé. It lists my experience
22 and qualifications.

23 Q Did you prepare this document yourself?

24 A I did.

25 Q Okay, and you've reviewed it prior to today?

1 A Yes, I have.

2 Q Is the information in this document accurate?

3 A Yes, it is.

4 Q Accurate when it was prepared and accurate today?

5 A Yes.

6 Q And this document accurately reflects your educa-
7 tion?

8 A Yes, it does.

9 Q Your professional registration and service?

10 A Yes, it does.

11 Q Your professional affiliations?

12 A Yes, it does.

13 Q It also---

14 A (interposing) Actually, I have recently also
15 joined the AGU. I believe it's the American Geophysical
16 Union, which--they have some nice publications that I've
17 wanted to get.

18 Q This also includes your professional experience?

19 A It does.

20 Q From the time of your education completion to
21 today?

22 A Yes, it does.

23 Q Have you had any experience teaching?

24 A Yes, I have. I have taught four sections of
25 physical geology lecture at East Carolina University between

1 2006 and I believe 2009. Those are entry level--freshman
2 level introductory geology classes, three hour lectures a
3 week. I've taught that on four occasions, and I've been
4 asked to teach that again in the upcoming semester in the
5 spring.

6 Q Does this include all--does this résumé include of
7 your--the publications that you have participated in
8 preparing?

9 A The ones that I was able to recall and assimilate.
10 I may have been listed as a second author on something by
11 someone else that didn't make it on here.

12 Q But this lists all of those professional publica-
13 tions and also--is that true?

14 A That's correct. Yes.

15 Q And the continuing education courses you've taken?

16 A Yes.

17 Mr. Jones: Your Honor, without further
18 ado--I could go further, but I would like to offer Mr. Holley
19 and have him accepted as an expert in the field of hydro-
20 geology.

21 The Court: Do you wish to voir dire Mr.
22 Holley?

23 Ms. LeVeaux: No.

24 The Court: Any objection to that offer?

25 Ms. LeVeaux: No, sir.

1 The Court: He's so accepted.

2 Mr. Jones: All right. Thank you.

3 By Mr. Jones:

4 Q In the last couple of years were you contacted to
5 perform some sort of work by House of Raeford Farms?

6 A Yes, I was.

7 Q Okay. Explain the nature of the engagement that
8 was proposed.

9 A Yes. House of Raeford Farms contacted me and
10 notified me that they had received a notice of violation from
11 the state associated with this case and that they--they did
12 not believe that they were responsible for the conditions
13 that were observed in the creek that they'd been cited for.

14 And they wanted an independent review of the
15 available data produced by the state and the studies that
16 were done by the state and the EPA to see if I draw the same
17 conclusions or were there other aspects of the case that
18 maybe had been overlooked that might better explain the
19 conditions that were observed.

20 Q And who did you speak with in terms of that
21 engagement?

22 A Clay Howard.

23 Q The gentleman who's here today?

24 A Yes. And I remembered his name.

25 Q Did you undertake that engagement?

1 A Yes, I did.

2 Q Did you--did you feel qualified to perform that
3 engagement?

4 A I did.

5 Q What qualifications did you think were necessary
6 to successfully complete that engagement?

7 A I felt like to properly evaluate the conditions
8 observed in the creek, one needs to have training and under-
9 standing in groundwater and surface water, especially surface
10 water hydraulics, and in contaminant distribution and trans-
11 port within a surface water system. And I have that
12 training.

13 Q So you undertook that engagement. When did you
14 start, Mr. Holley?

15 A I believe early January of 2011 is when I first
16 met with Mr. Howard to begin our work.

17 Q Now, were you given documents from the company or
18 documents that were generated in this particular litigation
19 in doing this engagement?

20 A I received a number of documents that were
21 provided by your firm to me as production associated with
22 this case.

23 Q Tell us what documents you've reviewed.

24 A I've written up a list of those documents that I
25 provided to you folks this morning. It included--and I can't

1 remember all the dates off the top of my head, but packets of
2 information tabbed by the state. I believe one I received in
3 early January 2011. Actually, there was one packet sent to
4 me in December 2010, when the first dialogue occurred. So I
5 may have been incorrect about my statement.

6 Q Would it help you to look over that list?

7 A Please. Thank you.

8 (Document handed to witness.)

9 A Yes. So the list of documents that I've reviewed
10 included a packet of information that was dated December
11 13th, 2010 listed as 10-EHR-5508, Respondent's Responses to
12 Petitioner's First Set of Interrogatories and Request for
13 Production of Documents. And that included tabbed Exhibits A
14 through M. Do you want me to go through the whole list?

15 Q If you don't mind.

16 A January 7th, 2011, I received a packet of
17 documents from your firm. It was a document production
18 provided by Lori Jones. This says, "10-EHR-5508, Second Set
19 of Index of Respondent's Production of Documents." It
20 included Exhibits 1 through 32, tabbed.

21 January 13th, 2011, document production was
22 provided by Lori Jones. It included color copies of North
23 Carolina Division of Water Quality photos from September
24 10th, 11th, 15th, 17th, and 23rd. That was in response to my
25 request for clearer photographs because the first set I

1 received were all in black and white. And so that was given
2 to me as a supplement in color so I could see the originals.

3 March 11th, 2011, document production provided by
4 Lori Jones; it was a copy of the EPA documents, a report by
5 Kenneth Rhame dated September 16th, 2009, a subsequent report
6 by Kenneth Rhame dated September 30th, 2009, field notes from
7 Rufino Salgado, who I believe works for a contractor to the
8 EPA and was a part of the study, a report by Rufino Salgado--
9 OTIE was the company name--dated April 6th, 2010.

10 I also reviewed laboratory analytical reports
11 provided to me by House of Raeford Farms from Environmental
12 Chemists. And the lab reports were dated September 16th,
13 2009, September 2nd, 2010, September 16th, 2010, September
14 30, 2010, and October 8, 2010.

15 I also reviewed an August 4, 2011 correspondence
16 from Anita LeVeaux to Henry Jones and Lori Jones titled
17 Respondent's Response to Petitioner's Second Set of
18 Interrogatories and Request for Production of Documents.

19 I also reviewed August 10th, 2010 Findings and
20 Decision and Assessment of Civil Penalties prepared by Jeff
21 Poupart; January 5 and 6, 2010 deposition of Linda Willis,
22 Volumes 1 and 2; January 5, 2010 deposition of Jeff Poupart;
23 January 5, 2010 deposition of Geoff Kegley; June 9, 2011
24 deposition of Joe Teachey.

25 I also did independent review of available public

1 records online including a North Carolina Division of Water
2 Resources drought monitoring history on their web site at
3 www.ncwater.org. I also looked at available databases that
4 can be interfaced with ARCVIEW GIS software that covered the
5 Rose Hill area, and those are mostly aerial photographs and
6 LIDAR data that can be downloaded and manipulated for
7 producing maps.

8 Q Did you have occasion to do any site visits to the
9 area?

10 A I made two site visits. One was in early January,
11 I believe January 13th--I have some photos--of 2011. I have
12 some photos that will document the date better. I'm not
13 great on remembering dates. And then subsequently, I believe
14 on April 13th, 2011, was a second visit with a more extensive
15 exploration of the creek by boat.

16 Q Okay. Now, tell me in terms of the January site
17 visit, what did you do and how did you do it?

18 A The main thing that we did on that visit was get
19 acquainted with Mr. Howard and have a discussion with him at
20 his facility. He took me on a tour of the facility, of the
21 exterior portion. I didn't go inside the food production
22 areas.

23 We toured all the wastewater facilities, met with
24 his operators, his maintenance people, walked a section of
25 the creek there adjacent to the secondary lagoon--Cabin

1 Branch is the name of that creek that we looked at--took a
2 few photographs of that area.

3 We also looked at some--I'm sorry. I also visited
4 other areas nearby, including the Duplin Winery facility. I
5 didn't go on the property, but I drove by and took a look at
6 its location on that date and also looked at the Carolina
7 By-Products facility from the road and the railroad tracks.

8 Q Okay. And that was in January of---

9 A (interposing) That was in January 2011.

10 Q How about the visit you did subsequent?

11 A The visit in April of 2011 was to gain a more
12 intimate understanding of the nature of the stream channel
13 and the nature of the hydraulics of Cabin Branch and its
14 convergence with Beaverdam Branch.

15 We deployed a boat into Cabin Branch from the area
16 right adjacent to the secondary lagoon. We had a small
17 johnboat, had a trolling motor that we attempted to use for
18 conveying us through that creek. Because of the numerous
19 sunken logs and obstructions, the trolling motor wasn't a
20 whole lot of use when we were in the creek. We had to mostly
21 paddle and use a bamboo pole to push ourselves along through
22 that very stagnant stretch of the creek.

23 We continued downstream through the abandoned
24 quarry section, the pond, where the Cabin Branch enters a
25 large, open, abandoned quarry lake. And then we went across

1 the quarry lake and continued downstream where the Cabin
2 Branch exits the quarry lake and continues downstream toward
3 Sheffield Road, where it converges with Beaverdam Branch.

4 Q Did you go any further downstream than that?

5 A We went downstream of Sheffield Road as far as we
6 were able to with the johnboat until we hit a large log, a
7 rotting log, that was blocking across the entire stream. And
8 I'll show some photos of that later, if you give me the
9 chance.

10 Q And then how about upstream?

11 A Upstream, we attempted to go by boat some distance
12 upstream toward Brooks Quinn Road. The stream channel was
13 impassable by boat through that stretch, so we abandoned that
14 endeavor and we--I had a colleague with me named Brion Byers,
15 who was a geologist, a project geologist with my firm, that
16 was there for safety and just physical assistance for me to
17 access areas that I needed to go. And he and I together did
18 a reconnaissance by foot of remaining accessible areas that
19 we could get to without unduly trespassing on private
20 property.

21 Q And how far upstream--in the upstream area did you
22 go?

23 A We explored areas behind Magnolia Elementary
24 School, which is upstream some distance from Brooks Quinn
25 Road bridge. We got permission from--actually, Clay was able

1 to contact the vice principal there, I believe, and he gave
2 us the ability to enter the property and access the creek
3 across their property. And I have some notes that we took
4 from that portion of our visit.

5 We stopped at accessible viewing points of the
6 creek at public roads, especially at Highway 117 where Cabin
7 Branch crosses under. And we also drove up to the entryway
8 to the Carolina By-Products and walked the railroad tracks to
9 where Cabin Branch crosses under the railroad tracks and
10 looked at that stretch of the stream as well.

11 Q So had you ever done any kind of business with
12 House of Raeford before?

13 A No, sir.

14 Q Have you ever done any business with Carolina
15 By-Products or Duplin Winery?

16 A No, I have not.

17 Q I'm going to hand you a set of documents.

18 The Reporter: Number 11?

19 Ms. Jones: There are going to be several
20 numbers.

21 Mr. Jones: No, several in one bundle.

22 Well, let's not do that. Let's do it this way.

23 (Petitioner Exhibit 11 was
24 marked for identification.)

25 By Mr. Jones:

1 Q Do you recognize this document, Mr. Holley?

2 A I do.

3 Q What is this document?

4 A I believe it was part of one of the productions of
5 discovery responses by the State to the request for providing
6 documents, and it relates to, I believe, stormwater moni-
7 toring conducted by the Valley Proteins, also known as
8 Carolina By-Products, facility at Rose Hill.

9 Q Okay. And this document was sent from the State
10 to us and then from us to you?

11 A Yes.

12 Q Okay. And it relates to Valley Proteins or
13 Carolina By-Products?

14 A Correct.

15 Q Does this content mean anything to you? What does
16 this content reveal?

17 A Well, it shows that during routine--well,
18 apparently routine, but normal annual stormwater monitoring,
19 there were a number of parameters that were being sampled and
20 analyzed by the Valley Proteins/Carolina By-Products
21 facility. And they show a record since 2006, 2007, 2008, and
22 into 2009 of elevated fecal coliform bacteria in their storm-
23 water monitoring locations.

24 Q Okay. And these are--the time period measured is
25 2006 through January of 2009?

1 water by the railroad tracks. And that was apparently a
2 concern of theirs, that there wasn't sufficient stormwater
3 runoff from the facility and they were making note of it.

4 Q And this was April the 16th--this document appears
5 to be dated April the 16th of---

6 A (interposing) Correct.

7 Q ---2009. And I hand you another document.

8 (Petitioner Exhibit 13 was
9 marked for identification.)

10 Q Mr. Holley, does the--the letters DWQ, does that
11 mean anything to you, DWQ?

12 A DWQ is an acronym for the Division of Water
13 Quality.

14 Q Have you seen document number 13 before?

15 A I believe I have.

16 Q And what does this represent?

17 A It is a notice of violation issued to Mr. David
18 Frey of Valley Proteins, the company also known as Carolina
19 By-Products. And it is addressing compliance issues related
20 to their stormwater permit and also refers to illicit
21 discharges that occur from the offal parking/staging area.

22 "The offal staging area does not provide suffi-
23 cient containment to prevent leakage of offal to
24 the ground exposed to stormwater. The offal area
25 has a discharge point at the southeast corner of

1 the parking area. Structural BMPs," which means
2 best management practices, "will need to be pro-
3 vided to contain and treat this wastewater
4 properly. The offal from this area must be
5 eliminated until proper containment is provided."

6 Q And this document was dated?

7 A May 11, 2009.

8 Q Now, you've said you visited the industries along
9 that creek, Cabin Branch. How far is this particular
10 company, Valley Proteins, from say House of Raeford Farms?

11 A It's a couple of miles upstream.

12 Q Okay.

13 A I can't tell you precisely the distance. The
14 stream follows a convoluted path that I'd like to talk about
15 later and show the pathway of movement of water from the
16 headwaters, where this facility is, to downstream areas that
17 gather behind House of Raeford Farms.

18 Q Was there anything else in this document that you
19 found important in your survey or your site---

20 A (interposing) Can I take a moment to look through
21 and see---

22 Q (interposing) Sure. Sure.

23 A There's a compliance inspection report attached
24 dated April 22nd, 2009. The primary inspector is listed as
25 Linda Willis. And the site is listed as noncompliant for

1 stormwater. It's a question area.

2 There's another attachment that gives a summary of
3 the inspection. "Several outfalls where stormwater is being
4 discharge [sic] from the facility are not being accounted for
5 in the site plan." There were a variety of listed issues
6 associated with that inspection indicating noncompliance on
7 the part of the facility.

8 There's also another attachment that is a check-
9 list type of document for reporting compliance. They talk
10 about the various outfalls that exist and problems associated
11 with offal open tank truck staging area and concern about the
12 outfalls not being clearly marked for the compliance of the
13 site plans and the exit points of the property into different
14 outfall areas of the site.

15 Q On the last page of the document under Permit and
16 Outfalls--and then there's a--there's room down there for
17 comment. Are you looking at that?

18 A Yes, I am.

19 Q That next to the last sentence there, will you
20 read that?

21 A That last section starting "Comment"?

22 Q Well, the next to the last sentence.

23 A The next to the last sentence: "This type of
24 discharge is considered an 'illicit discharge.'"

25 Q Okay. Did that mean anything to you?

1 A It meant that it was a significant problem in the
2 eyes of the state, that it was an unpermitted activity, and
3 it was allowing waste materials to leave the property under
4 stormwater conditions and enter surface water drainages
5 nearby.

6 Q Do you know what kind of business Valley Proteins
7 is in?

8 A I'm generally familiar with their process.

9 Q What do they do? Do you know?

10 A My understanding is that they are a rendering
11 facility. They accept offal, which is the waste products
12 from slaughtering of animals, as Mr. Howard testified about
13 yesterday. They render that material down through a variety
14 of processes that I'm not very familiar with. They make
15 other products that they can sell, including things like
16 animal feed, dog food, and things of that nature.

17 From that process they also have a wastewater
18 stream that comes from their operations. And they have a
19 lagoon--a series of lagoons and a nondischarge permit to
20 spray irrigate on adjacent lands their effluent in a similar
21 manner to what House of Raeford uses for their facility.

22 Q If they bring in animal by-product from various
23 slaughterhouses and animal operations, what kind of waste-
24 water would a company like that produce?

25 A I believe because they accept a lot of the

1 products generated by House of Raeford Farms, then they would
2 be treating materials that are of a similar nature to what is
3 in House of Raeford Farms' wastewater stream including blood,
4 various entrails of animals, and other waste products asso-
5 ciated with processing and killing chickens.

6 Q So what would their wastewater include?

7 A Well, their wastewater would probably be a very
8 similar process to what House of Raeford Farms has. They
9 would have fatty wastes. I'm sure there would be manure
10 related to some of this stream, intestinal discharge from the
11 animals during the slaughter process, things of that nature.
12 It's not very pleasant.

13 Q Thank you. Let me hand you another document,
14 which will be Number 12.

15 The Reporter: 14.

16 Mr. Jones: 14.

17 (Petitioner Exhibit 14 was
18 marked for identification.)

19 By Mr. Jones:

20 Q All right. Mr. Holley, who supplied this document
21 to you?

22 A I believe this was in one of those document
23 productions that I referred to on that list that I read
24 earlier.

25 Q Okay. And what does this document represent?

1 Q Have you seen this document before?

2 A I have.

3 Q Was this document turned over to you by counsel
4 for---

5 A (interposing) Yeah.

6 Q ---Petitioner?

7 A Yes, it was.

8 Q What does this document reveal?

9 A It is a letter written by Mr. Eric West, the
10 Duplin County district conservationist for the Natural
11 Resources Conservation Service, addressed to Linda Willis and
12 Jean Conway of the Division of Water Quality.

13 It's intended, I believe, to convey on behalf of
14 Mr. Robert Poindexter of the Carolina By-Products facility
15 efforts that the Natural Resources Conservation Service has
16 undertaken to help facilitate and improve drainage of storm-
17 water away from the Carolina By-Products facility.

18 Q Okay. And how did you use this in conducting your
19 study?

20 A I recognized that there was some survey work to
21 help establish some pathways of drainage of some of the local
22 ditches and that he's giving a sketch map that shows the
23 drainage patterns in the area in the headwaters of Cabin
24 Branch.

25 He also described how "the volume of standing

1 water in this drainage system has been improved by removal of
2 beavers and beaver dams obstructing the flow of water. The
3 Beaver Management Assistance Program (BMAP) was employed to
4 trap the creek from the railroad to Highway 117." So this is
5 the downstream area between the railroad tracks and the
6 headwaters of Cabin Branch toward Highway 117.

7 Q Would it help you to show where that is on the
8 drawing we've got?

9 A Yes, it would.

10 Q Why don't we do that?

11 (Witness approaches photograph.)

12 A It may not be illustrated on this map.

13 Q How about this one over here, the smaller one?

14 A Yes, that one would.

15 Q First of all, point out to the Court where Valley
16 Proteins would be.

17 A Yeah. This (indicating) is the Carolina
18 By-Products/Valley Proteins facility. For reference this is
19 Highway 117 running north and south (indicating). This is
20 the railroad tracks (indicating), and this is the headwaters
21 of Cabin Branch (indicating).

22 Q Now, where would the beaver dams have been that
23 they refer to in this letter?

24 A In that letter they refer to removing beaver dams
25 between the railroad tracks here (indicating), which is

1 downstream of Carolina By-Products, in the Highway 117
2 culvert or bridge, so the stretch in between those two.

3 Q And where is House of Raeford?

4 A House of Raeford is up here (indicating) to the
5 north.

6 Q So all that is upstream from House of Raeford?

7 A All of it is upstream from House of Raeford.

8 Q Now, why is there any concern about beaver dams
9 along that stretch?

10 A Can I sit down, sir?

11 Q Sure, absolutely.

12 A Beavers are creatures, as most of us know, that
13 have a tendency to cut down trees and limbs and build dams to
14 impound water areas to make better habitat for them. They do
15 create significant drainage problems for creeks of this
16 nature by impounding large areas and causing excess water
17 buildup in upstream areas from their structures.

18 And that can cause flooding. It can cause stagna-
19 tion of water. It also makes water back up into ditches in
20 the area and makes stormwater runoff be problematic in areas
21 where beavers have become prevalent.

22 Q You traveled areas of this creek in doing your
23 study. Did you see any evidence of beaver damming in that
24 area?

25 A In 2011 I saw what appeared to be--and I'm not an

1 expert on beavers, but what appeared to be a lot of logjams
2 and fallen logs that could very well have been renewed
3 efforts by beavers to block up some of the area close to the
4 railroad tracks downstream of Carolina By-Products.

5 Q Okay. Was there anything else significant about
6 this particular letter?

7 A It says that "beaver management maintenance will
8 be an ongoing necessity as well as the removal of small
9 obstructions from drains that limit water flow in order to
10 maintain function." I think that was a pertinent statement.

11 Q And why is that?

12 A It shows that there was a lot of poor stormwater
13 flow from the Carolina By-Products facility in tracking of
14 their runoff and impounding it into the broad, open areas and
15 the headwaters of the creek. And that was not facilitating
16 proper drainage and helping to avoid flooding and the like.

17 Q I'm going to hand you Number 16.

18 (Petitioner Exhibit 16 was
19 marked for identification.)

20 Q Have you seen this document before?

21 A I believe I have, yes.

22 Q And what is this document, Mr. Holley?

23 A This is another document that was included in the
24 production on the list that I read through. It's a letter by
25 Carolina By-Products, Mr. David Frey, General Manager, dated

1 June 26, 2009 addressed to the Division of Water Quality. It
2 is the stormwater discharge monitoring report, and it
3 includes an attachment of some sample results for their
4 facility for 2009.

5 Q And did you use this document in doing your study?

6 A I did. I did consider it.

7 Q What was significant about this in your study?

8 A It shows a continued record in June of 2009, when
9 they did the sampling, of elevated fecal coliform bacteria in
10 their stormwater runoff.

11 Q Do you know what the area would have been where
12 this condition would have occurred?

13 A It includes several monitoring points. There are
14 a number of outfalls that were marked on a map previously,
15 some of which discharge into Cabin Branch. And so it would
16 have characterized water that was running off the property
17 and entering the headwaters of Cabin Branch.

18 Q Do you remember when the episode was that the
19 state came and investigated House of Raeford?

20 A Yes. I believe that investigation began after an
21 anonymous phone call on September 9th. I believe they first
22 visited the site approximately September 10th.

23 Q And this letter was written before---

24 A (interposing) This predates that investigation,
25 yes.

1 Q Was there anything else significant about this
2 correspondence to you?

3 (Witness peruses document.)

4 A I don't see anything at the moment.

5 Mr. Jones: 17.

6 (Petitioner Exhibit 17 was
7 marked for identification.)

8 Q Do you recall seeing this document, Mr. Holley?

9 A Yes, I believe so.

10 Q What is this document?

11 A It is a laboratory report from the North Carolina
12 Division of Water Quality Laboratory Section presenting
13 results of some sample analyses collected by Ms. Linda
14 Willis. It appears that it was a surface water sample. And
15 the report is dated October 6, 2009.

16 Q So this would have been a month after the episode
17 with House of Raeford?

18 A Let's see. The date of the report is. I'm trying
19 to verify the date of the sample collection. The sample was
20 collected on September 24th, 2009.

21 Q So a few weeks?

22 A A few weeks after they began their investigation
23 of the incident downstream.

24 Q Was this document significant as you did your
25 study?

1 A I found it to be very helpful, yes.

2 Q And why is that?

3 A Well, it showed especially the results of dis-
4 solved oxygen monitoring in the stream in an area upstream
5 from the House of Raeford Farms facility. And the dissolved
6 oxygen was shown to be very, very low.

7 Q Where are you talking about there?

8 A If you will flip to the third page at the bottom,
9 near the bottom of the lab report in tabular form there's a
10 DO designation. That stands for dissolved oxygen. And a
11 handwritten number is put in by the laboratory in that space,
12 1.01 mg/l, which means milligrams per liter.

13 Q What does that mean to you?

14 A Well, the standard for proper dissolved oxygen
15 conditions for this type of surface water is 4 milligrams per
16 liter, so it shows significantly below the standard for dis-
17 solved oxygen at that time.

18 Q So this violated the state regulatory---

19 A (interposing) Yes.

20 Q ---standard?

21 A Yes.

22 Q And this was at or around Cabin Branch?

23 A This says "Carolina By-Products RXR," which I
24 interpret to mean the railroad tracks, where Cabin Branch is
25 at the railroad tracks.

1 Q Anything else significant about this?

2 A There are some other pages. Let me flip through
3 those quickly.

4 Q All right.

5 (Witness peruses documents.)

6 A There's a variety of lab parameters that they
7 measured and monitored. There is another full set of a
8 report dated September 24th. This is, I believe, the--it
9 begins on the fourth page of the attachment you handed me,
10 September the 25th, 2009, a sample collected by Linda Willis,
11 surface water, river/stream.

12 Q What did you find significant about that report?

13 A That location on the actual lab report prepared by
14 the laboratory, which is the sixth page, you'll see a desig-
15 nated sample location. It says "DW ditch at bend." And this
16 is a location behind the--I believe this is behind the Duplin
17 Winery facility. And they list in the dissolved oxygen box
18 the DO value is 0.35 milligrams per liter, so very, very low
19 dissolved oxygen.

20 Q That's even lower than the one in the previous
21 report?

22 A That's correct.

23 Q And that one is also noncompliant in terms of---

24 A (interposing) Correct.

25 Q ---the state regulatory standard?

1 A Yeah.

2 Q Anything else that you found significant about
3 this report?

4 A Let me keep looking through.

5 Q I'm not trying to force feed or anything. I just
6 want to make sure---

7 A (interposing) No, that's okay. I mean there's
8 several sets of analyses. I reviewed a lot of these types of
9 analyses through the documents that were provided for me.
10 And some of them were included in some summary maps that I've
11 prepared that I'd like to look at eventually.

12 If you'll flip further along, there's a subsequent
13 lab report for samples collected on September the 24th, 2009
14 by Linda Willis. This is behind, I believe, the Duplin
15 Winery facility.

16 It says--Yellow Cut Road, south ditch is the
17 sample location given. At that location it says, "No stats
18 collected," so there's nothing to remark on with that one.

19 (Witness peruses document.)

20 There seem to be no other real substantial results
21 in the rest of this lab report pertinent to the discussions
22 we're having.

23 Mr. Jones: Your Honor, it might be an
24 idea--we've got one more set of documents similar to this,
25 but this might be a good place to break.

1 The Court: Okay. Let's take about a ten
2 minute break, please.

3 The Reporter: Off the record. 11:21 a.m.
4 (A brief recess was taken.)

5 The Reporter: On the record. 11:33 a.m.

6 The Court: This hearing will come to
7 order. It's now 11:31 on October the 26th, 2011 and all
8 parties present when we recessed are again present. Mr.
9 Jones.

10 Mr. Jones: Thank you, Your Honor.
11 (Petitioner Exhibit 18 was
12 marked for identification.)

13 By Mr. Jones:

14 Q Number 18 is a document I'm sending up, Mr.
15 Holley.

16 (Pause.)

17 Q Do you recognize this document?

18 A I do.

19 Q And what does this document represent?

20 A It's a compliance inspection report issued by the
21 North Carolina Division of Water Quality to Duplin Wine
22 Cellars, Incorporated.

23 Q Okay. Show me on the map where Duplin Wine
24 Cellars is.

25 (Witness approaches photograph.)

1 A Yes, sir. The Duplin Winery facility is right
2 here on Yellow Cut Road, right adjacent to Carolina
3 By-Products.

4 The Witness: Can you see that, Your Honor?

5 The Court: I can.

6 A Right here (indicating).

7 The Reporter: Yellow Cut?

8 The Witness: Yellow Cut Road is the road
9 that comes in front of (indicating)---

10 The Reporter: Thank you.

11 The Witness: Yes. I believe it is two
12 words.

13 (Witness returns to stand.)

14 By Mr. Jones:

15 Q Do you happen to know what Duplin Wine Cellars is?

16 A I believe that they are a wine producing facility.
17 Duplin County has become known for its wine production, and
18 this is one of the facilities that does that.

19 Q Do you know what kind of production facility they
20 have?

21 A I believe they're involved in manufacturing wine
22 and bottling wine.

23 Q So did you get a view of their plant and their
24 complex?

25 A I observed them briefly from the road and was able

1 to look in behind from the road and see where their waste-
2 water lagoon system was that was referenced in some of the
3 inspection reports. And I've seen it on area photographs.

4 Q Now, the compliance inspection report before you,
5 did you use this in your study of that area?

6 A I believe I did, yes.

7 Q What did you find in here that was significant to
8 your study?

9 A Well, the inspection date is April 21st, 2009.
10 The primary inspector is Linda Willis and the secondary
11 inspector is Jean Conway. On the front page there's a box
12 that's blacked out that says "Not Compliant," so they are
13 referencing that the facility is not compliant. And then
14 question areas are flagged as stormwater.

15 And then there's an attached page with a comment
16 written on it. And under the comment it says:

17 "The facility has been discharging a wastewater
18 from their wine processing operations to a lagoon
19 with an overflow structure that discharges to the
20 ditch behind the facility. The ditch is part of
21 the headwaters to Cabin Branch. The ditch travels
22 to the west to the train tracks, turns north, and
23 empties into a wetland that is the headwaters [of]
24 Cabin Branch." DO"--

25 --which I take it means dissolved oxygen--

1 "DO was taken in the stream and was 0.5 milligrams
2 per liter. The ditch was full of black septic
3 wastewater with putrid odor."

4 Q Now, I assume that DO level was noncompliant?

5 A That's my understanding, yes.

6 Q That's a pretty low DO level?

7 A It's very low, yes.

8 Q Then that last sentence, "The ditch was full of
9 black septic wastewater with putrid odor." What does septic
10 mean?

11 A Septic is a term that relates to, I believe,
12 decay. It's often associated with a description of sewage.
13 We talk about septic tanks where wastewater is breaking down
14 via microbial activity. It's a similar term.

15 Q Had you ever seen that terminology before, "septic
16 wastewater"?

17 A I saw in some other documents that describe the
18 nature of the material behind the House of Raeford Farms
19 facility in Cabin Branch. That same "septic" appearance was
20 used there.

21 Q And this was several months prior to the
22 investigation of House of Raeford Farms?

23 A Yes, this was in April of 2009.

24 Q Anything else significant about this report?

25 A Not that I recall.

1 Q Okay, but you did include this in your study.

2 A I did.

3 Q I'm going to hand you Number 19.

4 (Petitioner Exhibit 19 was
5 marked for identification.)

6 Q Do you recollect seeing this document before?

7 A I do.

8 Q Was this included in your study?

9 A It was.

10 Q What was significant about this report?

11 A This was another compliance inspection report
12 performed by Linda Willis and this time Rick Shiver. It was
13 an inspection of the Duplin Wine Cellars facility and it was
14 dated--the inspection date was June 23rd, 2009, so several
15 months prior to the investigation of the House of Raeford
16 Farms are, and on the front page a similar comment as the
17 previous inspection report for this facility.

18 The facility status is noncompliant--not
19 compliant; I'm sorry. And the question areas are stormwater.
20 And then there's an attached summary, and the summary has a
21 description of the conditions that they observed that was
22 allowing wastewater from that facility to enter the ditch.
23 They describe the process of the grape squeezing and the
24 various wastewater aspects to this operation. And then they
25 say late in that--let's see.

1 (Witness peruses document.)

2 A Six lines up from the bottom of that paragraph it
3 says, "The ditch again was full, but no samples were taken.
4 The consultant and Mr. Fussell were informed that the
5 discharge must be discontinued and they need to resolve their
6 wastewater discharge issues," and at the end of that
7 paragraph, "The greatest volumes are generated during the
8 grape season, August-November." So this, to me, indicated a
9 recurring problem with the same wastewater discharge to the
10 ditch behind their facility.

11 I also note that it's written---

12 (Witness peruses document.)

13 I missed it now. The sixth line down, one, two,
14 three, four--the sixth line down, "The lagoon out back is a 2
15 bay lagoon with the first bay very dark (septic looking) in
16 color." There's that term again.

17 Q What sort of wastewater treatment system does
18 Duplin Wine Cellars--do they have?

19 A At that time my understanding is it was a lagoon
20 system, that the process generates approximately 7500 gallons
21 of wastewater per day which gets pumped to the lagoon and to
22 a septic system. And they were--at the time of the inspec-
23 tion they were--the state was provided some analyses on the
24 wastewater in the lagoon.

25 Q What sort of wastewater system did Valley Proteins

1 have?

2 A A lagoon system with spray irrigation, similar to
3 the one at Carolina--I'm sorry, at House of Raeford Farms.

4 Q Is there anything else significant about this?

5 (Witness peruses document.)

6 A Yes. Seventh line up from the bottom it says,
7 "The inspector and supervisor walked to the ditch in line
8 with the overflow structure and witnessed a discharge to the
9 ditch." That was the point I meant to bring out earlier when
10 we were looking.

11 Q What does that tell you?

12 A There was an ongoing point source discharge going
13 into the ditch.

14 Q On June the 23rd?

15 A That's correct, June 23rd, 2009.

16 Q All right. Go to the last page.

17 (Witness complies.)

18 Q Did you review the comments on the last page?

19 A I did.

20 Q Was that significant?

21 A Yes, because there was a lack of understanding in
22 that bottom comment. It says:

23 "The facility still had a discharge from their
24 lagoon that takes wastewater from the winery. The
25 contacts (Geno Kelly and Patrick Fussell) did not

1 A Yes, sir, I do.

2 Q What do you recall about this document?

3 A It is a compliance inspection report listing the
4 results of an inspection dated July 7th, 2009 of the Duplin
5 Wine Cellars facility on Yellow Cut Road. The primary
6 inspector was Kipp Glazier, G-l-a-z-i-e-r. It says it was a
7 routine inspection. The question area that's listed on the
8 first page is stormwater.

9 (Witness peruses document.)

10 A There's not a lot of detail given from Mr.
11 Glazier's inspection report like the previous reports. He
12 doesn't summarize what his issues were with regard to
13 stormwater being a question area. But it evidently was still
14 an issue that was worthy of him noting as an area of question
15 from his inspection.

16 Q Do you know what a stormwater discharge COC is?

17 A Contaminant of concern, I believe, is what the COC
18 acronym stands for.

19 Q Anything else significant about this report?

20 A No. This is a very limited report. There's not a
21 lot of information in it.

22 Q Okay, and Number 21.

23 (Petitioner Exhibit 21 was
24 marked for identification.)

25 Q Have you seen this document?

1 A I have.

2 Q What is this document?

3 A It's a compliant inspection report by the North
4 Carolina Division of Water Quality. The primary inspector
5 was Ms. Linda Willis. The inspection date was September
6 23rd, 2009.

7 Q And did you use this in doing your study?

8 A I did.

9 Q And what did this document contribute to your
10 study?

11 A This document showed continued noncompliance
12 issues within a matter of weeks following the investigation
13 of the area of Cabin Branch behind House of Raeford Farms.
14 Ms. Willis found that at the time, on September 23rd, that
15 this facility was not compliant, and the question area
16 remained stormwater. On the subsequent page in the comments
17 it says:

18 "The illicit discharge from the lagoon appeared to
19 have been removed. However, the ditch was full of
20 wastewater again. Carolina By-Products personnel
21 requested sampling of the ditch that crosses their
22 property to protect their interests concerning the
23 origin of the wastewater."

24 Q Anything else in the report?

25 A Well, it talks a little bit about the direction of

1 flow in through the ditches, heading into different
2 directions, nothing of great significance there.

3 Q The last sentence--I'm sorry, the last two
4 sentences says, "Highway 117 ditches are not connected to the
5 ditch behind the winery. The ditch was flowing towards the
6 west."

7 A "Towards the west," that's correct.

8 Q Did that indicate anything to you?

9 A Well, it was consistent with the earlier diagrams
10 that showed that the ditches coming behind the Duplin Winery
11 facility drain to the west, where they join up with a ditch
12 paralleling the railroad tracks that's between Carolina
13 By-Products and the Duplin Winery facility. And then that
14 flow turns and runs parallel to the railroad tracks to the
15 north where it enters a broader section of water that's the
16 headwaters of Cabin Branch.

17 Q And then Document 22---

18 (Petitioner Exhibit 22 was
19 marked for identification.)

20 Q ---is before you. Do you recall this document?

21 A I do.

22 Q Was this turned over to you following discovery
23 from the State---

24 A (interposing) Yes, it was.

25 Q ---to counsel?

1 A Yes.

2 Q Did you include this in your study?

3 A I did.

4 Q And how is this important?

5 A Well, this is a compliance inspection report
6 similar to the ones we've been talking about where the Duplin
7 Wine Cellars facility was inspected again. The inspection
8 date here is September 24th, 2009, so it's the following day
9 to the report that we just looked at.

10 Linda Willis is the primary inspector and
11 Christopher Baker is the secondary inspector. The facility
12 status is listed as not compliant. Question areas are
13 stormwater on the front again. The subsequent page has some
14 details of some evaluations that they performed. It says
15 that:

16 "This site visit was to oversee the sampling
17 locations of Envirochem and for DWQ to secure
18 samples for sulfides. The winery had installed a
19 new lagoon. The old discharge pipe from the
20 lagoon was lying next to the ditch where it had
21 previously been buried to provide a discharge
22 outlet for the lagoon. The lagoon did not appear
23 to have any overflow pipes. The waste remains in
24 the ditch. Supervisor for the region wanted to
25 wait on analyses before determining further

1 Tharrington.

2 The facility status is listed as not compliant.

3 Question area is Other, as listed on the front. The

4 inspection summary on page 2 is that:

5 "The ditches around the property were inspected
6 for wastewater. In the past, wastewater had been
7 directly discharged to the ditch behind the
8 facility. This ditch leads to a wetland to the
9 north and west of the Duplin Winery... . This
10 wetland drains to Cabin Branch in Cape Fear River
11 Basin."

12 Q Okay. Why did you feel that was significant?

13 A Well, it shows an understanding of the continued
14 impact or the previous impacts to Cabin Branch associated
15 with discharges into the ditch that eventually lead into
16 Cabin Branch upstream from the House of Raeford Farms
17 facility.

18 Q Any other thing of significance here?

19 A The facility--under the Other section it says:
20 "This facility continues to operate without
21 coverage under NPDES [permit]. Pictures were
22 taken. A pipe seen in a lagoon during this
23 inspection became missing during the September
24 15th, 2010 inspection. A buried pipe with an
25 outlet to the ditch approximately 100 yards from

1 not compliant. Question areas are Other. And on page 2 is a
2 summary. The summary says,

3 "[The] site inspection was the result of a citizen
4 complaint about Duplin Winery (see e-mails
5 received by DWQ WiRO from Mr. Currituck). The
6 allegations were that there were illicit
7 discharges to the ditch from the winery. Linda
8 Willis and Rick Shiver inspected the site
9 (unannounced). The pipe in the ditch noticed
10 during the July 22nd, 2010 investigation was still
11 uncapped, and there was water in the ditch behind
12 the pipe outlet and in the connecting ditch
13 perpendicular to the receiving ditch which drains
14 to a wetland located northwest of the winery. The
15 water in the ditch had a septic appearance. DWQ
16 requested that the Duplin Winery take samples at
17 two locations behind their lagoon. Parameters for
18 analyses requested were BOD-5 Day, COD, and
19 nutrients. The Regional Supervisor requested the
20 winery hire a consultant (engineer) to map out all
21 the floor drains/piping in the facility to
22 determine the location of their outlets. Pictures
23 were taken (on July 22nd, 2010 by staff) of the
24 piping inside the pump house showed two stubs for
25 connection to the filters."

1 I'm not going to continue to read the whole thing.

2 Q Do you recall anything else of significance in the
3 comments?

4 A Give me a moment.

5 Q All right.

6 (Witness peruses document.)

7 A Yes. Four lines--five lines up from the bottom:
8 "A notice of violation was issued to Duplin Winery
9 on October 15th, 2010 concerning the issues found
10 at the facility on September 15, 16 and 20, 2010
11 requesting an explanation for the underground pipe
12 and why the wastewater level was below the
13 effluent pipe riser. The facility has yet to turn
14 in an application for permit coverage under NCG060
15 for the wine facility on Yellow Cut Road."

16 Q Okay. What does this mean to you?

17 A Well, it suggests to me that despite previous
18 inspections and instructions to the facility, they still were
19 not doing the steps that it took to eliminate the problem
20 that was ongoing and to obtain the necessary permits for the
21 type of discharge.

22 Q When you say ongoing, you mean going back to 2009?

23 A Yes.

24 Q Do you understand the physics there where it says,
25 "requesting an explanation for the underground pipe and why

1 the wastewater level was below the effluent pipe riser"?

2 A I have a hard time really visualizing that, but I
3 would imagine they're referring to some aspect of the waste-
4 water system, that the elevation was a concern for allowing
5 discharge of their grape wastes into the ditch.

6 The Reporter: 25; is that correct?

7 Mr. Jones: That's correct, Number 25.

8 (Petitioner Exhibit 25 was
9 marked for identification.)

10 Q Document Number 25 is before you. Did you see
11 this in conjunction with the study you undertook?

12 A Yes, I did.

13 Q And of what significance was this?

14 A This is the October 15, 2010 notice of violation
15 issued to Duplin Winery by the North Carolina Department of
16 Environment and Natural Resources, Division of Water Quality.
17 It describes in some detail the results of the inspection on
18 September 15th of 2010 by Linda Willis and the results of
19 that study that were the basis for their notice of violation.

20 In the second paragraph, I found it particularly
21 interesting that it says, "Ms. Willis also measured the
22 physical parameters of what appeared to be wastewater, and
23 the dissolved oxygen measures 0.6 milligrams per liter, which
24 confirmed that whatever was in the ditch was septic."

25 Attached to the letter is supporting documentation

1 of the work done. There's a laboratory report from the North
2 Carolina Division of Water Quality Laboratory Section that
3 summarizes some of the chemical analyses performed.

4 Q Anything of significance in that to your study?

5 A Well, it shows--it shows a somewhat elevated
6 chemical oxygen demand and a BOD, which means that a break-
7 down of the waste will tend to consume oxygen.

8 Q How about the pictures on the back?

9 A Yeah. There's some pictures in black and white--
10 I don't believe I ever received color photos of these--that
11 apparently show aspects of the lagoon that were inspected.
12 Having not been there and seen this facility in detail, I
13 have a hard time trying to comment on what's shown.

14 Q This notice of violation that's dated October the
15 15th, is there any consistency with conditions found on the
16 property that bring back recollections from 2009?

17 A Well, they were citing them for the same issues
18 that they had identified in earlier inspection reports of
19 having black, putrid wastewater in the ditch adjacent to
20 their stormwater--or their wastewater handling facility.

21 This is a culmination, I believe, of an ongoing
22 problem that predated the House of Raeford Farms investiga-
23 tion and continued up until October of 2010, when they were
24 given a notice of violation.

25 Q Now, Mr. Holley, you also looked at the site of

1 House of Raeford Farms?

2 A Yes, I did.

3 Q Okay. And you actually walked to and observed the
4 lagoon 1 and lagoon 2---

5 A (interposing) Yes, I did see those.

6 Q ---on their site. Did you have occasion to
7 measure the measurements and distances involved in those
8 lagoons in relation to the creek?

9 A I did not measure those in the field. We utilized
10 aerial photographic data from the geographic information
11 system to try to scale off and approximate the sizes of those
12 individual lagoons and the distance from the primary lagoon
13 to the closest point on Cabin Branch.

14 Q Is this something that you do routinely in your
15 business?

16 A Yeah. We have geographic information system
17 trained personnel who offer that service as a part of our
18 company. And they download the various available public data
19 bases and help manipulate that information for us in our
20 studies.

21 Q As a result of using that to conduct your study,
22 did you arrive at some sort of measurement for the size of
23 lagoon number 1?

24 A I did. I don't recall the exact numbers off the
25 top of my head, but I recall that the width is approximately

1 329 feet. The length is a little over 700 feet. And I
2 believe that primary lagoon comprises approximately 6 acres
3 of area.

4 The secondary lagoon had a similar width. I
5 believe it was 320 or so feet wide and approximately 700 feet
6 long, but it is not a rectangular. It has a pie shaped area.
7 As you approach Cabin Branch, it reduces its area. And when
8 we calculated the area of that, I believe it was a little
9 over 5 acres. I have it written down on a piece of paper.
10 If you need it in detail, I brought it with me, but I just
11 don't have it up here.

12 Q Now, you traveled the creek on a couple of
13 occasions, I think you said, in January and April of 2011?

14 A '11, correct.

15 Q Okay. Do you recall, when you were there in April
16 of 2011, what the flow of the creek was there behind the
17 House of Raeford plant?

18 A I do.

19 Q What was that like?

20 A It was--it had very low flow conditions. The
21 water was quite stagnant in that area is one way I would
22 describe it.

23 Q What would have contributed to that? Why would
24 that have been?

25 A This region of Cabin Branch is classified as

1 Class C swamp waters, which are characteristically low
2 gradient streams. That means they have a very small
3 elevation change on them. They tend to have low volumes of
4 flow. They tend to be subject to impounding and backing up
5 and low flow conditions.

6 But specifically at that location behind the House
7 of Raeford Farms, I recognized that there were some specific
8 aspects of the stream channel changes that help contribute to
9 the nature of the flow characteristics in that location.

10 Q What were those characteristics?

11 A As you approach the secondary lagoon and go just
12 beyond the secondary lagoon approaching the Parker Bark
13 facility, the stream has been modified. It is not a natural
14 stream channel. As a matter of fact, it may have been
15 modified further upstream, but it was dramatically modified
16 immediately downstream of the secondary lagoon of the House
17 of Raeford Farms facility. That modification involves a
18 dramatic turn to the east at a near 90 degree angle---

19 Q Why don't you show what you're talking about
20 there?

21 A Can I show on my slides?

22 Q Sure, sure.

23 A You want me to--okay. Okay. So here is an aerial
24 photograph of the area surrounding the House of Raeford Farms
25 facility. And on this--let's see if I can use this touch

1 screen. Here's the--in this orange star that I just blotted
2 out is the House of Raeford Farms facility. You can see
3 Carolina By-Products down here to the south (indicating) and
4 Duplin Winery just a little bit east of that facility
5 (indicating).

6 Cabin Branch is shown near its headwaters flowing
7 from the railroad track area toward US 117. Beaverdam Branch
8 occupies an area to the north of the House of Raeford Farms
9 facility and it's fed by a large lake, which you see here
10 (indicating), which is Johnson Lake. It's an impounded
11 feature where there's an actual dam. This is dammed up water
12 in that region. And Beaverdam flows downstream to Sheffield
13 Road bridge, right there (indicating)--I just put a blue
14 dot--where they converge.

15 And you can see Beaverdam Branch continues further
16 downstream where eventually it meets up with another creek
17 called Maxwell Creek, which is I believe here (indicating).
18 It would actually be flowing the other way. And also I'm
19 highlighting the location of Magnolia School because that was
20 a point that I was given access to look at and inspect the
21 upstream section of the creek.

22 Q You were referring to the characteristics of the
23 bends, though, that---

24 A (interposing) Yes.

25 Q ---contributed to the lack of flow there.

1 A Correct. As you approach the Parker Bark
2 facility, there are large ponds--you can see those right in
3 here (indicating)--immediately downstream of the facility.
4 Those ponds are abandoned limestone quarries is my under-
5 standing from an interview with folks with House of Raeford
6 Farms. There had been a former quarry operation that mined
7 limestone that occurs shallow, close to the land surface, and
8 was excavated and mined out over a particular area.

9 At the conclusion of that mining and to support
10 that mining, they undoubtedly would have had to channelize
11 and turn the flow of the stream as it approached their
12 property and divert it around the active mine. It would be
13 very difficult to maintain a quarry operation if there's a
14 stream flowing water into it. You have to pump excess water
15 to keep it dry enough to mine the product.

16 Q Where are those big ponds on that aerial view?

17 A I can show them better on this blow-up here.

18 (Witness approaches photograph.)

19 Q All right.

20 A I believe this one shows it best. So the
21 abandoned quarry facility includes these two ponds that are
22 connected by a small isthmus and a breach that connects these
23 two ponds. These are the abandoned quarries (indicating).

24 As the stream parallels the secondary lagoon and
25 comes up at this point (indicating), it becomes dramatically

1 channelized and shifted off to go around a portion of this
2 smaller pond on the east side of that facility. Eventually
3 that stream opens up into the actual pond. So the channel no
4 longer exists as a narrow feature. You actually have the
5 stream going into and discharging into this large pond.

6 This pond, my guess from looking at aerial
7 photographs and scaling it roughly, is that from this island
8 area, this isthmus, over across is about 350 feet wide. And
9 the stretch of the creek that you must pass through the pond
10 is about 200--a little bit over 200 feet long before. On the
11 exit side of that pond, it will become a narrow stream
12 channel once again.

13 (Witness returns to stand.)

14 Q How does this contribute to the flow from the area
15 behind the House of Raeford?

16 A Okay. In basic groundwater hydrology, you learn
17 that calculating the discharge of a stream is--can be done by
18 a simple equation. I kind of wish I had a blank screen I
19 could do this with.

20 Ms. Jones: Pull that cord out.

21 The Witness: Pull the cord out?

22 Ms. Jones: Uh-huh.

23 The Witness: Okay.

24 A So on this screen, Q--you can see how bad my
25 handwriting is there--equals V times A. Q represents the

1 discharge volume of the stream. That's the amount of water
2 the stream is transporting throughout its course. V repre-
3 sents the velocity. That's the rate at which water moves
4 through that channel. And A is the cross-sectional area of
5 the stream.

6 So you can calculate the cross-sectional area by
7 saying how wide is the stream and how deep is the stream.
8 You can multiply those two, if it's a nice rectangular shaped
9 channel, to calculate the area. Hydrologists all the time do
10 this type of profiling of the cross-sectional area of a
11 stream so they can evaluate the flow rates and the volumes of
12 water carried by streams.

13 Well, notice in here that A is the cross-sectional
14 area of the stream channel, width times depth. When you have
15 a narrow stream--let's say it's on the order of 20 or so feet
16 wide and 5 to 10 feet deep--that's a very limited area
17 through which the water must pass.

18 If you change that value of A to open up into a
19 350 foot wide feature that is now much, much deeper--I don't
20 quite know how deep that pond is--you've dramatically
21 increased the value for A in this equation. When that
22 happens, velocity drops to a minuscule amount.

23 This pond is a stagnant feature. It is what we
24 call a base level. As water exits the narrow stream and hits
25 this large feature, the velocity must drop. That causes

1 backing up of water flow from that point and areas imme-
2 diately upstream.

3 Q So there is a natural characteristic there that
4 contributes to the lack of flow in that area of Cabin Branch?

5 A Absolutely. It is a function of the stream
6 entering a man-made feature that is this large lake. You no
7 longer have contained flow in a narrow stream channel
8 anymore. You have this broad, open lake that causes the
9 velocity of water flow to drop dramatically. And that's a
10 year-round occurrence that doesn't change.

11 Q And what is the general topographic feature of
12 this area?

13 A Okay. I have a slide that I can use to illustrate
14 that. Let me see if I can plug this back up again. Let me
15 undo my equation. There. Is that good?

16 I'm going to leave this slide and go to--oh, I
17 didn't--one other aspect of that is that red zone highlights
18 the area of investigation of the so-called sludge behind the
19 House of Raeford Farm facility in Cabin Branch. That's my
20 best approximation from the records I reviewed. It's
21 intended to be illustrative, not definitive.

22 Okay. Here is a slide that shows the elevation of
23 the land surface across this region. This is a product
24 generated by our geographic information system staff. It
25 incorporates LIDAR data, L-I-D-A-R. LIDAR data uses light

1 surveys from satellites orbiting the earth to take detailed
2 readings of the land surfaces. It bounces a light wave off
3 of a land surface. LIDAR stands for light range--I'm sorry,
4 light detection and ranging, I believe, is what the acronym
5 stands for.

6 What you'll see here is the warmer colors off to
7 the west up in this area (indicating) are high elevation,
8 approximately as high as 147 feet, which you'll see down
9 there. And the cooler colors off to the east in this area
10 (indicating) are as low as 50 feet elevation. So you have a
11 little bit less than 100 feet elevation change from west to
12 east within this view that I've presented.

13 Water flows downhill in stream systems. So what
14 you see is a tendency for rainfall events and other
15 activities in the headwater regions of these streams to work
16 its way from high elevation and collect together in stream
17 channels and flow to lower elevation areas. So generally,
18 the flow of streams is from west to east across this area
19 that we're looking at.

20 Q How does that influence the flow there at Cabin
21 Branch?

22 A Well, it has a dramatic influence on the flow in
23 Cabin Branch. And what I'd like to do is illustrate, if I
24 can, the path---

25 Q (interposing) Sure.

1 A ---that flow occurs from the headwaters of Cabin
2 Branch downstream to the area of the House of Raeford Farms
3 facility and a little bit beyond that and show you all the
4 different flow paths of the various streams so we can all
5 have a good understanding of the flow characteristics. So
6 I've got some little illustrative arrows.

7 So here's--coming off of the headwaters of Cabin
8 Branch section immediately downstream from the lagoon area of
9 Carolina By-Products, you'll see flow toward the north into
10 that adjacent swamp area and flowing underneath the railroad
11 tracks. Okay.

12 Flow from the west in ditches behind the Duplin
13 Winery that drain back toward the ditch parallel to the
14 railroad tracks carried that water then toward the north
15 where it enters the larger stream section of Cabin Branch,
16 which joins up with water coming from Carolina By-Products
17 drainage area. It then continues toward US 117 and
18 approaches the Highway 117 culvert.

19 Now, I'd also like to look at--to the north is the
20 Beaverdam Branch coming off of Johnson Lake, which is here
21 (indicating). Whoops, I pushed the wrong thing. This area
22 is Johnson Lake (indicating). So coming off of Johnson Lake,
23 working your way east, you have flow from the overspill of
24 the lake that contributes some water to the stream flow. You
25 could also have some base flow groundwater discharge that's

1 helping keep it flowing. That passes under US 117 and
2 parallels the Parker Bark facility on the north side and
3 continues to flow downstream.

4 Now, let's go back to the area where we have--
5 looking at Cabin Branch again. As Cabin Branch crosses under
6 117, it takes a turn to the east. It was flowing mostly
7 northeast. It takes a turn to the east, crosses under Brooks
8 Quinn Road, takes a sharp turn to the northeast, and then a
9 very sharp turn back to the northwest where it crosses Brooks
10 Quinn Road a second time as it approaches the House of
11 Raeford Farms facility.

12 Now, Beaverdam Branch is not a separate stream by
13 itself. It's also fed by unnamed tributaries, which the
14 state has done some measurements on and evaluated as part of
15 theirs, so I'm illustrating its flow. So as you approach
16 Sheffield Road on Beaverdam Branch, you pick up additional
17 flow from an unnamed tributary to the north that's flowing to
18 the south. All these are gathering up close as we approach
19 the Sheffield Road bridge.

20 Now, the last arrow that just came up adjacent to
21 the Carolina By-Products facility shows a generalized
22 designation of the direction of flow past the secondary
23 lagoons into the smaller pond of the quarry facility, the
24 abandoned quarry facility, exiting that location and becoming
25 a narrow channel again or a more confined channel again. It

1 joins up with flow from Beaverdam Branch right upstream of
2 Sheffield Road and continues beyond Sheffield Road to a down-
3 stream area.

4 Now, at this point it starts to pick up flow from
5 other tributaries, unnamed tributaries to the north, off of
6 Johnson Parker Road. And these streams were also looked at
7 by the Division of Water Quality and were evaluated. They
8 continue on their path and turn to the south and join up with
9 Beaverdam Branch. With that collective flow, they then cross
10 underneath Brooks Quinn Road, again heading to the east and
11 approaching Interstate 40.

12 Beaverdam Branch--the combined flow from that
13 whole system converging into Beaverdam Branch then crosses
14 underneath Interstate 40, where it eventually meets up with
15 Maxwell Creek. And you'll see Maxwell Creek is this sub-
16 stantial tributary off to the north that feeds in from areas
17 of the north. At that point it continues--I'm sorry; at that
18 point it heads off the page heading on its way toward the
19 Cape Fear River.

20 Q Now, from an elevation standpoint does that have
21 any bearing on how the flow slows down or stops behind House
22 of Raeford?

23 A Well, when elevation gradients are steeper, flow
24 will tend to be higher. And what drives velocity is the
25 hydraulic gradient of the stream. How much elevation change

1 there is can help accelerate the rate of movement.

2 Well, when you get to that large pond, it acts in
3 a similar manner to when a river meets the ocean. We're all
4 real familiar with our rivers in North Carolina and how as
5 our rivers drain to the east to the coastal plain and they
6 approach the ocean, the ocean is a constant level. The
7 velocity of our rivers slow down and the section of those
8 rivers become flooded with sea level water. And their
9 sediment load drops out and they change in their flow
10 dynamics.

11 The flow in the Pamlico River--if you're standing
12 below--the city of Washington is very, very low. It's a
13 tidally influenced thing. Well, this temporary base level of
14 that abandoned quarry pond is a somewhat similar manner.
15 There's no tidal influence on it, but it is a relatively
16 consistent elevation that changes--it responds slower to
17 inputs of new water because it has such large storage volume,
18 okay, so it slows down the flow of the stream as it
19 approaches that and enters that feature.

20 Q Are there any other characteristics in this area
21 that have affected the flow behind the plant?

22 A Well, the sharp turns in the stream that were
23 undoubtedly done by--I believe done by the quarry operation
24 to divert the creek; there are also a lot of deadfall trees
25 that tend to trap and slow down water flow in that area. But

1 all of those come together to trap floating material at those
2 locations.

3 And I think that's the important point that we
4 need to understand about the nature of flow in the system is
5 that the characteristics of water approaching that abandoned
6 quarry pond and the various aspects of change in hydrology
7 cause a condition that allows trapping of floating material,
8 whether it be trash, floating plastic bottles, duckweed,
9 aquatic vegetation, or in the case of the investigation that
10 was done behind that facility, it could include wastewater
11 type materials that have a buoyancy or float--ability to
12 float.

13 Mr. Jones: Your Honor, this might be a
14 natural break point as he heads into his next series of
15 slides, so---

16 The Court: Okay. That sounds excellent.
17 What we'll do is take a lunch break. I have it's about
18 12:23. Let's return here at 1:30, please. Thank you.

19 (The hearing was recessed at 12:23 p.m. to
20 reconvene at 1:30 p.m. this same day.)

1 it understood that that is an estimation from a geographic
2 information system map and it shouldn't be represented to be
3 survey accurate. This is an approximation. That comes out
4 to be approximately 6.09 acres of size.

5 And for the secondary lagoon the maximum length
6 was 790 feet and the width was 324 feet. The area was
7 calculated to be 5.25 acres, somewhat rounded, but
8 approximately 5 and a quarter acres. Once again, those are
9 not survey accurate numbers. They're approximations from an
10 aerial photograph using a geographic information system
11 program.

12 Q Thank you. And when we were closing up before
13 lunch, I think we cut you off there. You were talking about
14 characteristics in the area behind House of Raeford Farms---

15 A (interposing) Uh-huh.

16 Q ---and Parker Bark that led to levels of stream
17 flow behind the plant. Why don't you finish your thought
18 that you had before lunch?

19 A Okay. Well, one of the things that I was
20 attempting to describe is the nature of how flow converges at
21 that location. It is a culmination of water from all the
22 upstream areas of Cabin Branch to that position behind the
23 House of Raeford Farms facility.

24 One of the things that I do as a hydrogeologist in
25 looking at streams such as this one is I try to ascertain the

1 drainage basin dimensions. And the drainage basin is the
2 area that contributes water from surface flow after a
3 rainfall event, drains into the actual creek, and supplies
4 surface runoff. It's a topographic defined feature. It's an
5 elevation defined feature.

6 At this location the western margin of the Cabin
7 Branch drainage basin is this high elevation region back up
8 over here close to North Johnson Pond Road (indicating). And
9 then it follows this ridge line back on--just on the south
10 side of the Carolina By-Products facility, follows Yellow Cut
11 Road, follows Fire Tower Road, and then turns back to the
12 north and west slightly along that stretch of Sheffield Road
13 and converges right at the Sheffield bridge.

14 Now, the northern boundary is a little more
15 difficult to precisely define, but I've approximated it as
16 being along Johnson--Nash Johnson Road, this ridge line going
17 from west to east, and passing up into the Parker Bark
18 facility and converging at the Sheffield bridge right before
19 Beaverdam Branch comes into it. So that's roughly--I've got
20 this a little bit off on this side. It really should kind of
21 close up on that side. Forget this line.

22 This area--I've estimated the dimensions of that
23 area to kind of get a sense of the size of the drainage basin
24 that contributes flow after storm events to water that passes
25 that location in the stream. And I've come up with

1 approximately 5.6 square miles of drainage basin area for the
2 Cabin Branch streams basin.

3 The Beaverdam Branch streams basin, because it
4 extends so far to the north off of our mapping area that
5 we're trying to focus in on--it's much more expansive. And I
6 haven't tried to calculate the size of that drainage basin,
7 but suffice it to say it's much larger.

8 So that was--one of the points that I was trying
9 to get at was looking at how big of an area and what is the
10 area within that boundary of the drainage basin that would
11 typically contribute flow to the stream and add to the flow
12 that converges at that location behind the House of Raeford
13 Farms over here (indicating).

14 Q Okay. Any other items that you wanted to mention
15 to the Court that contribute to the flow level behind the
16 plant?

17 A Well, I think we were talking earlier about the
18 various things that affect the velocity of flow as it
19 converges behind the plant. One that we talked about was the
20 nature of the dimensions of the stream channel getting much
21 larger as you enter the quarry lake. Others were the nature
22 of the sharp turns and bends in the creek and the abundance
23 of fallen trees and logs that help to trap and restrict flow
24 throughout the area.

25 But ultimately after you pass the downstream area

1 where Beaverdam Branch joins the Cabin Branch and extends a
2 little bit past the Sheffield bridge is this large logjam
3 shown approximately there (indicating), just a short distance
4 downstream from Sheffield Road and the Sheffield bridge.

5 There's a large rotting log that's there now. You
6 can see it was in the photos from 2009. It appears that same
7 obstruction was there. It traps a tremendous amount of
8 floating debris, duckweed, trash. And I'll show you some
9 photographic evidence of its condition in 2011 when I
10 observed it to demonstrate that point.

11 Q So you have made a visit to the site. You've
12 reviewed the records from 2009.

13 A Uh-huh.

14 Q You've inspected the facility there at House of
15 Raeford and those others upstream. Did you make some
16 observations about the kinds of contributions that could be
17 made to the contents of the Cabin Branch around where the
18 plant is?

19 A Yes, I did. I did do some evaluations of the
20 locations of known and potential source contributors to
21 degrade water quality within the Cabin Branch drainage
22 system, keeping in mind that all nutrient loads or wastewater
23 that enters the stream in upstream areas eventually has to
24 pass by that position on the stream where the so-called
25 sludge was observed.

1 I've had some discussions that I'd like to go
2 through---

3 Q (interposing) Sure.

4 A ---that relate to a summary of some of the data we
5 just discussed and presented into evidence that relates to
6 the Carolina By-Products facility.

7 Q Why don't you go through the timeline that
8 shows---

9 A (interposing) Okay.

10 Q ---the upstream impact?

11 A Because I think this timeline I've organized takes
12 those pieces that we've looked at and helps to put them in a
13 chronology that we can look at. So I've called this the
14 timeline of noncompliance. This is just a summary of the
15 records that we've already discussed.

16 Stormwater monitoring that was conducted in March
17 of 2006, February of 2007, February of 2008, and January of
18 2009 at the Carolina By-Products facility revealed elevated
19 fecal coliform. Those were all consistent with them having
20 difficult problems with stormwater runoff from their waste
21 handling process.

22 Q Okay. And the footnote 1 there, is that your
23 reference for those---

24 A (interposing) Yes. At the end of this there's a
25 list of references that keys each of these points back to

1 specific documents that we've already looked at and
2 discussed.

3 April 16th, 2009, the site was inspected by the
4 NCDWQ, and they at that time cited ponding or stagnated water
5 by the railroad tracks. That was an issue of concern. This
6 was in April '09, months ahead of the observed condition
7 behind Carolina--behind House of Raeford Farms in September.

8 May 11th, 2009, a notice of violation was issued
9 by the Division of Water Quality that cited "'Illicit
10 discharges occur from the offal parking/staging area,'" and
11 "'The ditch adjacent to the offal truck staging area appeared
12 to have wastewater characteristics.'" That's one of the
13 statements I read earlier.

14 Q What is the definition of offal?

15 A Offal are the waste products from slaughtering
16 poultry that are not typically part of the food chain from
17 that industry. They're waste products.

18 Q Okay.

19 A May 27th, 2009, the letter from Carolina
20 By-Products to Rick Shiver that we've already looked at that
21 discussed "'The offal staging area and the adjacent ditch
22 mentioned in item 2 of the Inspection Summary soon will be
23 undergoing a major renovation.'"

24 June 16th, 2009, a letter from Eric West, which I
25 presented earlier, from the Natural Resources Conservation

1 Service to the North Carolina Division of Water Quality in
2 Wilmington. The report discussed issues associated with site
3 drainage and it further stated that "...the volume of
4 standing water has been improved by removal of beavers and
5 beaver dams obstructing flow of water."

6 Now, I don't know the precise date of when those
7 beavers and beaver dams were removed from that area that we
8 discussed earlier, but it would have sometime immediately--or
9 sometime prior to June 16th, 2009.

10 Q Okay. Keep going.

11 A June 26, 2009, there's a letter from David Frey of
12 Carolina By-Products to the North Carolina Division of Water
13 Quality in Raleigh. It reports the results of stormwater
14 monitoring conducted on June 9th, 2009 that revealed elevated
15 fecal coliform. There's an established continuous record of
16 stormwater issues at that facility.

17 And then there's no other available data that I've
18 seen between that June 26th, 2009 and September 24th, 2009
19 when sampling by the North Carolina Division of Water Quality
20 of the Carolina By-Products railroad track area had dissolved
21 oxygen at 1.01 milligrams per liter.

22 Q Did you do a similar summary of the Duplin Winery
23 timeline?

24 A I did.

25 Q Okay. Why don't you present that?

1 A I'll try to go through this quickly. A lot of
2 this is going to be redundant with what we did earlier, but I
3 think it establishes a nice chronology.

4 April 21st, 2009, months prior to the issue
5 identified in September of 2009, the North Carolina Division
6 of Water Quality compliance inspection report for the Duplin
7 Winery listed noncompliance status for stormwater, and the
8 dissolved oxygen in the stream was .5 milligrams per liter.
9 "'The ditch was full of black septic wastewater with putrid
10 odor'." We read that from their report earlier.

11 June 23rd, 2009, the Division of Water Quality
12 compliance inspection report listed noncompliant conditions
13 for stormwater. "'The inspector and supervisor walked to the
14 ditch in line with the overflow structure and witnessed a
15 discharge to the ditch.' Also stated was, 'the greatest
16 volumes were generated during the grape season,'" which is
17 August to November.

18 July 8th, 2009, the North Carolina Division of
19 Water Quality compliance inspection report just simply listed
20 stormwater as a question area. There weren't a lot of
21 details on that.

22 September 23rd, 2009, a North Carolina Division of
23 Water Quality compliance inspection report states that
24 "'...the ditch was full of wastewater again." Now, what's
25 pertinent to me in my review of those documents at that point

1 is there's no other inspection work that's happening between
2 this July event in 2009 and later in September, about two
3 weeks after the investigation of the conditions behind House
4 of Raeford Farms were involved. And at the time that they
5 did come and look there in September 23rd, 2009, they did see
6 wastewater in the ditch.

7 Again, on September 24th, the following day, the
8 Division of Water Quality collected some samples and did some
9 field monitoring. And a sample labeled as DW ditch at the
10 bend reportedly had dissolved oxygen at .35 milligrams per
11 liter, demonstrating low dissolved oxygen concentrations in
12 the upper headwater reaches of Cabin Branch near the source
13 of spillage.

14 Then we move to July 22nd, 2010. The North
15 Carolina Division of Water Quality conducted a compliance
16 inspection report and their facility was listed as non-
17 compliant. And they have a quote, "'A buried pipe with an
18 outlet to the ditch approximately 100 yards from the pump
19 house was noticed.'" There was a lot of attention made to
20 that pipe being a concern area.

21 September 15th, 2009, a North Carolina Division of
22 Water Quality compliance inspection report lists the facility
23 as noncompliant. "Pipe noticed during the 7/22/10 investiga-
24 tion was still uncapped. 'The water in the ditch had a
25 septic appearance.' 'The facility has yet to turn in an

1 application for permit coverage under NCG060 for the wine
2 facility on Yellow Cut Road.'" "

3 Q Let me clarify. That was 2010, not---

4 A (interposing) That was in 2010, September 15th,
5 2010, a year later.

6 And then October 15th, 2010, a notice of violation
7 was issued by the North Carolina Division of Water Quality to
8 Duplin Winery. The NOV cited conditions and observations
9 from the NCDWQ site visit on September 15th, 2010. "The NOV
10 stated that dissolved oxygen was measured at a concentration
11 of .6 milligrams per liter in the ditch north and west of the
12 winery."

13 Q All right. As a result of all of this material
14 and facts and these timelines, did you do an investigation of
15 the dissolved oxygen levels in Cabin Branch during the time
16 period September of 2009?

17 A Did I do an investigation of dissolved oxygen
18 levels?

19 Q Yeah, looked at the results.

20 A I looked at the results. I didn't do any direct
21 measurements myself.

22 Q In order to do that did you meet with Jay Baker of
23 Environmental Chemists?

24 A I had conversations with Jay Baker of
25 Environmental Chemists about the sampling that he conducted

1 in 2010 on behalf of House of Raeford Farms.

2 Q In order to---

3 A (interposing) There were several results.

4 Q Did you have to figure out where the locations of
5 the sampling were taken?

6 A He provided those locations to me.

7 Q And he provided those---

8 A (interposing) Yeah.

9 Q ---those locations to you, so you knew where the
10 samples were?

11 A That's correct.

12 Q Did that help you perform your analysis of---

13 A (interposing) It helped me better understand the
14 context of where that sample information was taken and be
15 able to look at it in the context of the various aspects of
16 the Cabin Branch drainage system.

17 Q If you can, show me where those testing samples
18 were taken.

19 A Okay. What I would like to do is, if I can, to
20 show a contrast of the--a summary of some 2009 data of
21 dissolved oxygen---

22 Q (interposing) Yeah, start with 2009.

23 A ---and then compare it with the 2010, if you'll---

24 Q (interposing) Start with 2009. I guess that data
25 was provided by the State.

1 A That's correct. I just made a summary. This map
2 simply shows a compilation of the lowest dissolved oxygen
3 values reported by the state for any sampling location that
4 was identified. So it's the minimum dissolved oxygen.

5 Now, dissolved oxygen can vary somewhat from day
6 to day. We see it in the records of repeated readings taken
7 at some of the sites. Dissolved oxygen can change with
8 various aspects of flow and interaction with wind turning
9 over the water and that type of thing.

10 So this is a summary map that simply presents
11 those values of the lowest reported dissolved oxygen from the
12 various locations that had been monitored in 2009.

13 Q What did that show?

14 A It shows at the--we'll start at the headwaters
15 that we've been looking at. At the headwaters of the Cabin
16 Branch drainage area near Carolina By-Products and the Duplin
17 Winery, we have two values. 1.01 milligrams per liter
18 dissolved oxygen and .35 are the lowest that I found records
19 of for that area showing--contribution of wastewater to the
20 headwaters of that location in September of 2009 showed
21 depleted oxygen conditions.

22 Then as you work your way downstream, you have
23 depleted oxygen conditions at the Highway 117 bridge on Cabin
24 Branch and a little higher on the separate tributary, unnamed
25 tributary, shown here (indicating) feeding into US 117

1 bridge, still below the 4 parts per million standard that is
2 looked at.

3 Working further down, you don't have any other
4 data of monitoring during this time period until you get to
5 the Brooks Quinn Bridge right here (indicating). And I'll
6 clear that out so you can see the number.

7 Q And that's---

8 A (interposing) 1.65 milligrams per liter.

9 Q But upstream of House of Raeford?

10 A Upstream of House of Raeford, that's correct,
11 showing substantially depleted oxygen conditions in water
12 coming from upstream areas to the approach of the House of
13 Raeford property. Adjacent to the lagoons, the lowest value
14 reported September of 2009 was .35 milligrams per liter.

15 Further downstream at the Sheffield bridge is .14. And so
16 that's the end of the Cabin Branch portion of that drainage.

17 I want to look now at the separate drainage system
18 that feeds in and joins Cabin Branch just upstream from the
19 Sheffield bridge, and that is Beaverdam Branch. So if you
20 come off of Johnson Lake here in the west (indicating) and
21 you have water flowing through this stretch under the
22 railroad tracks back to Highway 117, there's a monitoring
23 event that occurred there that shows a .6 milligram per liter
24 value reported from that drainage location. Well, this is
25 substantially upstream from the area where the solids were

1 observed in the creek.

2 A little further down and just upstream of this
3 unnamed tributary was a sample collected adjacent to the
4 Parker Bark facility at that location, 1.3 milligrams, so
5 they're also showing reduced dissolved oxygen conditions. At
6 the very headwaters of that unnamed tributary, way up here
7 (indicating) to the north on 117, was a 2.7, also below the 4
8 value.

9 Then we have another unnamed tributary coming off
10 of Johnson Parker Road feeding in from the north that comes
11 into Beaverdam Branch downstream of Sheffield. In that
12 stream they measured at Johnson Parker Road .3 milligrams per
13 liter. This is a totally separate drainage system. It's in
14 an entirely separate creek system. It's not even---

15 The Court: (interposing) I'm going to
16 have to ask you-all if you're going to discuss something to
17 go outside to do that, please?

18 Mr. Shriver: Yes, Your Honor.

19 The Court: Thank you.

20 A It's an entirely separate drainage basis or
21 sub-basin to Beaverdam Branch feeding in and isn't part of
22 the downstream flow section from the area that was observed.
23 It also shows oxygen depletion.

24 Then we look at Maxwell Creek, which is another
25 completely separate drainage basin that they monitored at

1 the--I can't even see the name of that road. It's Brooks
2 Quinn Road. It looks like it changes names to the north.
3 This location at the Brooks Quinn Road bridge right there is
4 .1 milligrams per liter, completely separate drainage that
5 doesn't meet up with Beaverdam Branch until east of I-40.

6 And finally there was one that I skipped I believe
7 at the Brooks Quinn bridge where .07 milligrams per liter was
8 found on Beaverdam Branch at that location.

9 Q Is that area downstream from House of Raeford?

10 A Downstream. There was one other here (indicating)
11 way out on Highway 11, North Carolina Highway 11, .3, out on
12 the far eastern margin of the page-- .3 milligrams per liter.

13 Q Is that on Beaverdam Branch too?

14 A It is on Beaverdam Branch.

15 Q That's on the other side of Interstate 40, though?

16 A That's correct. That's on Highway North Carolina
17 11.

18 Q To make sure we---

19 A (interposing) Let me see if I can't postpone
20 that.

21 (Pause.)

22 I apologize. I don't know what made it do that.

23 Q Explain again--this data is minimum DO data
24 that---

25 A (interposing) It's the lowest reported dissolved

1 oxygen throughout this drainage basin and the values that
2 were collected by the state.

3 Q For the month of September?

4 A Correct.

5 Q Of 2010--or '9?

6 A There's another one that's not included as a part
7 of this that I need to turn on on this slide. Is that---

8 Q (interposing) Okay.

9 A So it is another dissolved oxygen sample that was
10 September 20--I can't read my own number there--September
11 16th, 2010. That is not right. I'm sorry. It has advanced
12 a slide. I didn't mean for it to do that. I apologize.

13 (Pause.)

14 I'm sorry. I got confused. I think we're both
15 right.

16 Q I'm with you.

17 A I apologize for that.

18 Q Now, what does this slide show?

19 A This is that same slide that we were discussing.
20 This is the September 2009 slide. I'm sorry I got confused
21 and advanced it by mistake. What this tells me is that
22 throughout this drainage basin, from its headwaters to the
23 downstream reaches, there was a problem with dissolved oxygen
24 throughout the region that can't be assigned necessarily
25 solely to the floating material in the creek behind the House

1 of Raeford Farms secondary lagoon.

2 This is a systemic problem. We see this a lot in
3 coastal plain streams with swamp water environment,
4 especially in the summertime. Oxygen gets depleted.
5 Nutrients are high. Temperatures are high. Algal growth is
6 at a maximum. Bacterial activity is accelerated because of
7 the higher temperature consuming the nutrients. And you see
8 depleted oxygen throughout these reaches.

9 Some of it is related to non-point source runoff
10 of nutrients. Some of it is related to point sources like
11 what's been identified by the state at Duplin Winery and
12 Carolina By-Products.

13 Oh. I did not mean to do that. I apologize.

14 (Pause.)

15 Okay.

16 Q Are you ready?

17 A The technology is sabotaging me today. I apolo-
18 gize.

19 Q Again, the value of paper as opposed to these
20 other things. Are you ready to proceed?

21 A I am ready to proceed to a comparison with
22 September 2010 to help prove my point. These are the
23 locations of samples reported to me--not reported to me, but
24 the locations told to me or given to me of the samples
25 collected by Environmental Chemists in 2010 as a part of the

1 monitoring that was requested by House of Raeford Farms for
2 them to perform.

3 Q Do those locations line up fairly comparably with
4 the ones done the previous year?

5 A Some of them are similar to the locations where
6 the state sampled, like the Highway 117 bridge is quite
7 similar here (indicating) in the upstream section of Cabin
8 Branch. And these locations near Sheffield bridge and close
9 to the House of Raeford Farms lagoon area are similar. There
10 was at least one other shown here (indicating) in a ditch by
11 the guardhouse upstream of the facility that was also
12 collected a couple of times.

13 Q Are these also minimum levels?

14 A These are the minimum levels from September of
15 2010 monitoring that were included from the lab reports that
16 were given to me.

17 Q In the Cabin Branch drainage---

18 A (interposing) In the Cabin Branch drainage, yes.

19 Q How do they match up with the ones for the
20 previous year?

21 A Well, what they show is that a year later, in
22 September of 2010, we still see low dissolved oxygen
23 conditions in upstream areas and in areas proximal to the
24 previous investigation near the House of Raeford Farms
25 lagoon.

1 Q Why don't you show some of those totals there---

2 A Okay.

3 Q ---that would be relevant to House of Raeford?

4 A Sure, yes. So the minimum value reported from
5 this set of data in 2010 was .9 milligrams per liter at the
6 Highway 117 bridge on Cabin Branch, .9 milligrams per liter.
7 I did it again. I'm so sorry.

8 (Pause.)

9 There we go. At the ditch at the guard shack away
10 from--upstream from the lagoon area on House of Raeford Farms
11 property is a 1.6, which you see right there (indicating).
12 Adjacent to the House of Raeford Farms secondary lagoon are
13 two minimum values. One is 1.94 milligrams per liter. The
14 next one downstream is .92 milligrams per liter. And then at
15 the Sheffield bridge on Cabin Branch--well, it's actually
16 Beaverdam Branch at that point where the two join together--
17 is 1.24 milligrams per liter.

18 Q And this is a year after the investigation?

19 A Correct. One of the things that I found very
20 interesting is that the lowest value that they detected was
21 actually upstream of the House of Raeford Farms facility at
22 Highway 117. And to me that would be consistent with the
23 contribution of impaired water quality and reducing of dis-
24 solved oxygen from the two facilities in the headwaters,
25 Carolina By-Products and Duplin Winery.

1 There's also another 2010 value that I'd like to
2 turn on on this slide, if I could---

3 Q (interposing) Okay.

4 A ---just to make an additional point. We didn't
5 have any data from September of 2010 proximal to the Duplin
6 Winery or the Carolina By-Products facility. But there is an
7 inspection that was done September 16th, 2010 by the NCDWQ
8 that I've been able to add in as a supplement to the
9 Environmental Chemists data of .6 milligrams per liter, an
10 even lower value than what we see in the downstream areas.

11 Q That was picked up on the timeline that you showed
12 us---

13 A (interposing) That's correct.

14 Q ---a few minutes ago?

15 A That's correct.

16 Q Anything else in relation to the year following
17 the investigation at the House of Raeford?

18 A I think it just demonstrates that this drainage
19 system of Cabin Branch in summertime during low flow
20 conditions exhibits low dissolved oxygen, partly from a
21 result of the stagnated flows, but also as a contribution of
22 point source and non-point source nutrients entering the
23 system and wastewater from these upstream sources that have
24 been identified by the state.

25 Q Okay. Did you do any examination of the fecal

1 coliform levels?

2 A I did. There were some fecal coliform data that I
3 thought were pertinent to look at bacterial population, fecal
4 coliform bacterial populations associated with this study.

5 So this first one is a maximum value of fecal
6 coliform reported from each location that we have data from
7 in September of 2009. It's a similar map to the September
8 2009 dissolved oxygen. It was looking at the highest
9 reported values from the various testing events that went on
10 during the September 2009 investigation.

11 And we see some--starting at the headwaters of the
12 stream, we see some elevated fecal coliform, 3300 at the
13 US 117 bridge, upstream from the House of Raeford Farms,
14 31,000 at Brooks Quinn Road right there (indicating).

15 Then there's a lower value of 1700 immediately
16 upstream of the area where the accumulated material was, the
17 so-called sludge, 1728 coliform units. And then in the midst
18 of the floating material, they have a value greater than
19 60,000 coliform units.

20 Then if we look at data from Beaverdam Branch,
21 there was a sample collected upstream of the Sheffield bridge
22 on Beaverdam Branch upstream of the accumulated, floating
23 so-called sludge. We have 726 with an est., which I--I'm
24 sorry, 728 with an est., which I assume means estimated value
25 by the lab.

1 This unnamed tributary that crosses Highway 117 in
2 the far northern area of this map has 1364 est. value of
3 fecal coliform. At the Johnson Parker Bridge with that
4 unnamed tributary that feeds in from a totally separate
5 subdrainage area to Beaverdam Bridge, 1455 coliform units
6 estimated; at the Brooks Quinn Bridge on Beaverdam Branch,
7 27,000 downstream of the House of Raeford Farms facility; on
8 Maxwell Creek at Brooks Quinn Road, 1728. That's another
9 separate drainage system that doesn't feed in until down-
10 stream of Interstate 40 to join up with Beaverdam Branch,
11 unrelated to the Cabin Branch condition.

12 Q And what is the legal standard for fecal coliform
13 in that area?

14 A I don't know about a standard specifically per se,
15 but having elevated fecal coliform indicates the presence of
16 active bacteria that are consuming available organics and are
17 affecting the quality of the water. Some of those fecal
18 coliform organisms can be disease carrying, and so the goal
19 would--the goal would be to not have them present.

20 Q So the higher the level, the---

21 A The higher the level---

22 Q ---worse it is?

23 A ---the higher the probability that you could have
24 some disease causing pathogen associated with the bacterial
25 populations.

1 Q Is the presence of fecal coliform bacteria
2 indicative of livestock and (inaudible)---

3 A (interposing) Oftentimes yes, oftentimes.

4 The Reporter: I'm sorry; and what--livestock
5 and what?

6 Q Livestock operations and animal agriculture.

7 A Oftentimes yes.

8 The Reporter: Please let him finish his
9 question.

10 The Witness: I'm sorry. Sometimes I get in
11 a hurry.

12 A Oftentimes yes.

13 Q Have you traveled around in the--this drainage
14 basin?

15 A Uh-huh.

16 Q Have you noticed the presence of animal
17 agriculture and---

18 A (interposing) There are numerous growing--farming
19 operations. There are poultry houses. There are hog
20 operations throughout the drainage--the Cabin Branch and
21 Beaverdam Branch drainage basin. There are a variety of
22 those type of farming operations.

23 There's also a lot of agricultural cropland that
24 involves the addition of nutrients. Sometimes those
25 nutrients might include poultry litter as a fertilizer and

1 those type of things, applying manure to help grow crops.

2 All these things add to the available supply of
3 non-point source pollutants after a storm event that can
4 enter the stream system and contribute to the nutrient load
5 of the stream and also can contribute to the quantity of
6 fecal coliform bacteria that you see in the stream flow.

7 Q And all those areas are present in areas that
8 drain into Cabin Creek?

9 A Correct. You asked me about animals. Do you want
10 me to continue?

11 Q Yes. Go ahead. To finish my thought about the
12 contribution--you talk about animals contributing to fecal
13 coliform. Another potential source is humans and human
14 waste. Sewage is another common contributor. I just want to
15 make sure that I didn't leave it just stuck with animals.

16 Q Advance, if you would--did you discover any fecal
17 coliform measurements taken in June of 2009 that were
18 actually done at the request of---

19 A (interposing) Yes.

20 Q ---the state?

21 A Yes. This is not actually in September of 2009.
22 We don't have any fecal coliform monitoring near the Carolina
23 By-Products facility in 2009, so I had to back up to the next
24 closest event, which was June 9th, 2009. There was a
25 monitoring event that showed 49,000 coliform units at the

1 Carolina By-Products facility. It was a function of their
2 stormwater runoff problems that had been obviously noted.

3 Q In June of 2009?

4 A June of 2009, so---

5 Q Okay. Is that all on that slide, then?

6 A I believe that's everything on that summary slide
7 of September 2009.

8 Q All right. And did you do the very same kind of
9 analysis for 2010?

10 A For fecal coliform I did. I plotted up an
11 evaluation of the available fecal coliform results from the
12 testing performed by Environmental Chemists in September 2009
13 at those same locations, so their positions are consistent.

14 And the curious thing about that set of data is
15 that at every location that they sampled for this one event,
16 they had greater than 60,000, which was the top end of their
17 quantitation limit for fecal coliform results at each of
18 those---

19 Q (interposing) Where were those locations? Point
20 out those locations.

21 A Okay. One is here (indicating) at Highway 117
22 where Cabin Branch crosses under the Highway 117 bridge. So
23 we have above their quantitation limit for that. At the
24 guard shack ditch upstream of the House of Raeford Farms
25 lagoon area, it had greater than 60,000; two locations in

1 Cabin Branch adjacent to the--just upstream of and adjacent
2 to the secondary lagoon, greater than 60,000; and near the
3 Sheffield bridge, greater than 60,000.

4 The other thing I want to mention that I didn't
5 mention before is there was another sample collected for
6 dissolved oxygen and for fecal coliform by Environmental
7 Chemists that isn't shown on my maps. And it is an extreme
8 location far downstream on the Cape Fear River. And the day
9 that this work was done, they also at the Cape Fear River had
10 greater than 60,000 fecal coliform result.

11 That seemed curious to me to have such high
12 levels, but it is not unusual to see them--to see those kind
13 of results shortly after a significant storm event where
14 nutrient runoff and non-point source pollutants come into the
15 stream systems and can often lead to very high levels of
16 fecal coliform results.

17 I believe--I'm sorry. I was trying to see if
18 there was another---

19 Q (interposing) Anything else on that slide?

20 A That's it for that slide, yes.

21 Q Okay. Go on to your next, then.

22 (Witness complies.)

23 A I have some details of my site inspection that
24 shows some photographic record of the visit that I made on
25 April 13th, 2011 that helped to illustrate my evaluation of

1 the conditions in the stream.

2 So this is a simple Google Earth image that's been
3 zoomed in to show the secondary lagoon here (indicating),
4 approximately. And this is Cabin Branch paralleling the
5 secondary lagoon. It comes up to this first push pin that
6 says "Sharp turn in stream." And that's where I took
7 photographs of an almost right turn in the stream back to the
8 east, immediately downstream of the secondary lagoon.

9 And then I have another one--the coordinates
10 that--I took these with a GPS. I put this push pin a little
11 bit off the stream, but that position there for photos 2 and
12 3 is in--Cabin Branch stream is right parallel through here
13 (indicating) where I've indicated beside of this large quarry
14 area.

15 And then I have another set of photos, photos 4
16 and 5, right near the mouth--and 6 right near the mouth of
17 Cabin Branch where it empties into the abandoned quarry pond
18 on the Parker Bark facility. And then I have another photo
19 immediately upstream.

20 This is photo 7 that I stationed there. I
21 collected some photos immediately upstream of Sheffield
22 bridge. And that shows the conditions that existed just
23 upstream of the Sheffield bridge. And then I have--my final
24 location here (indicating) was that log jam that I described
25 earlier where we couldn't go beyond with the boat. And I

1 have some photos or a photo of that.

2 So these next slides, we'll go through those
3 photos to illustrate. And I will talk through a description
4 of what is shown in each of those.

5 Q Go ahead.

6 A So here's photo number 1 from my visit on
7 April 13th, 2011. This is a johnboat that we launched. You
8 can see Clay Howard was with me on this trip. This is the
9 sharp turn in the stream immediately downstream of the
10 secondary lagoon.

11 And the thing that's notable about this is the
12 trapping of floating materials, specifically aquatic
13 vegetation like duckweed, at that location. The stagnant
14 flows in this location allow--or lead to accumulation of
15 floating material.

16 And we see it today. This is the same position
17 where a significant portion of the accumulated so-called
18 sludge was in 2009. The same mechanisms that trap floating
19 material still do the same type of trapping today.

20 Q How far downstream is this picture taken from the
21 area---

22 A (interposing) This is a pretty short distance, a
23 matter of--going back to this slide, it's probably I would
24 say 150, 200 feet downstream from the secondary lagoon.

25 Moving further down this channel--and you can see

1 this duckweed extends quite a ways back through this bend.
2 There's a lot of trapping of this because the flows are so
3 stagnated in this stream. And this stagnant flow, once
4 again, is associated with backing up into--the discharge into
5 that large, wide lake.

6 Here's another feature that I noticed along that
7 same stretch of the creek. There's numerous fallen logs.
8 They tend to accumulate some level of duckweed and floating
9 debris along the path. So there's photo number 2. Photo
10 number 3 is another view of that same location showing how we
11 had to navigate around the fallen tree.

12 Photo number 4 is another fallen tree. Notice the
13 trapping of the duckweed on the upstream side, which is to
14 the left right in here (indicating). The majority of it is
15 being trapped on the upstream side of that fallen tree that's
16 in the channel of Cabin Branch.

17 Q Why is that so significant?

18 A Well, that's a proxy. Any floating material is a
19 proxy for the floating, so-called sludge accumulation, this
20 frothy material that's been described that was trapped in
21 this area in September 2009. This floating aquatic
22 vegetation behaves in a similar manner, I would believe, to
23 that. Here's a close-up view of that accumulated duckweed in
24 that area just as an illustration.

25 Here's another fallen tree right close to the

1 opening of Cabin Branch into the quarry, the abandoned quarry
2 pond. And there is this accumulation of material, which you
3 can see here, that's trapped along the margin of the creek
4 where this fallen tree occurs. There wasn't as much duckweed
5 in that. There was a lot of other floating material, and I'm
6 not quite sure how to describe it other than perhaps--it
7 seemed to be of an organic nature.

8 This is going further downstream after we've
9 exited the quarry pond and we're moving and approaching
10 Sheffield bridge, okay? So in the background is the
11 Sheffield bridge, Sheffield Road bridge. So we're still in
12 Cabin Branch. We haven't quite joined up with Beaverdam
13 Branch. We've just exited the quarry pond. There's a large
14 fallen tree, which you'll see here (indicating), that has
15 been cut out and the remnants of it are laying in the water
16 and create an obstruction to flow and to navigability.

17 Now, I've passed under Sheffield bridge. We've
18 already--I do want to go back to this slide because--
19 Beaverdam Branch comes in right over here (indicating) where
20 I've indicated. This is on the left of the slide. The
21 Beaverdam Branch Stream joins up just upstream of that
22 Sheffield bridge.

23 This next picture shows the log jam downstream of
24 Sheffield bridge on Beaverdam Branch, okay, so this is after
25 Cabin Branch and Beaverdam Branch have joined together. And

1 this is a substantial obstruction that was--appeared to be in
2 place in 2009. There's a similar trapping mechanism.

3 Notice the significant amount of aquatic vegeta-
4 tion in this area, duckweed. There's trash. There are a lot
5 of types of debris being trapped. The flows on this stream
6 are quite slow and they're not able to under this kind of low
7 flow condition mobilize this floating material and flush it
8 out. It takes a storm event of some sort to really change
9 that condition and move that material.

10 Q Now, you saw pictures of the same area that were
11 taken---

12 A (interposing) I did.

13 Q ---in 2009.

14 A And there was--this area was trapping a lot of
15 this similar duckweed as well as this material that they
16 described as sludge, that same floating material accumulated
17 in this area. Do you want me to talk about other areas that
18 I looked at?

19 Q Sure. Let's go to the other---

20 A (interposing) Okay. So here's--as a part of this
21 same April 13th, 2011 visit to the area, I was able to gain
22 access to the upper--upstream reaches of Cabin Branch in the
23 vicinity of Magnolia Elementary School.

24 Q And why did you do that?

25 A Well, I had looked on the aerial photographs of

1 the area and recognized a suspicious structure that was like
2 a wastewater handling facility on the Magnolia School
3 property. And I wanted to be diligent and evaluate whether
4 or not that could be a contributor to stream degradation as a
5 point source. So we were able to gain permission to enter
6 the property and inspect and take some photos and access the
7 creek behind that facility.

8 Q And these four pinpoints are where you took photo-
9 graphs?

10 A Where I took a series of photos; that's correct.
11 So we'll start with photo number 9. Photo number 9 is an
12 overview of that wastewater handling facility or former
13 wastewater disposal facility. I don't think it's active.

14 There's a fenced area with a gate that is in
15 disrepair. There are overgrown trees growing throughout this
16 facility. It looks to me as though this probably were the
17 primary wastewater handling facility when the school was
18 built, but over time they found an alternative way to get rid
19 of their sewage and they've left it laying. It doesn't seem
20 to be active to me.

21 Q How far upstream is this from House of Raeford?

22 A This is, oh, approximately maybe a mile or less
23 upstream. This is just a short distance upstream from the
24 Brooks Quinn Bridge, a little ways up there.

25 You'll see in this photo a building that was

1 probably part of the sewer processing operations. There's an
2 elevated mounded area that's a sand bed. And I've got other
3 photos of this that I've taken, but I'm not presenting them
4 right now. And this involved an elevated sand bed that would
5 have taken wastewater through infiltration, I believe, as a
6 means of disposing of their effluent from their sewage from
7 the facility.

8 Two things to notice are these standpipes.
9 There's one here (indicating) just in the foreground of the
10 building, and one off to the left of that, as you'll see
11 there (indicating). These are cast iron pipes that stick up
12 aboveground and they have a grate on them, much like a floor
13 drain grate. So they're covered to prevent, I assume,
14 animals and debris from going down in them.

15 I looked at each of those and ascertained that
16 they have--you can hear water flowing and you can smell a
17 sewage odor. I'm assuming that they are connected to the
18 sanitary sewer system that serves the school facility. Both
19 of those you could smell the sewer odor. It smelled like,
20 you know, a sanitary sewer, and you could hear the water
21 flowing through the piping that they were connected to.

22 Q So it's an active---

23 A (interposing) It seems to be connected to an
24 active sanitation system. Off to the left of that close-in
25 standpipe is a structure. There's a series of structures

1 over here to the left of this view (indicating).

2 One is-- right at this location to the right of
3 the area I've circled is a separate manhole cover that is
4 marked as a sanitary sewer manhole on the top. It sticks up
5 above grade a small distance. And then there's a concrete
6 platform area with two manholes, and I'm going to show you
7 some details of that on the next slide.

8 So here it is. This is the single sanitary sewer
9 manhole, and then there's this concrete pad with two manholes
10 on it. And I believe all these are associated with the
11 sanitary sewer system serving the Magnolia Elementary School.

12 That wouldn't be a remarkable thing to just have
13 sanitary sewer manholes except for what I observed about this
14 one in the foreground. And the thing that I observed about
15 that one is that there's a concrete collar that would seal
16 around the upper parts of that, if this were a fully
17 maintained, properly constructed and operated sanitary sewer
18 system.

19 Instead there's a breach and a breakaway of the
20 concrete collar at this location right there (indicating),
21 where the concrete is completely absent. And the sewage down
22 in the manhole is exposed to the atmosphere. There's no
23 sealing of the system by that manhole cover. I have another
24 photo of it that's a close-up to show you the magnitude of
25 that.

1 I was able to look down in and estimate that the
2 depth to the fluids in that sanitary sewer manhole were
3 probably within 3 feet below land surface, but I did not
4 enter into it and make any kind of direct measurements. But
5 my professional guess is that it's about 3 feet or so below
6 land surface. You could smell sewage odor coming off it and
7 you could hear fluids flowing through that piping system
8 associated with that. In my opinion it's an active section
9 of the sewer system. Do you want me to---

10 Q (interposing) All right.

11 A ---continue?

12 Q Go on to the next one.

13 A Okay. The next slide is coming off of the sand
14 bed, an elevated infiltration field that seems to be out of
15 service. There was a mound leading away from that elevated
16 sand bed that I followed into the swamp.

17 It was a linear mound that stretched from that
18 fenced-off area back to the north going into the swamp margin
19 of Cabin Branch. And at the end of that was this structure,
20 so I traced that, did some detective work, I guess. And
21 there's a concrete structure here (indicating), and it
22 indicates that--there's a pipe right at this position
23 (indicating) that I believe connects back up to the old,
24 probably out of service sewer handling facility on the
25 property.

1 The next picture shows a detail of the pipe in
2 that structure. It is partly submerged in swamp water from
3 Cabin Branch and the adjacent waters that feed into Cabin
4 Branch, and it has a flapper valve. A flapper valve simply
5 is--only allows flow to come out in one direction, okay, so
6 if there's pressure behind that valve, it will simply open up
7 and allow fluid to flow out. But if there's pressure coming
8 the other way, it will tend to close. The flaps close.

9 You can see that on the sides over here in this
10 image it's not tight. It's not sealed. It's open partly.
11 I'm not necessarily saying that there is any fluid that's
12 being exchanged on this pipe. I'm just saying this was a
13 structure that if it were active, it would create an oppor-
14 tunity for contribution of wastewater into the system.

15 I don't know about the operational status of it
16 and when it was decommissioned and whether or not that pipe
17 is permanently disconnected from the active sewer system
18 that's back up at the other part or is there still some
19 connection. I really don't know. I just documented the
20 facts of what I observed.

21 The next photo from this area is where I got to
22 the channel of Cabin Branch, a little bit downstream from
23 that pipe. At this location I found this nice example of a
24 beaver dam. And we've already heard about--testimony of--or
25 records of removal of beaver dams in the headwater reaches of

1 Cabin Branch, and I think probably the name Beaverdam Branch
2 is because beavers are quite active in this region. Here's a
3 great example of a beaver dam at that location.

4 I put this in for an illustration to show the
5 dynamics of the type of impact that a beaver dam has on flow
6 in a stream. You can see on this edge is cascading water
7 coming off of the beaver dam flowing back into this narrow
8 channel that is Cabin Branch downstream.

9 If you look in the areas upstream of the beaver
10 dam, you have this impounded swamp that extends way back up
11 in this region (indicating) and extends way back to the left
12 of this page. So this dam has a height, I would estimate, of
13 approximately 4 feet elevation change. So the water up here
14 (indicating) is on the margin of 4 feet elevation higher than
15 the water down here (indicating). That's my eyeball guess.
16 It's not meant to be definitive, but it shows a point.

17 So the impact of flow on the streams by structures
18 like this is that areas where you have blockages in the
19 stream cause drop in stream velocity and impound water and
20 create flooded swamp areas. In areas where you don't have
21 obstructions, you can have--like right through here
22 (indicating), you have an ordinarily defined channel and your
23 velocity increases. Your velocity picks back up and you have
24 a more even flow.

25 Q And this area is upstream from---

1 A (interposing) This is upstream from House of
2 Raeford Farms.

3 Q ---House of Raeford?

4 A Uh-huh. The next set of photos that I collected
5 on that day, April 13th, 2011, was a series of photos from
6 the area closest to the Carolina By-Products facility and
7 Duplin Winery. These were photos that I took from the
8 railroad right-of-way area. I certainly didn't want to enter
9 upon these properties, but I just drove down the public roads
10 and then walked up the railroad tracks.

11 So the first set of photos, there's--photos 17
12 through 20 will be a series of photos of the conditions in
13 the ditch right near the entryway beside the railroad tracks
14 of the Carolina By-Products facility. And then I'll have--
15 photo number 15 will be on the railroad tracks into the
16 margin of the swamp, approaching the main channel portion of
17 the headwaters of Cabin Branch. And then where the water
18 crosses underneath of Cabin Branch--I'm sorry, where it
19 crosses underneath of the railroad tracks, I have a photo
20 there.

21 So here's photo 15. Photo 15 shows a view of the
22 ditch beside the railroad tracks near Carolina By-Products.
23 I put this in just to show the nature of the flooded ditch
24 conditions that have been referenced in prior documentations
25 from compliance inspection. There's a lot of rotting

1 vegetation. There's old, dead, decaying trees. There's a
2 lot of film and algal mats and things of that nature that you
3 see. This is classic swamp water type conditions, probably
4 low dissolved oxygen, that type of thing.

5 Q What is the material, if you can tell, there in
6 the middle of the stream?

7 A This right here (indicating)?

8 Q No, above that, that---

9 A (interposing) This up in this region
10 (indicating)?

11 Q That part.

12 A It appeared to me to be some sort of floating
13 organic material similar to a algal mat, algae growth, maybe
14 some aquatic vegetation mixed in there as well. I didn't get
15 into the stream and really try to characterize it--or into
16 the ditch.

17 This next photo is at the railroad bridge looking
18 to the east. This is looking downstream on Cabin Branch.
19 Now, this is the area that was--sometime before the middle of
20 June, I believe, 2009, beavers had been removed from this
21 area to facilitate better drainage. So beavers and beaver
22 dams and other obstructions would have been removed to help
23 facilitate drainage.

24 There's a log jam right here (indicating) where
25 the channel tries--the center of the flow of Cabin Branch,

1 where it's been blocked up with a lot of debris and logs.
2 I'm no expert on beavers, but it looked to me like it could
3 be related to beavers. Perhaps they're reestablishing them-
4 selves by this point in time when I visited and are creating
5 new impounded conditions.

6 I would say the impounded swampiness of this area
7 suggests to me that something is blocking flow that perhaps
8 wouldn't have been the case after beaver dams and beavers
9 were removed from this area. You'll see a lot of aquatic
10 vegetation in this headwater reach of the stream.

11 This next series of slides starting with photo 17
12 is some close-up views of the ditch adjacent to the railroad
13 tracks right beside of Carolina By-Products' fence line. You
14 can see Carolina By-Products brings in tanker cars for some
15 of their process. You'll also see in some other photos where
16 they bring in trucks, tanker trucks.

17 There are discarded railroad ties in the ditch at
18 this location that are trapping--they're acting as an
19 obstruction somewhat to drainage of these ditches. There's
20 plenty of water standing in the ditch.

21 There's aquatic vegetation here along the margins,
22 but more importantly you see this floating material here
23 (indicating) that looks an awful lot like a sludge-like
24 material. This seems to have wastewater characteristics to
25 me similar to what you would expect from stormwater runoff

1 and the things that have been cited as problem areas for the
2 Carolina By-Products facility.

3 This next slide shows a close-up view of that
4 floating material that has some sludge-like characteristics.
5 I would say--I'm no expert and I'm not a biologist, so I
6 can't say the full characterization of that. I didn't do any
7 testing of it. But it does have some similarities to what
8 accumulated downstream.

9 And then here's one more view of where the truck
10 facilities are, where they bring in trucks and have staging
11 areas. These are some tanks associated with their rendering
12 process, I believe. And then right about this location
13 (indicating) to the right of those tanks is where the lagoons
14 are that you can see on the aerial photograph. I don't have
15 any good views of those lagoons because they're not
16 accessible from outside the fence line.

17 You can see where stormwater runoff has created a
18 little erosional rivulet onto the side of the bank leading
19 into this area closest to where we had this accumulated algal
20 growth and floating organic material.

21 Q Did that material appear to come by stormwater
22 drainage from the Carolina By-Products property?

23 A I would say so.

24 Q What material is being brought in those trucks?
25 Do you know?

1 A I don't know details about their operation. I
2 just know that they accept--according to Clay's testimony and
3 discussing it with Joe Teachey that they take the by-products
4 from the DAF, diffused air flotation system, at House of
5 Raeford Farms. They put it into trucks and they carry it to
6 this facility for processing.

7 And they also, I believe--Clay Howard mentioned
8 that they take other entrails and other solids directly from
9 the production line, the waste products, the offal, and truck
10 it to this facility as well.

11 Q Go on to the next slide, then.

12 A I think that those are the--those are the photos
13 that I had. This next slide is simply to present some
14 information from records of Joe Teachey's documentation of
15 rainfall monitoring of their wastewater spray field.

16 And part of what I wanted to do is in the context
17 of this entire drainage system get a better understanding
18 about the nature of the weather patterns and precipitation
19 feeding into this drainage system in the summer of 2009
20 leading up to the discovery of a problem in Cabin Branch
21 behind House of Raeford Farms. My understanding is that
22 daily monitoring occurs by Joe Teachey---

23 Q (interposing) Of the company?

24 A Of the company, thank you--of rainfall gauge
25 readings at their spray field. And so this is simply a

1 plot--and I don't know why this blue thing is coming up. I'm
2 not doing it.

3 (Pause.)

4 The Witness: Oh, from them? Can we have
5 them clear whatever they're touching? It's affecting the
6 screen.

7 The Court: Whenever you mark the screen,
8 you have the ability to mark it from your---

9 The Witness: (interposing) Could you please
10 hit the clear button on yours?

11 The Court: Whatever you touch you're---

12 The Witness: (interposing) There's a clear
13 button--touch the clear--it says "clear" in the left-hand
14 bottom corner.

15 (Pause.)

16 The Witness: It's still not clearing. Try
17 the left-hand bottom corner, the screen--you touch the screen
18 in the left-hand bottom corner.

19 Ms. LeVeaux: Oh, touch the screen right here
20 (indicating)

21 The Witness: In the left-hand bottom corner.
22 Thank you, thank you. I was wondering is technology
23 sabotaging us again.

24 A You'll see that throughout the period of July up
25 until early August there was some small rainfall events, but

1 it had been a dry period. The records that I reviewed of the
2 weather conditions throughout this region of the summertime
3 indicated from the North Carolina Division of Water Resources
4 web site that Duplin County was experiencing abnormally dry,
5 minimal drought conditions. It wasn't a severe drought, but
6 it was under early stage drought conditions.

7 Throughout most of July, there's really--through-
8 out the month of July, there's really not much precipitation
9 happening to add flow to Cabin Branch. But then when we
10 start to enter into August, we get two really significant
11 precipitation events. August--on or around August the 12th,
12 there's a 2½ inch rainfall event, which at that time was the
13 biggest one of that time period, and then a 3 inch rainfall
14 event on August 31st, 2009.

15 Now, I want to put that rainfall event, that 3
16 inch rainfall event, in context. I think I testified earlier
17 that the size of the Cabin Branch drainage area is approxi-
18 mately 5.6 square miles. Now, if you have a square mile of
19 area and you put an inch of rain on top of it, that equates
20 to 17 million gallons of water approximately. I've rounded
21 it. Okay?

22 If you put 3 inches of rainfall on the entire
23 Cabin Branch drainage area, which is 5.6 approximately square
24 mile area, you get a total precipitation of approximately 295
25 million gallons of water that hits the ground within the

1 footprint of the Cabin Branch drainage.

2 Now, what happens to that 295-plus million gallons
3 of water that enters the drainage basin? Well, some of it
4 goes back in the atmosphere from plant uptake and evapo-
5 transpiration. Some of it will soak in the ground based on
6 the type of soils you have, the height of the water table,
7 and the infiltration capabilities of the subsurface. That's
8 usually a pretty small amount of infiltration to recharge the
9 groundwater system.

10 But when you have a precipitation event that
11 large, a large portion of that occurs as surface runoff, runs
12 to ditches that then drain quickly into other ditches and
13 other tributaries to feed the main channel of Cabin Branch.
14 So here we're taking some significant portion of a 295
15 million gallon rainfall event. We're pushing it through the
16 channels of Cabin Branch.

17 One of the reasons why that's important is
18 remember that sometime prior to mid-June, like over here off
19 the screen, all the beavers had been removed from that upper
20 stretch, meaning that anything that hits the ground in that
21 region is going to more readily move through the ditch system
22 into the tributaries, go into the channel, and quickly move
23 downstream. Now, before the beavers were removed, that water
24 would tend to be impounded and delayed on its velocity and
25 movement downstream. I think that's pertinent.

1 So on September the 9th, 2009, you get a phone
2 call--the state, I guess, gets a phone call--with an
3 anonymous report of some problem they've observed I believe
4 near Sheffield bridge of Beaverdam Branch. That's approxi-
5 mately nine days after this really significant rainfall
6 event. What's--you might ask, what--maybe I shouldn't put
7 words into what you would ask. But the significance of---

8 Q (interposing) What's the significance of that,
9 then?

10 A Thank you. The significance of a large rain event
11 is that overland flow after large storm events adds signifi-
12 cant non-point source nutrients to the drainage system.
13 Okay. We know this from fish kill reports that DWQ investi-
14 gates every year. Large, big rain events load up these
15 streams with nutrients. Those nutrients then lead to
16 depletion of oxygen conditions. The fish come up and get--
17 start to look like they're not happy. That's to quote Ms.
18 Willis.

19 But an example of that was this year we had
20 Hurricane Irene. I'm from Greenville, North Carolina and the
21 *Daily Reflector* had an article in the paper about the result
22 of this large rain event that occurred from Hurricane Irene
23 this year and how much non-point source nutrient load it
24 added to the Tar River.

25 We had fish floating up to the land surface on the

1 Tar River at the Town Common Park. And the newspaper article
2 attributed that to the non-point source pollution runoff from
3 a large rain event following an extended period of dry
4 weather throughout the summertime.

5 This is a similar type of thing that helps to set
6 the stage for why you see such low dissolved oxygen condi-
7 tions throughout this entire system that we've looked at
8 today, including Beaverdam Branch as well as portions of
9 Cabin Branch. A lot of the low dissolved oxygen can be
10 attributed to the delayed effect from a large nutrient
11 loading surface runoff from that type of an event.

12 Q Okay. Does that slide reveal anything else of
13 meaning to---

14 A (interposing) It also creates--that much water
15 going through that drainage system creates a dramatic short
16 term increase in velocity. When you increase velocity and
17 you increase the height of water that fills the channels,
18 then you have the opportunity to mobilize trapped floating
19 material like we saw in the ditches adjacent to Carolina
20 By-Products in my picture from 2011.

21 A large storm event will tend to flush that
22 material and all that debris out into the channel of Cabin
23 Branch and carry it quickly downstream. Now, it will work
24 its way downstream until it hits something that will make it
25 stop moving.

1 My conclusion is that there's something that
2 always exists in Cabin Branch just downstream of the House of
3 Raeford Farms facility that traps floating material. We've
4 seen that from my site visit later. The occurrence of that
5 large quarry lake will trap floating material as it works its
6 way down there. It's going to slow the velocity.

7 That thing doesn't change. That is a large
8 feature that will dramatically the ability of storm flow
9 through the Cabin Branch and its velocity. It will slow it
10 down and make it drop a significant portion of its floating
11 sediment load.

12 Q Well, if you have captured material that far
13 upstream, which is whether by removal of beaver dams or the
14 increase in flow caused by a large precipitation event--when
15 that material now untrapped and flows with the increased rain
16 event finds its way down to the area behind House of Raeford
17 Farms, what happens?

18 A Well, as it accumulates--it may not accumulate as
19 one big mass, and I think that's one of the flaws in the
20 interpretation by the Division of Water Quality about what
21 was observed. They worked on this assumption that the spill
22 must have happened really close to September the 9th and that
23 this material had been an episodic release or some inten-
24 tional discharge of a volume from House of Raeford Farms.

25 I argue that you could have a long term

1 accumulation of organic debris at that trapping point from
2 the continued releases of material from upstream areas that
3 are added to by the various rainfall events that induce new
4 floating material into the stream channel, works its way
5 downstream, hits that trapping point, and starts to build
6 back upstream from that point of trapping. This could have
7 taken days, weeks, even months to build to the position that
8 was observed on September the 10th, 2009.

9 Now, when you have time factored in with the
10 accumulation of materials, if you let this stuff sit and
11 accumulate over a period of time, if there are contributions
12 of wastewater and floating runoff materials and organics from
13 these offal operations at Carolina By-Products, these
14 materials are going to change their characteristics over time
15 as they sit and oxidize and degrade and bacteria chews on
16 them. They're going to change their color characteristics.
17 They're going to start to break down. While they do that,
18 they're going to reduce the available oxygen in the close
19 proximity to that floating material.

20 You could have somewhat higher dissolved oxygen
21 away from that floating material immediately upstream like
22 the state saw when they visited on that day. That doesn't
23 really necessarily have any reference to whether the stuff
24 came from somewhere farther upstream.

25 It could have very well come from farther upstream

1 and accumulated over a period of repeated discharges from
2 repeated violations of stormwater regulations and operations
3 of facilities--wastewater handling facilities at Duplin
4 Winery and Carolina By-Products constantly contributing to
5 conditions to downstream areas.

6 Q Could that have led to a buildup of that kind of
7 material from House of Raeford's back area back there all the
8 way to Sheffield bridge---

9 A (interposing) I believe it could. I certainly do
10 believe it could.

11 Q Did you in your visit--in that particular area
12 upstream, did you have any additional slides or pictures of
13 that area?

14 A I did. Let me find those. Just to follow up a
15 little bit, I had some photos from the earlier visit in
16 January of 2011. Let me see if I can get these to show on
17 the front of the screen here.

18 Here's conditions at the railroad trestle, the
19 headwaters of the Cabin Branch drainage system. You can see
20 at that time stagnated water conditions, some floating debris
21 here and there. Let's see if I can get this to advance. I
22 probably am going to have to go back to the other folder.
23 Here's my picture number 45.

24 (Pause.)

25 I'm sorry. Here we go. Here's some material in

1 January of 2011 near the headwaters regions of Cabin Branch
2 just downstream from the Carolina By-Products facility and
3 some of the areas adjacent to the railroad tracks. There's
4 an awful lot of algal mats, and there's this creamy yellow
5 floating substance that you can see mixed in with this. This
6 is all floating organicky looking material to me. Some of it
7 could be described to have potential sludge-like character-
8 istics.

9 Q And this was in January of this year---

10 A (interposing) January of 2011.

11 Q ---before those previous pictures were taken?

12 A That's correct, January 2011. Here's a close-up
13 view of some of that material that I saw trapped up in there.
14 Now, these type of characteristics are exhibiting in this
15 area I believe because water is being impounded and there's
16 not good effective stormwater runoff anymore, probably
17 because of renewed beaver activity that's moved back into the
18 area. Here's another view of that same material.

19 This next slide is from my trip in April of--
20 April 13th, 2011. And I recognized when I put together my
21 earlier summary of that trip along the stream that I didn't
22 have any good pictures of the quarry lake, so that people
23 could visualize what it looks like to be out there on a boat.

24 You'll see a--we have a bamboo pole right here.
25 We were having to pole our way through the channel because it

1 was--it was very shallow and there were plenty of log
2 obstructions. And we had difficulty getting that johnboat to
3 go through the channel portion. When we got to the open
4 quarry lake, the depth opened up dramatically. We were able
5 to use our trolling motor and putter across and I took time
6 to take some photos.

7 But this is approximately 350 feet across for this
8 section and there's a secondary lake in behind it. And we
9 show that we had those--here it is again, showing how large
10 this channel is now. This is now the channel of Cabin
11 Branch. You go from this narrow stream, only 20 or 30 feet
12 wide or less, to this expansive lake.

13 Q Show the Court where that is on the big overhead
14 there.

15 (Witness approaches photograph.)

16 A Yeah. The view in that picture is from right
17 about here (indicating) along the edge of the quarry lake
18 looking back toward this little peninsula that sticks out, so
19 it's looking toward this larger other quarry lake that's in
20 the background.

21 Q Thank you.

22 (Witness returns to stand.)

23 **EXAMINATION**

2:47 p.m.

24 By the Court:

25 Q Now, for clarity of the record, how did that come

1 about? You had testified that it took a sharp, man-made
2 turn---

3 A (interposing) Yes.

4 Q ---away from it---

5 A (interposing) Yes.

6 Q ---presumably when the quarry was in operation.

7 Did nature bring it back into there or did somebody else
8 build it? What are your---

9 A (interposing) I'm glad you asked the question.
10 My belief is that--typically these quarry operations will
11 divert surface water bodies away from their active pit so
12 that they're not having a stream flowing directly into their
13 pit, and they can manage that.

14 After they're done with these quarry operations,
15 oftentimes they'll knock down the dams and allow that water
16 to come in and flood their old quarries. And so I believe
17 that's what happened is that they were decommissioning that
18 quarry. When they had mined out all the available resource,
19 that's what they did.

20 I have experience working in a similar one in
21 Belgrade, North Carolina where the White Oak River passes
22 beside of the active Martin-Marietta Belgrade Quarry. And
23 there are old abandoned quarry pits from back in the I
24 believe '40s and '50s when they first started mining
25 limestone there.

1 close to the Sheffield bridge is completely choked with
2 floating material. It's predominantly duckweed and there's
3 other aquatic vegetation and there's trash. This is a good
4 proxy for the behavior of the floating sludge-like material
5 that was observed in 2009 and the way it interacted with the
6 stream channel at that time.

7 Q Are those the last of your---

8 A (interposing) I think that's the last of those
9 supplemental pictures.

10 Q Go back to---

11 A (interposing) Go back to the presentation?

12 Q Yeah.

13 (Witness complies.)

14 Q Now, Mr. Holley, based upon--you've talked about
15 the mobility of this material on Cabin Branch further
16 upstream, which becomes mobilized by removal of dams and
17 things and---

18 A (interposing) Yes.

19 Q ---precipitation events. Based upon all the
20 information you've had before you, your background,
21 experience, and education, the visit you've made to the site
22 as well as to the sites downstream and upstream, are you able
23 to reach a conclusion satisfactory to yourself about how the
24 condition on Cabin Branch behind House of Raeford that was
25 investigated--how that condition could have been contributed

1 to by people along that stream?

2 A Yes, I do.

3 Q What is that conclusion?

4 A Well, I have a series of bulleted conclusions that
5 I plan to go through. These are kind of organized
6 systematically. My first conclusion is that there were known
7 wastewater discharges into Cabin Branch in the upstream areas
8 above House of Raeford Farms' property that originated in the
9 headwaters regions. These were confirmed to exist prior to
10 and concurrent with the observed so-called sludge that was
11 investigated behind the House of Raeford Farms facility.

12 Q By the way, you've been using that term. Do you
13 know what sludge is?

14 A My understanding is that it's a wastewater term
15 that related to a product of wastewater processing,
16 specifically a wastewater term. So there's an implication if
17 you call something sludge that it originated from a
18 wastewater activity. It is typically the floating solids as
19 well as--sometimes you'll hear people use the settleable
20 solids in their terminology related to sludge, but it's kind
21 of an ill-defined term.

22 And in the regulations that I've looked at
23 associated with surface water rules and these various waste-
24 water permitting processes, the definition list doesn't have
25 a definition of sludge, yet it is present in the description

1 of the rules.

2 So there's an implication that you understand what
3 it means, but it's not specifically defined in the rules as
4 to what sludge is, not to my reading. There may be some
5 supplemental definitions that I'm unaware of, and I'll be
6 glad to share--you know, for someone to share that with me,
7 if they know.

8 Q Go ahead and proceed.

9 A "Wastewater discharges from the Carolina
10 By-Products facility included animal by-products (runoff from
11 the offal truck staging areas)." And there's evidence that
12 these have impacted Cabin Branch and that these impacts
13 included effects on the stream with low dissolved oxygen
14 where that occurred and high fecal coliform bacteria.

15 "Discharges from Duplin Winery facility included
16 wastes from the wine making process" and "These wastes
17 resulted in 'black septic wastewater with putrid odor' and
18 were associated with low dissolved oxygen conditions" in the
19 headwaters of Cabin Branch.

20 "Removal of beavers and beaver dams by the Natural
21 Resource Conservation Service prior to June 16th, 2009 would
22 have facilitated movement of...floating debris and sludge in
23 the headwaters of Cabin Branch to downstream areas."

24 "The 3 inch rainfall event that occurred on August
25 31st, 2009 would have added nutrients to the entire drainage

1 system, leading to [a] low dissolved oxygen [condition] in
2 the days that followed. This event would also have mobilized
3 sediment, floating debris, and wastewater from the headwaters
4 near Carolina By-Products and Duplin Winery to downstream
5 areas."

6 Now, I want to make sure it's understood that all
7 wastes that enter the headwaters of Cabin Branch from the two
8 upstream sources eventually drain downstream past the
9 Carolina--the House of Raeford Farm facility. They converge
10 on that section of the stream that goes into the quarry pond
11 into further downstream areas. It all comes past that
12 location. So any impacts in upstream areas eventually have
13 to go past this area that we're talking about.

14 The North Carolina Division of Water Quality and
15 EPA have not identified a discharge of wastewater or sludge
16 as a known point source from the House of Raeford Farms
17 lagoons into Cabin Branch. The assertions that the House of
18 Raeford Farms is the source of the so-called sludge and the
19 apparent conditions observed in September 2009 are entirely
20 circumstantial.

21 "The state of North Carolina charges House of
22 Raeford Farms with '...causing the depletion of oxygen in
23 Cabin Branch and Beaverdam Branch below the water quality
24 standards for Class C-S[wamp] w[aters] waters of the State.'
25 Further, the state charges House of Raeford Farms with

1 '...depositing floating solids and sludge in Cabin Branch and
2 Beaverdam Branch impairing it for its best use.'"

3 Dissolved oxygen concentrations observed in
4 September 2009 demonstrate that dissolved oxygen was
5 depleted, less than 4 milligrams per liter, on Cabin Branch
6 in areas upstream of the House of Raeford Farms facility.
7 These upstream conditions could not be related to activities
8 at the House of Raeford Farms facility.

9 Additionally, North Carolina Division of Water
10 Quality determined that depleted DO conditions occurred
11 upstream in Beaverdam Branch and in several unnamed
12 tributaries of Beaverdam Branch that are unrelated to the
13 observed so-called sludge behind the House of Raeford Farms
14 facility.

15 So the conclusion, I conclude that depleted
16 dissolved oxygen in September of 2009 was the result of a
17 combination of factors. These factors included drought
18 conditions prior to the monitoring event; stagnant stream
19 flows that occurred in proximity to the House of Raeford
20 facility; a recent heavy rainfall event on August 31st, 2009
21 and also prior large rain events earlier in August that
22 likely added nutrients from stormwater runoff; and fourth,
23 upstream discharges of wastewater from Carolina By-Products,
24 the Duplin Winery, and possibly other facilities that have
25 yet to be determined such as potential contribution from

1 leaking--or discharges from a sanitary sewer system that may
2 be in poor condition and could have had a discharge there
3 that was never investigated by the Division of Water Quality.
4 They were unaware of it, apparently unaware of it from the
5 records.

6 My conclusions are also that the North Carolina
7 Division of Water Quality has not fully characterized the
8 potential for the upstream sources of wastewater observed in
9 Cabin Branch near the House of Raeford facility. I identi-
10 fied and documented wastewater handling facilities at the
11 Magnolia Elementary School immediately upstream of the House
12 of Raeford Farms facility that were in disrepair and could be
13 a potential source of wastewater discharge in Cabin Branch.

14 And let me expand upon that, if I can. When you
15 have a sanitary sewer system, one of the problems that
16 sanitary sewer systems address all the time is this problem
17 they call I&I, which stands for influent infiltration.

18 If you don't have had a tight sewer system, if
19 there are breaches, if there are openings to the atmosphere
20 that you don't intend like broken collars around your manhole
21 covers that allow stormwater runoff to enter your system,
22 then when a big rain event happens, you get all those extra
23 water that's not generated by normal wastewater processes.
24 The system becomes overwhelmed. It exceeds the volume that
25 the treatment plant can handle, and things can back up and be

1 discharged.

2 Backups can occur in these sewer pipes like I
3 observed behind Magnolia School. If they fill up with
4 additional water beyond what they are normally capable of
5 handling, then you can have untreated sewage that will bubble
6 out of the top of the ground right there adjacent to the
7 swamps that feed into Cabin Branch. I'm not saying that that
8 happened. I'm just saying that that's a possibility that
9 should have been investigated.

10 My understanding is that in the early stages of
11 this initial investigation, the Division of Water Quality
12 thought that this material was human waste product. They
13 thought it was human sewage. And yet they don't seem to have
14 investigated potential sources of human sewage as a part of
15 their overall investigation. I find that to be lacking.
16 They should have done that.

17 Stream monitoring conducted by Environmental
18 Chemists in September of 2010 measured dissolved oxygen in
19 Cabin Branch at low concentrations similar to what was
20 observed in 2009 despite the absence of the accumulated
21 so-called sludge material in Cabin Branch.

22 Q And why do you point out that it's despite the
23 absence of sludge?

24 A Well, it's to make the point that low dissolved
25 oxygen conditions in a summertime, in September, in this

1 drainage system are going to be low as a result of a variety
2 of factors not exclusively related to the so-called sludge
3 that's being attributed to House of Raeford Farms. It's not
4 a uniquely tied effect to this stream system, and so that's
5 why I make that point.

6 Q In other words, you found lower than legal levels
7 of dissolved oxygen on Cabin Branch even where there was no
8 so-called sludge?

9 A That's correct. Steam sampling conducted by
10 Environmental Chemists in September of 2010 also documented
11 elevated fecal coliform bacteria throughout the drainage
12 system of Cabin Branch where they sampled. And that was also
13 despite, you know, the absence of the so-called sludge at
14 that time. So there are other sources of fecal coliform that
15 are feeding into the system than the floating material that
16 was characterized or investigated.

17 It's my opinion that depleted dissolved oxygen and
18 elevated fecal coliform bacteria are common in summer months
19 throughout the Cabin Branch and Beaverdam Branch drainage
20 systems. These attributes have not been demonstrated to be
21 uniquely related to the so-called sludge observed near the
22 House of Raeford Farms. I think that's a pertinent point
23 given the charges that have been placed against House of
24 Raeford Farms.

25 Cabin Branch immediately downstream of the House

1 of Raeford Farms facility exhibits features that trap
2 floating materials. These include numerous fallen trees,
3 sharp turns in the stream channel, and entry of the channel
4 into an abandoned quarry pond that results in a substantial
5 drop in flow velocity.

6 Furthermore, a logjam in Beaverdam Branch down-
7 stream of Sheffield Road traps floating materials. And these
8 features existed in September of 2009 and were trapping
9 mechanisms for the so-called sludge that accumulated near the
10 House of Raeford Farms facility.

11 It's my opinion there's no evidence to support the
12 North Carolina Division of Water Quality's claim that the
13 House of Raeford Farms is responsible for the accumulation of
14 wastewater or so-called sludge in Cabin Branch.

15 I believe it is more likely that wastes discharged
16 from the Carolina By-Products and Duplin Winery facilities
17 and possibly other upstream facilities migrated downstream
18 over a period of time, potentially weeks or even months
19 following the removal of beaver dams in the summer of 2009.
20 These wastes became trapped by a variety of obstructions and
21 changes in the stream channel that occur downstream of the
22 House of Raeford Farms facility.

23 Q And those are the references---

24 A (interposing) Those are the references that I've
25 cited throughout my presentation.

1 (Petitioner Exhibit 26 was
2 marked for identification.)

3 Mr. Jones: And Your Honor, we have a
4 compilation of his timeline, photographs, and conclusions
5 that we have marked Petitioner's Exhibit Number 26.

6 The Court: All right.

7 By Mr. Jones:

8 Q Mr. Holley, I think you've addressed just about
9 everything, but I just wanted to take the time to ask--go to
10 the--I guess there's still a notebook up there that might
11 have Petitioner's Exhibit Number 1 in there.

12 A Okay.

13 (Pause.)

14 Okay, I see that.

15 Q Do you see that?

16 A Yes.

17 Q Is that the one that's Findings and Decision and
18 Assessment?

19 A Yes, uh-huh.

20 Q Look at on page 2, paragraph E.

21 A Paragraph--I'm sorry. Could you repeat that?

22 Q Paragraph E.

23 A E, okay. Thank you.

24 Q At the top of the page it says:

25 "On September 10, 2009 dissolved oxygen was

1 measured at both Beaverdam Branch crossings: (1)
2 Sheffield Road crossing - 0.19 milligrams per
3 liter at a depth of 0.1 meters, and (2) Brooks
4 Quinn Road crossing - 0.22 milligrams per liter at
5 a depth of 0.3 meters."

6 Did you see those references---

7 A (interposing) I did.

8 Q ---in the study that---

9 A (interposing) Yes.

10 Q ---you did? Did you take this into account in
11 doing your own study and---

12 A (interposing) I did.

13 Q ---your conclusions? What was your conclusion in
14 response to this finding?

15 A Well, my conclusion was that dissolved oxygen was
16 quite low at those locations. Excuse me. I'm starting to
17 lose my voice. I've been talking for a while. The thing I
18 also concluded was that it's hard to discern what portion of
19 the depressed oxygen conditions in the vicinity of this
20 floating material are related to the floating material versus
21 the depleted oxygen from upstream areas that I also examined
22 and looked at.

23 Q So it may or may not have been related to anything
24 the House of Raeford was doing?

25 A Well, I don't think that they've proven that the

1 House of Raeford actually discharged anything. But I think
2 that--I would suggest that the floating material without a
3 doubt was consuming oxygen. It was an organic looking
4 material. It's been reported as having sludge-like
5 characteristics. I don't dispute that.

6 I dispute whether or not its source was some
7 instantaneous or short duration intentional discharge from
8 the House of Raeford Farms facility.

9 Q And look at paragraph H. It says, "The low
10 dissolved oxygen condition in Beaverdam Branch persisted
11 through September 23rd. Dissolved oxygen measurements taken
12 on September 23rd were"--and there's one for Sheffield Road
13 at .5---

14 A (interposing) Uh-huh.

15 Q ---milligrams and Brooks Quinn Road .14---

16 A (interposing) Right.

17 Q ---milligrams, and Beaverdam Branch at Highway 117
18 just north of the Parker Bark facility at .6 milligrams.

19 A Uh-huh.

20 Q Did you those notice those readings in---

21 A (interposing) I did notice those readings.

22 Q ---doing your study, and how did you respond to
23 that?

24 A Well, the Beaverdam Branch at Highway 117 is a
25 significant distance upstream from the House of Raeford Farms

1 facility. I can't come up with any way possible that that
2 could be related to anything House of Raeford Farms did.

3 And the persistence of low dissolved oxygen is
4 consistent with the persistence of low dissolved oxygen
5 observed from the inspections done, I believe, on or about
6 September 23rd or 24th, 2009 of the Duplin Winery facility.
7 There were still ongoing discharges of wastewater into the
8 headwaters of the stream that contributed to the low dis-
9 solved oxygen condition throughout this entire stretch of the
10 stream.

11 Mr. Jones: May I take just a second, Your
12 Honor?

13 The Court: Yes, you may.

14 (Pause.)

15 Mr. Jones: I think those are all the
16 questions we have.

17 The Court: Okay. Let's take a 15 minute
18 break before we have cross-examination.

19 The Reporter: Off the record. 3:07 p.m.

20 (A brief recess was taken.)

21 The Reporter: On the record. 3:24 p.m.

22 The Court: This hearing will come to
23 order. It's now 3:22 on October the 26th, 2011 and all
24 parties present when we recessed are again present. Ms.
25 LeVeaux?

1 Ms. LeVeaux: Thank you, Your Honor.

2 CROSS - EXAMINATION 3:24 p.m.

3 By Ms. LeVeaux:

4 Q Good afternoon, Mr. Holley.

5 A Good afternoon.

6 Q Mr. Holley, you were tendered as an expert in
7 hydrology. Can you tell me--and you indicated that currently
8 you work with Groundwater Management Associates, Inc.; is
9 that correct?

10 A That's correct.

11 Q So tell me, what are your day to day responsi-
12 bilities as relates to Groundwater Management Associates,
13 Inc.?

14 A Okay. I am a hydrogeologist. I work on numerous
15 projects related to groundwater and surface water issues,
16 predominantly groundwater. That's our specialty, groundwater
17 management systems. A large number of the projects I work on
18 are related to aquifer studies, regional groundwater flow
19 systems in the coastal plain, well and well field development
20 for water supply systems---

21 Q (interposing) Let me stop you with---

22 A (interposing) Okay, sure.

23 Q ---aquifer studies. Tell me what that entails.

24 A Sure. That entails working with well drillers in
25 the field, drilling holes in the ground, looking at the drill

1 cuttings to great depths, sometimes hundreds of feet, to
2 identify zones of water bearing sediments that can produce
3 usable quantities of water to a well.

4 And so I will study the occurrence of these
5 strata, these layers, in the subsurface, characterize their
6 hydraulic properties, their permeability and their storage
7 capabilities, and their ability to yield water to wells and
8 be a reliable source for drinking water supplies.

9 I also do studies that relate to how those same
10 types of aquifer, those water bearing sediments, interact
11 with pollutants and potentially would interact with waste-
12 water disposal systems for shallow groundwater regions, that
13 type of thing.

14 Q Is that for cities or municipalities or---

15 A (interposing) Cities, municipalities, private
16 industry. Sometimes individual homeowners will hire us to
17 work with them. I also work on some environmental issues
18 associated with pollutant spills like underground storage
19 type projects.

20 Q Now, what environmental entities have you worked
21 with?

22 A I've been a contract manager in the past for the
23 North Carolina Division of Waste Management's federal trust
24 fund program.

25 Q And what did you do?

1 A I was the direct contract manager and point of
2 contact for Ms. Linda Blalock with the Underground Storage
3 Tank Section. She was the contract administrator for the
4 state. She would assign projects that were orphaned under-
5 ground storage tank spill sites where the owner had either
6 died or could not be found.

7 They would hire our company to go out and investi-
8 gate the conditions and make sure the public weren't being
9 exposed to contaminants associated with these petroleum
10 spills. Some of that involved petroleum spills into surface
11 water, but usually there were drinking water threats asso-
12 ciated with those---

13 Q (interposing) With that project?

14 A It was a variety of projects. We would have had
15 as many as--during that six year period, I believe it was--it
16 might have been seven years--that I worked with Linda Blalock
17 since I've been at GMA. That contract period involved--I'm
18 sorry. Could you ask me the question again? I've lost my
19 train of---

20 Q (interposing) Well, I'm just trying to find out
21 when you worked with Linda Blalock---

22 A (interposing) Yeah. I was trying to say that
23 there were numerous projects, numerous sites that she would
24 give. I think we did as many as 58 or so individual site
25 assessments for her over that I believe seven year period of

1 the contract while I've been at GMA. The contract is not
2 current with us.

3 Q And the contract is current?

4 A It is not.

5 Q Okay. So then what was the period of the
6 contract?

7 A I'm trying to remember off the top of my head, but
8 I believe there were two separate three year contract periods
9 that we were able to renew and then an additional one year
10 extension for a total of seven years.

11 We did not win the contract when it came up for
12 renewal the next time. We lost out because our bid was a
13 little too high. And so we haven't been a contractor now for
14 I believe three years.

15 Q Three years?

16 A The past three years I haven't been working under
17 that contract in particular, no.

18 Q And did you work with any other environmental
19 group?

20 A In terms of--what do you mean?

21 Q Have you done any other environmental work?

22 A At GMA?

23 Q Yes, since you've been--I'm sorry; since you've
24 been with GMA. Correct.

25 A Since I've been with GMA? Yes. I'm actually

1 working on a project right now related to--I'm a registered
2 site manager with the Registered Environmental Consultant
3 Program of the Inactive Hazardous Sites Branch. I'm working
4 on a project right now that potentially might enter that
5 program, but we're doing it outside of the REC program. It
6 is a chlorinated solvent problem associated with a bedrock
7 aquifer.

8 Q So your previous environmental work, other than
9 what you're working on right now, is with underground storage
10 tanks?

11 A Not exclusively. I've worked on hazardous waste
12 site assessments. I've done remedial investigations and
13 feasibility studies at large industrial facilities. I've
14 done remedial removal actions.

15 I think if you look at my résumé, I believe I talk
16 about a large hazardous waste site cleanup I did of 1500 tons
17 of F-listed hazardous wastes at a facility in North
18 Wilkesboro. That may or may not be listed in detail in my
19 résumé for that. That was when I was with Applied
20 Environmental Services. And let's see; do you want me to
21 make other examples of the type of projects I've done?

22 (Ms. LeVeaux nods affirmatively.)

23 A I---

24 The Reporter: (interposing) Excuse me. You
25 nodded your head. Would you talk out loud?

1 Ms. LeVeaux: I didn't say anything.

2 The Reporter: You did this (indicating).

3 Ms. LeVeaux: I didn't say anything.

4 The Reporter: Okay. Thank you.

5 (Pause.)

6 The Witness: I'm waiting for a question.

7 By Ms. LeVeaux:

8 Q Absolutely.

9 A Okay.

10 Q You're listed as a licensed geologist in North

11 Carolina and a professional geologist in Pennsylvania.

12 What's the difference?

13 A Licensure for geologists is handled by individual

14 states. Some states don't require a license to be a geolo-

15 gist and practice as a geologist. It's a very similar

16 licensure program to professional engineering.

17 North Carolina--the term that they use for having

18 a license to practice geology in the state of North Carolina

19 is a licensed geologist. Other states will call it a

20 professional geologist. That's the term that they use for

21 their equivalent licensure. Does that answer your question?

22 Q Yes, sir, it does. I notice that your

23 professional registrations and service show licensed

24 geologist for North Carolina; Pennsylvania, professional

25 geologist; South Carolina, professional geologist; Kansas, a

1 licensed geologist; and Georgia, a registered professional
2 geologist. Were you doing work in those different states
3 or what was---

4 A (interposing) Yes.

5 Q ---the purpose for securing these state---

6 A (interposing) You can't--if a state has
7 licensure, in order to practice geology in that state you
8 need to obtain the proper licensure to be able to conduct
9 that work. And there's a certification process.

10 All of those states--I believe all the states that
11 are listed on my résumé are members of what is called the
12 ASBOG, the association of boards of licensure for geologists.
13 And they have a unified testing program that they all accept
14 for reciprocity.

15 So if you take the ASBOG national licensure test
16 and you've passed that, then you can petition for other
17 states to accept you as qualified to practice in that state.
18 And you pay fees and you give them letters of reference and
19 that type of thing, depending on what the individual state
20 requirements are. So that's how that's done.

21 Q Are there any recurrent--or continuing education
22 that you need to take to keep these certifications?

23 A Some states require continuing education. There's
24 a variety of ways that that can happen. I get credit for
25 South Carolina, for instance. They have a continuing

1 education requirement. North Carolina does not currently,
2 but it's been discussed. Pennsylvania I believe has recently
3 added a continuing education requirement. They used to not
4 have that. Kansas requires it.

5 You can--I've been getting credit for continuing
6 education for those various entities' licensure through my
7 adjunct lecture with East Carolina University. Teaching
8 class periodically gives me credit that covers my continuing
9 education, but sometimes I'll supplement that with other
10 outside classes and training that I might take.

11 Q And tell me about the North Carolina Certified
12 Well Contractor. What does that certification authorize you
13 to do?

14 A I'm certified to drill wells in the state of North
15 Carolina. I've taken the state of North Carolina's tests
16 that are required to be certified to install wells in the
17 state of North Carolina, to be a well contractor. So I can
18 actually offer to put wells in.

19 Now, I don't do that service. I don't operate a
20 drill rig is what I'm saying. I would work with a licensed
21 driller to do that. I feel like that certification gave me
22 additional understanding about the well drilling process so
23 that when I work with well drillers, I can observe their
24 practices and make sure they're doing things that ought to be
25 done properly under the law.

1 Q Tell me, what's the significance of the OSHA 40
2 hour HAZWOPER---

3 A (interposing) Uh-huh.

4 Q ---Certified and Current---

5 A (interposing) Sure.

6 Q ---eight hour refresher?

7 A Yes. In order to work on sites that involve
8 hazardous wastes, there's OSHA requirements that you be
9 properly trained to work with waste associated with hazardous
10 spill incidents or hazardous materials.

11 There's an initial training that anyone that does
12 that type of work must go through as a hazardous waste
13 operator or field operator on these sites. It's a 40 hour
14 class. It's a weeklong class that you take that gives you
15 the proper training and qualifications to be able to enter
16 upon a hazardous waste site and participate in investigation
17 and cleanup activities. And then there's an annual refresher
18 of an eight hour update class that's required for that
19 certification.

20 Q Is the---

21 A (interposing) And I keep that current.

22 Q I'm sorry.

23 A And I keep that current. Every year---

24 Q (interposing) You do have to---

25 A ---I take the eight hour refresher.

1 Q ---keep that current every year---

2 A (interposing) Uh-huh.

3 Q ---with the eight hour refresher. And it
4 indicates that you're the vice chair of the Environmental
5 Advisory Commission. Tell me about that position and your
6 duties and responsibilities.

7 A Sure. It's a volunteer position. I felt like it
8 was my civic duty to participate in my community in the city
9 of Greenville and offer my I guess talents or at least
10 experience in the environmental arena.

11 I've entered my name and I guess résumé into a
12 talent bank that the city of Greenville city council reviews.
13 People will say, "I have an interest in being a volunteer if
14 you need me to help you do something." And they appointed
15 me--the city council and the mayor voted to approve me to be
16 a member of the Environmental Advisory Commission.

17 It's simply a monthly group that meets and dis-
18 cusses pertinent environmental issues throughout the city of
19 Greenville that might affect the city's interests, and we
20 provide advice to the city council so that they can consider
21 our evaluations as they establish policy and make decisions.

22 Q And your national--your professional affiliation
23 is National Ground Water Association. Tell me about---

24 A (interposing) Uh-huh.

25 Q ---that association.

1 A The National Ground Water Association is a--it's a
2 national organization of people who are groundwater pro-
3 fessionals. They work in the field of groundwater consulting
4 predominantly, but there are also regulatory people that are
5 members.

6 It's a national organization that you can join.
7 You can fill out an application and pay a fee. And they put
8 on various training events that they will give you special
9 opportunities to take and give you reduced prices if you're a
10 member of that organization versus someone who's not a
11 member. So there are certain benefits to being a part of
12 that.

13 They put on numerous conferences across the
14 country where cutting edge groundwater related issues are
15 discussed. And I've attended some of those conferences. I
16 just went to one a couple of months ago in Vermont on
17 fractured bedrock groundwater flow. It was a National Ground
18 Water Association topic.

19 Q Now, Mr. Holley, there is a reference to
20 geologist, professional geologist, licensed geologist, and
21 the certification as a well contractor as well as your
22 professional affiliations and your OSHA HAZWOPER certifica-
23 tion. But there's no reference to a hydrogeologist, so tell
24 me, how do we leapfrog from geology to hydrogeology?

25 A Well, hydrogeology is just simply a subdiscipline

1 of geology. So if a person gets a college degree, it would
2 oftentimes be in the geological sciences or be designated as
3 a geology degree. That's what my master's degree was in.

4 I took classes in hydrogeology that are specific
5 to that discipline of the broader field of geology when I was
6 in college, and I've taken subsequent classes or short
7 courses in hydrogeology for additional training as well as
8 experience in training on the job with the various companies
9 I've worked with over the years.

10 Q So how would you, you know, in an explanation
11 differentiate geology from hydrogeology since you said
12 actually that hydrogeology is a subclassification of---

13 A (interposing) Uh-huh.

14 Q ---geology?

15 A Okay. Well, let me start broadly about geology.
16 And so the thing that's interesting to me about geology is
17 that it is an eclectic science. It applies all the different
18 science disciplines that are available. Physics, chemistry,
19 biology, meteorology, all these things come under the purview
20 of geology, of the broader topic.

21 You can--if you call yourself a geologist, that
22 can mean many things. But there are separate subdisciplines
23 that people will focus on to specialize because it's such a
24 broad field. Some people go into paleontology, which is a
25 subdiscipline of geology focused on the study of fossils,

1 which is one of my hobbies. There are oceanography where
2 people apply their geologic studies specifically to what's
3 going on in the ocean processes. Those are just a couple of
4 examples. There are many of them.

5 Now, hydrogeology is a specific subdiscipline that
6 focuses on water in a natural environment, and that's been my
7 specialty throughout my career.

8 (Pause.)

9 Q My computer just shut off. I'm sorry. You
10 mentioned that there is a lot of subclassifications of
11 geology, and you mentioned that hydrogeologists--hydrogeology
12 was one of the subclassifications. And you mentioned that in
13 your master's thesis you did take some hydrogeology courses.
14 Tell me about some of those courses, what was different about
15 those courses---

16 A (interposing) Okay.

17 Q ---as opposed to this big geologist's---

18 A (interposing) Sure.

19 Q ---degree, which covered a lot of---

20 A (interposing) Sure.

21 Q ---different areas.

22 A Sure. I took a graduate hydrogeology class under
23 Dr. Richard Spruill at East Carolina University. He is
24 actually the owner of the company I work for now, Groundwater
25 Management Associates. So I had an opportunity to come back

1 and work for my old hydrogeology professor with the career
2 I've taken now. He's widely known and well respected
3 throughout the industry and is considered an authority on
4 hydrogeology. I took that class and the associated lab for
5 that class.

6 Other classes I took related more toward rivers
7 and stream flow that were under Dr. Stan Riggs and associated
8 with surface water hydraulics and movement of water in river
9 systems, transport of sediment in river systems, coastal
10 processes and ocean interactions and these types of things of
11 the water sculpting the land surface and interacting with the
12 surface of the earth. The work with Dr. Riggs with graduate
13 level classes--I think I took two of his classes that related
14 to that type of thing.

15 I also took graduate level classes in--a graduate
16 level class; no, two--in sedimentology that deals in large
17 part with how sediments get transported by water and
18 deposited in the environment and how do you understand the
19 nature of sediment transport by rivers, streams, and other
20 water bodies as well as other features like air, wind, that
21 kind of thing.

22 Q Did you secure a degree higher than the master's
23 or is that---

24 A (interposing) When I was at East Carolina
25 University, the geology program had a master's degree that

1 was a terminal degree. They have since created the--I
2 believe Institute of Coastal Marine Resources, the ICMR--I
3 may be a little wrong on the name of that--that does have a
4 Ph.D. program that you can enter into with a concentration in
5 geology under that coastal resources Ph.D. program. I'm too
6 entrenched in my career and my family to go back to school at
7 this point and pursue that.

8 Q So with Groundwater Management Associates, you're
9 the senior hydrologist. Does that mean you also manage other
10 hydrologists?

11 A That's correct.

12 Q And so how many hydrogeologists do you supervise?

13 A Let me think about that for a minute.

14 (Pause.)

15 There are three in our office in Greenville that I
16 directly supervise. There's a separate subgroup of our
17 office in Greenville that is more environmental pollution
18 oriented. They do active site assessment work, and I do less
19 of that currently than I have done in the past.

20 I still interact with and advise those junior
21 staff members on particular environmental issues, especially
22 if they relate to something that I have higher expertise in
23 like hazardous waste investigations and groundwater flow
24 characteristics at difficult sites.

25 Q On point number--or bullet number 1, 2, 3, 4, 5,

1 there's reference to providing hydrogeologic--and I apologize
2 if I'm not pronouncing that correctly--litigation support for
3 cases involving environmental contamination in Maryland and
4 North Carolina. What case in North Carolina?

5 A What individual case in North Carolina?

6 Q Uh-huh.

7 A I've worked on two cases in North Carolina back
8 when I was working for Applied Environmental Services. It's
9 been many years ago, approximately 15 years ago or so, when I
10 worked on those cases and I couldn't tell you the names of
11 how they were cited.

12 One related to a dispute over a trust fund
13 deductible for an underground storage tank project where the
14 release incident was discovered on a particular date that was
15 very close to the date of a change in the deductible for
16 entering into the trust fund program. And so there was a
17 dispute over whether the--I think it was \$50,000 deductible
18 or \$20,000 deductible should apply. And they asked me to
19 review the information and provide some advice. And I was
20 deposed, I believe, by an assistant attorney general, someone
21 with the AG's---

22 Q (interposing) Did it go to trial?

23 A I have no idea. It was an administrative type of
24 thing. The other one was a binding arbitration hearing, and
25 I don't even know if there would be--because it was through

1 an arbiter, if there would be any detailed record related to
2 it.

3 I was deposed and then subsequently testified at a
4 binding arbitration hearing related to a petroleum spill from
5 underground storage tanks that entered a telephone vault
6 system and impacted some telephone cables and a phone vault
7 and caused some damage to the phone company's property.

8 Q Was that the Maryland case?

9 A No. That was a North Carolina case.

10 Q That's still a North---

11 A (interposing) You asked me about the North
12 Carolina cases. Those are the two that I've actually given
13 depositions on and testimony.

14 Q You also indicated that you're--you were a part-
15 time lecturer for ECU, but you're no longer?

16 A I'm teaching again for them in the spring
17 semester, right after Christmas. They've asked me to do that
18 again with--well, I won't give you any other explanation.

19 Q You've worked with--as a deputy program manager
20 with Geophex Limited.

21 A Uh-huh.

22 Q That sort of describes what you spoke to earlier,
23 does it not?

24 A At Geophex I was a--my primary focus was a three
25 year contract at the Letterkenny Army Depot. I managed a

1 large--it was a 3--over \$3 million budget to evaluate
2 chlorinated solvent groundwater contamination into a
3 limestone aquifer system that was fractured and had large
4 caves--caverns--that had developed in that complex system.
5 And it was associated with wastewater laden with chlorinated
6 solvents that was lost from the sewage system serving that
7 military base, that depot.

8 They were decommissioning that base through the
9 BRAC program and they were trying to clean up their issues so
10 they could hand the property over to the local county govern-
11 ment to redevelop.

12 Q Mr. Holley, you've referenced to selected
13 publications and presentations, and the first one listed is
14 the "Saltwater in Coastal Carolina Aquifers." Could you tell
15 me what your involvement was or what that entailed?

16 A Can you show me the date of that one? I don't
17 have my résumé in front of me.

18 Q It's 2010, October 13th through 14th of 2010.

19 (Witness peruses documents.)

20 A October 13th and 14th of 2010. Yes. We'd been
21 doing some work--can I have a copy of my résumé? Do you have
22 that? I want to make sure---

23 The Reporter: (interposing) It's Number 10.

24 The Witness: Number 10? Thank you. I
25 didn't have the reference on it.

1 A I just want to make sure I've answered accurately
2 about this presentation.

3 (Witness peruses document.)

4 Yes. I assisted Chris Foldesi, who is one of my
5 juniors that I supervisor. He's a licensed geologist working
6 on a lot of projects in South Carolina, so I coauthored that
7 presentation with Mr. Foldesi, who was the primary presenter,
8 and Dr. Spruill. This was a presentation done at the--in
9 Columbia at the Metropolitan Convention Center, the
10 *Proceedings of the 2010 South Carolina Water Resources*
11 *Conference.*

12 What it involved was a presentation of the ongoing
13 studies we've been doing of saltwater intrusion at a variety
14 of locations across the mid-Atlantic states. We have a
15 number of saltwater intrusion projects. And what that
16 means--saltwater intrusion is where salty groundwater moves
17 and migrates into areas where fresh groundwater previously
18 occupied.

19 And that can be a real problem for people drinking
20 the fresh groundwater in their wells. If saltwater moves in,
21 then the water has to be treated to remove the salt before
22 people can drink it. And this is a broad spectrum of
23 projects that we've worked on that we gave examples of. The
24 highlight project for that particular presentation was
25 ongoing work we had been doing at Hilton Head Island. We've

1 been doing that for quite a few years now.

2 Q Is that--so this what, is an annual presentation
3 that you-all make?

4 A It's an annual conference. We may not always
5 present there.

6 Q I see.

7 A We offered up an abstract and they accepted that
8 abstract. And then we gave a public presentation of some
9 ongoing work that we'd been doing. It's just a public--a
10 public presentation conference.

11 Q And was this--the next one, where you reference to
12 an alternate water source for the city of New Bern, clearly
13 is another---

14 A (interposing) Yes.

15 Q ---place, another venue.

16 A Yes.

17 Q Was that also a presentation?

18 A That was a presentation. And I copresented that
19 with Mr. Blaine Humphrey from Rivers & Associates. Rivers &
20 Associates was an engineering firm charged with designing a
21 new public water system for the city of New Bern.

22 The city of New Bern in the past has relied upon
23 deep wells flowing from the Cretaceous aquifer system, which
24 are some really some old sediments that have very high
25 quality water and have been relied upon for a long time.

1 Recently the state of North Carolina has created
2 the--has imposed the Central Coastal Plain Capacity Use Area
3 restrictions on use of the Cretaceous aquifers. They said
4 that those aquifers were being overpumped, and the over-
5 pumping of those aquifers has caused problems with sustain-
6 ability of the withdrawals.

7 So they've limited how much water can be pulled
8 from those aquifers, and they've set up a schedule for public
9 water systems to find other aquifers or other sources of
10 water that they can develop to meet their future potable
11 needs.

12 And I worked with Rivers & Associates to develop a
13 new Castle Hayne aquifer well field to supply the city of New
14 Bern for their future water needs for drinking water. It was
15 a 16-well well field that we built in that project, and we
16 presented the results of that project.

17 Q Okay. And was the riverbank infiltration evalua-
18 tion of the Roanoke River--was that another presentation as
19 well?

20 A That was. Do you want me to tell you about it?

21 Q Yeah.

22 A Okay. The city of--I'm sorry; Martin County,
23 North Carolina is also dealing with the capacity use area
24 requirements. They've relied upon the same aquifers that are
25 now being restricted for use and they have to come up with

1 alternate sources of water to replace the reductions in
2 reliance on the Cretaceous aquifer.

3 They've decided that their future source of water
4 needs to be the Roanoke River. That's the best available
5 source of water for them to meet their future demands and to
6 give them opportunity for growth.

7 And so the riverbank infiltration project that we
8 did was to look at an alternate type of water intake
9 structure that would be different than a run of the river
10 intake. And what I mean by that is your typical public water
11 system relying on surface water will have a pipe that stubs
12 out into the channel of the river and they pump directly out
13 of the river and they use the water.

14 We were exploring the potential for the river
15 gravels, the old sediments that used to be where the river
16 existed throughout the floodplain of the Roanoke River--could
17 those river gravels provide a prefilter for the water being
18 pulled out of the Roanoke River. If you could put a series
19 of wells beside of the river, pump those wells, and induce
20 river water through the aquifer system to come into your
21 wells, then you can essentially have an indirect withdrawal
22 from the river.

23 The reason why you might do that is it reduces
24 turbidity of the water. The sand and gravels of the aquifer
25 help filter the water that would normally have to be run

1 through expensive processes. So it was evaluated as an
2 alternative intake structure for that new public water system
3 that they're building, or designing right now.

4 Q And I just want to know if the 2009 presentation
5 was a presentation. You don't have to go into any detail on
6 what you did.

7 A Let me see. That was a presentation that I did
8 myself. I was asked by the AWWA to be a speaker, an expert
9 speaker, on groundwater hydrology for their Drought - Lessons
10 Learned seminar in Greensboro. And I compiled examples and
11 informations about surface water and groundwater interaction
12 and how are those impacted by a drought.

13 Q And so the writings--your thesis was a publica-
14 tion; correct?

15 A Yes.

16 Q But other than your thesis, you've not published?

17 A I don't have an extensive publication record, not
18 that you would say in journals. Most of my publications are
19 reports for clients who ask me actually to apply hydrogeology
20 on particular sites out in the real world. The one with Dr.
21 Kao, the C.M. Kao---

22 Q (interposing) Uh-huh.

23 A ---publication, that was an actual article that
24 was published in the proceedings of that conference.

25 Q In 1996?

1 A That is correct.

2 Q Thank you.

3 A Uh-huh.

4 Q Mr. Holley, you spoke to sludge-like material. Do
5 you have a definition of sludge?

6 A I think I testified earlier that the best defini-
7 tion I could find in doing some research and looking at
8 dictionaries and things like that was that there was some
9 tie-in with the term "sludge" to mean that it had--it was a
10 by-product of wastewater treatment and it involved solids
11 associated with wastewater treatment.

12 But I couldn't find it in the statutes related to
13 the things that have been cited where that term is present,
14 but not in the definition list. So I'm not sure what the
15 state's definition of the term is when they use it. That's
16 why I put it in quotes because I'm not sure exactly what
17 their definition is.

18 Q Did anyone try to explain to you sludge or what
19 the state was submitting was sludge, what the--what DENR was
20 submitting was sludge?

21 A What do you mean by did anyone---

22 Q (interposing) Well---

23 A ---try to explain it?

24 Q Okay. You referenced over and over again to
25 "That's how I understand it" or "That's how I came to

1 understand it." And I'm--so I'm trying to understand--I'm
2 trying to find out from you from whom did you get this
3 understanding.

4 A My understandings are from an assimilation of all
5 the available data to me, from my review of this case and the
6 people I've met. I can't give you a specific who type of
7 thing for that. I don't know.

8 Q Have you ever had a previous occasion to define or
9 analyze sludge or a sludge-like substance?

10 A Can I think on that for a minute?

11 Q Have you had a previous occasion to analyze sludge
12 or a sludge-like substance?

13 A Yes, I have.

14 Q And when was that and where was that?

15 A Yes. I worked on a project--I believe it was at
16 Mannington ceramic tile. The Mannington ceramic tile
17 facility involved a ceramic tile production operation that
18 had a waste stream. And the waste stream was laden with
19 solids and went to a lagoon, a sediment lagoon system. And
20 we collected samples of the settled solids out of those
21 lagoons that were classified as sludge under their wastewater
22 permit.

23 Q What did that sludge look like?

24 A It was a white, clay-rich sediment, as you would
25 expect from a manufacturing of ceramics. You know, ceramics

1 are made of clay, and so it was the dust that came off of the
2 ceramic production process that was washed down out of the
3 floor into these lagoons. And the solids that settled out of
4 that waste stream from the lagoon system was classified under
5 their permit as sludge, and we sampled that sludge.

6 Ms. LeVeaux: May I approach the witness,
7 Your Honor?

8 The Court: Yes, you may.

9 The Reporter: Will this be an exhibit or just
10 something you're---

11 Ms. LeVeaux: (interposing) It will not
12 be---

13 The Reporter: ---showing him?

14 Ms. LeVeaux: It will not be an exhibit.

15 The Reporter: Okay, thank you, but it's
16 marked?

17 Ms. LeVeaux: It's marked, but I'm not going
18 to identify it. I just want him to look at the picture. I'm
19 going to show him this.

20 (Photograph handed to witness.)

21 By Ms. LeVeaux:

22 Q And I want you to look at that substance right
23 there (indicating).

24 Ms. LeVeaux: Your Honor, I'm going to
25 retrieve the picture in a minute, or do you want me to sit

1 back down?

2 The Court: No. You can take the picture
3 back.

4 By Ms. LeVeaux:

5 Q The material that you looked at, did it look
6 like--in looking at that picture that you--have you seen that
7 picture before?

8 A I'm trying to recollect. It's dated September 15,
9 2009.

10 Q Okay.

11 A So knowing that--I'm assuming it's associated with
12 this---

13 Q (interposing) It is associated with this litiga-
14 tion.

15 A I recall seeing a picture very similar to it. I
16 believe it probably was this picture, but I can't say that
17 with certainty.

18 Q That's fine. And what would you describe the
19 nature--if you were to describe that substance--I'm not
20 talking about the more liquidy one--what would you describe--
21 how would you describe that, if you were to see it?

22 A All I can tell is that there's--I don't even know
23 where this was taken, to be honest with you. Could you tell
24 me where it was taken?

25 Q It was on the DAF unit at the---

1 A (interposing) On the DAF unit.

2 Q ---House of Raeford.

3 A Okay. That helps me put some context to it.

4 Well, there is some floating material. It looks maybe some
5 solids of some sort, as would be expected from the DAF unit.

6 It's separated material from the DAF unit.

7 Q So if you were to describe this--if you were
8 talking to someone, could you give a name to that?

9 A I would maybe use the term "skimmings" off of the
10 DAF unit. It's the waste off of the DAF unit.

11 Q But it's in the DAF unit, so what--how would you
12 describe the substance in the DAF unit?

13 A Part of the waste stream from the facility.

14 (Photograph handed to witness.)

15 Q And have you seen that picture before, Mr. Holley?

16 A This picture is dated September 11th, 2009. I
17 believe I have seen that picture.

18 Q And what would you describe--could you please
19 describe for me what you see in that picture?

20 A Well, my understanding from the context of what
21 has been described about how this photograph was taken by
22 individuals with DWQ, this is a picture of Cabin Branch on
23 2009---

24 Q (interposing) What's in Cabin---

25 A ---September the 11th.

1 Q I'm sorry; I didn't mean to interrupt you.

2 A No, it's okay.

3 Q Did you---

4 A (interposing) I'm finished.

5 Q ---finish your response?

6 A I'm finished.

7 Q Okay. And what's in Cabin Branch?

8 A In Cabin Branch it appears to have a film over top
9 of the water of accumulated material with a lot of leaves.
10 And something that looks very organic, very--decaying organic
11 matter seems to be the type of thing that I'm seeing here.
12 It's a floating substance on the surface of the water.

13 Q Can you tell the depth of that substance?

14 A No, not from this picture.

15 Q So what would distinguish a film--when I think of
16 a film, I think of something on top of something that I could
17 see the water surface. So how would you--what made you
18 define that as a film?

19 A I can't define its thickness because I wasn't
20 there. I can just say that what I see on top of the water is
21 a floating material that's covering the normal surface of the
22 water.

23 Q And it's covering bank to bank; is that---

24 A (interposing) Well, I don't see--I only see one
25 bank in the picture---

1 Q (interposing) Okay.

2 A ---but I've read testimony that it covered bank to
3 bank. And I think I've seen other pictures, if that's what
4 you're getting at, that show---

5 Q (interposing) Do you happen to know what that
6 location is?

7 A Not without looking through the records of the
8 descriptions from the state exactly where this location is,
9 no.

10 Q Could you define that substance as sludge?

11 A It you could determine that it was related to a
12 wastewater process, then you could perhaps use that defini-
13 tion. But I think you would have to first determine that it
14 is indeed related to a wastewater process to call it sludge.

15 Ms. LeVeaux: Is it okay to retrieve that?

16 The Court: Yes.

17 (Pause.)

18 Q I asked you that question, Mr. Holley, because in
19 your--and we'll get to your specific exhibits, but there was
20 a green-like substance and you said it was a sludge or
21 sludge-like material. But you couldn't determine what
22 contributed to that source. You speculated as to what
23 contributed to it.

24 So is it that you were able to call that a sludge-
25 like material, but yet I'm showing you a gray matter and

1 you're saying you couldn't make that same---

2 A (interposing) I was simply---

3 The Reporter: (interposing) I'm sorry.

4 please let her finish her question. You said you couldn't
5 make that same---

6 Ms. LeVeaux: Determination.

7 The Reporter: Thank you.

8 The Witness: Could you repeat the question?
9 I'm sorry.

10 The Court: How are you differentiating
11 between---

12 The Witness: (interposing) How am I
13 differentiating.

14 The Court: ---the green flow that you
15 characterized as sludge-like and the white film that---

16 The Witness: (interposing) I was---

17 The Court: Ms. LeVeaux showed you that
18 you---

19 The Witness: (interposing) It---

20 The Court: ---characterized as more film-
21 like?

22 The Witness: Okay. I'm sorry; I believe I
23 understand the question. If---

24 The Court: (interposing) That may not be
25 her question, but---

1 A (interposing) If I'm not mistaken, the term that
2 I used in my presentation--and if I didn't use it this way,
3 then I was mistaken; it should have been in quotes--"sludge-
4 like," I was simply drawing a correlation to the term that
5 we've been putting in quotes that describes the material in
6 the creek.

7 It's a floating material. It's of an organic
8 nature. It's got an unknown origin. But it's consistent
9 with what the state in their citations to the House of
10 Raeford Farms have called sludge. It has similar character-
11 istics from my visual observation to what was described
12 previously.

13 Q So is it your testimony, then, that that green,
14 sludge-like material that you've identified is the same or
15 similar to the material that I showed you?

16 A What I'm suggesting is that floating material of
17 that nature can have a variety of characteristics that could
18 be later described as sludge-like material at other
19 locations. That didn't come out very well.

20 My opinion is that floating material originating
21 from the headwaters of the stream close to known, identified
22 stormwater discharges from waste sources, could migrate
23 downstream and could accumulate, and over time its character-
24 istics may change. They may not be visibly the same, but
25 they could still be related. There still could be an origin

1 tied to that.

2 Q And you reference to headwaters. What are head-
3 waters?

4 A Headwaters are the upper reaches of a surface
5 water body where stream flow first begins.

6 Q And if a person were to determine the headwaters,
7 is it possible that they would look at a USGS?

8 A I believe that there are--I believe USGS does do
9 some designations of headwaters of streams. You can look at
10 USGS topographic maps and they attempt to identify blue lines
11 on their topographic maps as to whether intermittent stream
12 flow is occurring or permanent stream flow is occurring.
13 It's a designation that you look at from drainage.

14 Q And so you did look at the headwaters of Cabin
15 Branch, did you not?

16 A The accessible portions that I could get to within
17 the limitations of that portion of the Cabin Branch area,
18 yes.

19 Q So is it fair to say you didn't follow it all the
20 way up to the headwaters?

21 A Well, every--every feeder tributary that
22 contributes to the initial stream flow of Cabin Branch is a
23 headwater contributor, okay? So every ditch that has water
24 in it that is standing all the time and feeds in is a portion
25 of the headwaters. That's why that term is plural. I

1 visited some portions of the headwaters of Cabin Branch.

2 It's not a singular designation.

3 Q I just make that reference because you referenced
4 to the headwaters as being right there behind Carolina
5 By-Products, so I'm just trying to understand where you went.

6 A I was making a general statement that the surface
7 flow of Cabin Branch begins in the vicinity of Carolina
8 By-Products. At higher elevation to the west from there, you
9 no longer have a defined surface water body.

10 Q But you did observe the headwaters?

11 A I observed a portion of the headwaters.

12 Q And that was assessed as a result of either
13 walking along the railroad tracks---

14 A (interposing) Uh-huh.

15 Q ---and then you said you could glean glances
16 from--between properties?

17 A Uh-huh.

18 Q And I think you said you walked up as far as you
19 could on the--from the House of Raeford?

20 A There's multiple parts to that, but that last
21 portion of the question you asked if I walked up as far as
22 could from House of Raeford?

23 Q Right, because you referenced using a boat. And
24 then I think you said---

25 A (interposing) Correct.

1 Q ---that you--I'm sorry.

2 A I'm sorry too. Can you ask the question again?

3 Q Yes. Why don't you tell me how you got to the
4 headwaters and what you observed?

5 A Well, I had examined aerial photographs and avail-
6 able LIDAR data and topographic information that laid out the
7 nature of all the feeder streams that contribute to Cabin
8 Branch. All of those feeder streams contribute to the
9 headwaters of flow into the stream. I used that as a guide
10 for where I should drive my car to get to the uppermost
11 reaches that I could reasonably make access to from either
12 public roads or from the railroad right-of-way.

13 In terms of--I believe you asked about walking the
14 stream. I did not walk the stream specifically upstream from
15 Sheffield--I'm sorry, Brooks Quinn Road--because I would have
16 been trespassing on private property and I didn't have
17 permission to do that. So I had to make access where I could
18 obtain access to do so.

19 Q Did you attempt to get permission to walk on the
20 private property?

21 A Immediately--where, which private property?

22 Q Well, you said you couldn't get permission. From
23 whom could you not get permission?

24 A I didn't attempt to get permission from private
25 landowners. There are so many properties that that stream

1 crosses throughout its course it would have been quite a
2 labor endeavor to do that, to see every stretch of that and
3 arrange access.

4 I visited readily accessible properties that I
5 could in places where the stream was exhibited on public
6 lands and in right-of-ways. And I gained access permission
7 through the assistance of Clay Howard to visit the stream
8 behind the Magnolia School, which I've shown photographs of.

9 Q You did ask permission---

10 A (interposing) Yes.

11 Q ---from Magnolia School?

12 A Clay Howard arranged that with the vice principal,
13 I believe. And we checked in with him and they gave us
14 approval to walk on their property and get access to Cabin
15 Branch behind their facility.

16 Q And why didn't you ask permission of the other
17 private landowners?

18 A I would have trouble justifying intruding on
19 people's property. There are an awful lot of private land-
20 owners. The research involved with identifying all those
21 people and finding phone numbers is tremendous. It wasn't
22 necessary.

23 Q So you evaluated--did you evaluate the conditions
24 of the creek?

25 A In what way?

1 Q Well, that's sort of my question. In what way did
2 you evaluate the conditions of the creek?

3 A I visited the area twice, which I think I've
4 testified about, in January of 2011 and again in April of
5 2011. During those two visits, I walked certain accessible
6 sections of the stream that I took photographs of.

7 And I put a boat in on April 13th, which we've
8 talked about. And I visited Magnolia School, the creek in
9 behind there, which I've shown photographic evidence of. And
10 then I visited the railroad track area near Duplin Winery and
11 Carolina By-Products.

12 Those are the stretches of the creek that I
13 examined. My purposes were simply to visually examine the
14 conditions of flow on those streams and take some photographs
15 and see what it looks like.

16 Q From those various---

17 A (interposing) From those various locations.

18 Q ---locations. And you did this in 2011?

19 A That's correct.

20 Q Now, would it make a difference that Cabin Branch
21 had recently come from under a drought between 2007 and 2009?

22 A I'm trying to make sure I understand what you're
23 referring to would it make a difference. With regard to
24 what?

25 Q Would it make a difference as to the conditions

1 that you noted in your research which actually resulted in I
2 would think your conclusions and the opinion that you
3 rendered here today?

4 A I want to clarify. Are you asking about would it
5 have affected the flow conditions of the stream or---

6 Q (interposing) Well, I really don't want to limit
7 it to flow.

8 A Okay.

9 Q So my question is tell me if it affected any
10 conditions and what would be the conditions that it would
11 affect.

12 A Well, there are no stream gauges on Cabin Branch
13 operated by the United States Geological Survey, so there's
14 no record of how the drought period that you mentioned would
15 have affected flows on the stream throughout that time
16 period.

17 I don't have data from that time period to
18 consider, so I can't really draw conclusions about how it
19 would have impacted what I observed in 2011. I don't have
20 data to support that. I can only make conclusions based on
21 data that I have.

22 Q Okay, so you don't have any data. You didn't
23 get--I mean you couldn't get any data. In fact the only data
24 you got was the data that was given to you that we produced
25 in---

1 A (interposing) Through discovery.

2 Q ---discovery?

3 A Yes.

4 Q So the data that you got was our data.

5 A Uh-huh.

6 Q Correct?

7 A Yes.

8 Q For the most part?

9 A Yes.

10 Q And my question was--my question now is could--
11 could a drought have an effect on the data--the analysis that
12 you gave us here today and the opinion that you gave us here
13 today as it relates to that particular--as it relates to
14 Cabin Branch?

15 A During what--I want to make sure I understand what
16 time period of drought you're talking about and how it would
17 affect Cabin Branch.

18 Q What do you mean what time period?

19 A Time period of drought.

20 Q Okay, let's---

21 A (interposing) Earlier you gave a framework that I
22 think started around 2007 and extended to---

23 Q (interposing) Let me just go to 2009.

24 A Okay.

25 Q Okay. In---

1 A (interposing) Sure.

2 Q ---2009 if Cabin Branch was undergoing--or just
3 completing a drought period---

4 A (interposing) Uh-huh.

5 Q ---and you said that you compared that period to
6 2011, which they're not coming out of a drought right now, so
7 I'm just saying what differences would you expect in the
8 conditions that you determined existed in 2009, if that were
9 the situation?

10 A Well, a drought means that there is less water
11 entering the system than would be considered by people who
12 monitor this process to be normal conditions. There's some
13 baseline average I would take it that is considered to be
14 non-drought condition.

15 So when you're in a drought, then you would have
16 less water being contributed to the area due to precipitation
17 than normal. If you put less water in a drainage basin, then
18 you would have an effect of reducing the flows in that
19 drainage basin.

20 Q So if you have less water, then you have less
21 flow; correct?

22 A Yes.

23 Q And if you have less flow, then--you referenced to
24 this material coming down. There would be less impetus
25 behind whatever came down from the headwaters; correct?

1 A I don't understand that question. Can you please
2 tell me---

3 Q (interposing) Well, tell me just in your own
4 words where the sludge came from that's now been accumulated
5 behind House of Raeford behind the---

6 A (interposing) I don't know with certainty---

7 Q ---secondary lagoon.

8 A I don't know with certainty where that came from.
9 What I've observed and concluded from the details that I've
10 reviewed from available file information and from my recon-
11 naissance of the area is that there is evidence of wastewater
12 discharges that have been cited by the Division of Water
13 Quality from two locations upstream of House of Raeford
14 Farms, those being Duplin Winery and Carolina By-Products.

15 Those are known point sources of pollution to the
16 stream that contribute impact and impairment to the stream
17 and that those impairments will eventually, as they move
18 their way downstream, cross past Carolina By-Products. They
19 could certainly be contributors to the condition of what was
20 observed there.

21 There could be other unidentified sources of the
22 conditions that were observed there that haven't fully been
23 evaluated. One of those I've given an option for, which is
24 the sanitary sewer system that serves part of the area,
25 potentially could have had a breach and contributed some of

1 the conditions in the creek.

2 I don't know that that's the case, but I'm just
3 saying that that's another option that hasn't been fully
4 evaluated in the conclusions that were made by the Division
5 of Water Quality.

6 Q Okay. So do you know--are you familiar with the
7 acronym SSO?

8 A SSO; as it relates to what? I'm not sure---

9 Q (interposing) I'm just asking you if you're
10 familiar with that acronym as it relates to wastewater.
11 Sorry.

12 A To wastewater. That one is not ringing a bell at
13 this moment. It may be something I've read before, but it's
14 not something I'm real familiar with.

15 Q Okay. I'm trying to keep my train of thought.
16 Okay. Getting back to the flow and the drought, how about
17 the impacts of rainfall during a drought?

18 A Yes. Well, I think I've testified that when you
19 go through periods of drought, then you have less flushing of
20 nutrients from open agricultural land and other regions that
21 are getting a reduced regular runoff.

22 So if you're applying nutrients to the system like
23 fertilizers for farming or if other nutrients are coming into
24 the system, when you have a rainfall event following a
25 drought, those nutrients that have been sitting idle for a

1 long time get mobilized in a higher concentration than if you
2 had had more regular, even rainfall. So they can create a
3 loading, an instantaneous sort of loading, following a
4 significant rainfall event. I believe the Division of Water
5 Quality's fish kill reports pretty well document that, and
6 I've looked at some of those on their web site.

7 Q Okay. So Mr. Holley--and I don't want to put
8 words into your mouth. You gave--you came to some
9 conclusions and you said you had an opinion, but can you tell
10 me in a couple of sentences if you have an opinion as to
11 where hundreds of thousands of gallons of this sludge-like
12 material appeared behind the secondary lagoon of House of
13 Raeford?

14 A I think I've given some examples of how such an
15 accumulation could occur over a period of time resulting from
16 a variety of inputs of waste from upstream areas. I think
17 that's a plausible explanation, given any identifiable point
18 source proximal to this location.

19 I think I also testified that the hydraulics of a
20 stream flow system and the tracking abilities of the stream
21 at that location will mean that materials can accumulate for
22 a very long period of time at that position.

23 So it doesn't take hundreds--it doesn't take an
24 instantaneous spill of hundreds of thousands of gallons of
25 something over a short period of time to create what was

1 observed behind the House of Raeford Farms. It could have
2 been something that was contributed to over some period of
3 time in pulses or in minor continuous releases from other
4 places throughout the drainage system.

5 Q And if it just appears from other places, is this
6 appearance just instantaneous or would there not be a trail,
7 some sort of--something sort of leading to that production?

8 A I think that if you look at the nature of how the
9 duckweed area is distributed as a proxy for floating
10 material--duckweed starts to accumulate at trapping points,
11 and then it builds a bridge, if you will, and then continues
12 to get farther and farther upstream as more material flows
13 from upstream areas and accumulates, so you get this backing
14 up.

15 You wouldn't necessarily see a large area of
16 duckweed necessarily in a particular patch upstream from
17 there. You could possibly, conceivably see that, but you
18 wouldn't have to have that to accumulate a large area of
19 duckweed. Duckweed is a pretty good proxy for floating
20 material like this organic laden, sludge-like material that
21 was behind the House of Raeford Farms.

22 Q And so your opinion of the duckweed was just that.
23 It was your opinion; correct?

24 A I'm just presenting that as a proxy for--to show
25 how floating material behaves in Cabin Branch behind the

1 House of Raeford Farms.

2 Q But is it fair to say that if you have a stream
3 that's distressed or a stream where you know there's been
4 spills, that some of the spills--there may be also some
5 solids settling at the bottom and that bottom becoming a nest
6 or a source for that nutrient that has surfaced as--or
7 resurfaced as duckweed? Isn't that also possible?

8 A Wow. You just really confused me with that
9 question. Can you kind of walk me through that in some
10 chunks so I can answer it properly---

11 Q (interposing) Okay.

12 A ---because that was too much.

13 Q Okay. Isn't it also possible that the appearance
14 of duckweed could be the result of a previous spill where
15 there were solids or something that was discharged because,
16 mind you, you're looking at duckweed in 2011?

17 A Sure.

18 Q Isn't it possible that a previous spill where
19 there were solids could have settled to the bottom of that
20 streambed and formed a nest, if you will? And as a result of
21 that nest or that source being there, it could manifest
22 itself or resurface to the top as duckweed? Isn't that
23 possible?

24 A That was certainly not a smaller chunk for me to
25 digest. But what I was saying--I think I understand what

1 you're saying. I don't think that there's--I'm not a
2 biologist, so I don't know a whole lot about the biology of
3 duckweed. But I don't know that there's necessarily a
4 requirement that for duckweed to exist there would have to be
5 some solids present to feed the duckweed.

6 My understanding is duckweed floats on the surface
7 of the water and grows on the top of water with or without
8 some contribution of solids. There could be suspended
9 nutrients in the water that it's uptaking that are from a
10 variety of sources throughout a stream system.

11 Q But can we agree that it's a source of nutrients?

12 A Which part is a source of nutrients?

13 Q Can we agree that the duckweed would result--and
14 it has a nutrient base as its source?

15 A As I say, I'm not a biologist, but I think that
16 I've read about a correlation between a significant growth of
17 duckweed and high nutrient levels.

18 Q Are you a wastewater expert?

19 A No, I'm not.

20 Q But in effect you relied on the reports that were
21 produced by the Department of Environment and---

22 A (interposing) Yes.

23 Q ---Natural Resources? And in the most part, those
24 reports--or when you talk to different sources, you're
25 actually referencing to violations that have occurred in the

1 past, isn't that correct, violations by the Carolina
2 By-Products? You referenced to their compliance?

3 A I did reference to their compliance record based
4 upon the documents that were provided to me, yes.

5 Q And you referenced the Duplin Winery's viola-
6 tions?

7 A Yes, I did.

8 Q Is that not correct?

9 A Uh-huh.

10 Q And Linda Willis was the inspector on a lot of
11 those reports, was---

12 A (interposing) That's---

13 Q ---she not?

14 A That's according to the records, yes.

15 Q Would it surprise you to know that she was the
16 inspector on this--on this violation---

17 A (interposing) I'm---

18 Q ---as well?

19 A I'm aware of that, yes.

20 Q Did you have an occasion--you said you didn't walk
21 up to the headwaters. If on a USGS--and what's a USGS?

22 A United States geological survey.

23 Q On a United States geological survey if it showed
24 the headwaters as dot, dot, dot, dash, dash, dot, dot, dot,
25 what does that mean?

1 A I'm assume you're talking about a United States
2 Geological Survey topographic map---

3 Q (interposing) Yes, sir.

4 A ---and all that, because USGS is an agency of the
5 U.S. Government. They provide topographic maps where they
6 have delineated the elevation of the land across areas. And
7 they have a series of symbols that they've devised to convey
8 information about their map areas. The dot, dot, dot, dash,
9 dash, dash is used to designated intermittent flow. That
10 means that the stream may not necessarily flow year-round at
11 that position.

12 That intermittent flow designation is not meant to
13 be a definitive stream qualifier, I guess would be the best
14 term I could come up with at the moment, to really establish
15 stream flow characteristic stakes, on the ground, local study
16 observation.

17 So they do a regional mapping and they approximate
18 where intermittent flow would be, and that's what they use
19 that symbol for. They do some on the ground surveys and that
20 kind of thing. Periodically those maps are updated. You'll
21 see photo updates and that type of thing.

22 Q So you've indicated that it was an approximation,
23 so the best evidence is to walk it; correct?

24 A Yeah. Doing detailed stream flow studies and
25 physical, on the ground survey would best establish all of

1 the headwater regions, all of the contributors to a stream.

2 Q Would it surprise you to know that it's actually
3 right behind Carolina By-Products, right there, and that the
4 headwaters is actually more of a wetland? There's not much
5 flow at all. Would that surprise you?

6 A No. I observed that and it's in my photo
7 evidence. And much of that I believe I testified is related
8 to beaver dam activity. I showed a logjam blocking flow at
9 the railroad track are immediately downstream that was
10 impounding a large section of water.

11 This is the exact same condition that DWQ said was
12 problematic for stormwater runoff from Carolina By-Products.
13 And that's what prompted them to drain the swamp by taking
14 out beaver dams in the summer of---

15 Q (interposing) Who drained the swamp?

16 A According to the letter that I read in the record,
17 it was the Natural Resources Conservation Service on behalf
18 of Carolina By-Products.

19 Q So Carolina By-Products drained the swamp as far
20 as---

21 A (interposing) Carolina By-Products---

22 Q ---you know?

23 A What I understand from the letter I read--and I
24 testified to who that was from earlier, but I don't--I
25 believe it was a Mr. West from that agency had a letter that

1 conveyed to the Division of Water Quality that they had on
2 behalf of Carolina By-Products removed beavers and beaver
3 dams from the area of Cabin Branch between the railroad
4 tracks and Highway 117.

5 And my understanding was their intent--the
6 implication there was to facilitate better flow of stormwater
7 away from the facility because it was so impounded by beavers
8 that it was a big stagnant swamp and you couldn't get storm-
9 water to leave the area.

10 Q So what makes an intermittent stream flow?

11 A I think I've answered that, but it is that the
12 stream doesn't flow year-round at that particular location
13 where it is designated on the map.

14 Q But that's not answering my question. My question
15 is what makes an intermittent stream flow?

16 A Oh, what makes an intermittent type of flow in a
17 stream?

18 Q What makes an intermittent stream become--you said
19 it flows some of time and doesn't flow. So what makes it
20 flow---

21 A (interposing) Okay.

22 Q ---if you know?

23 A Yeah; input of new water in the system, rain
24 events.

25 Q And where would that input come from?

1 A Precipitation is the primary source of input,
2 which would be stormwater runoff. But you also can have--I
3 don't want to go into too much of a lecture, but in this part
4 of the country we have seasonality of how recharge occurs to
5 the groundwater system.

6 In the summertime, the air temperature is high.
7 Plants are growing. Evapotranspiration handles a large
8 percentage of the input of water to the system. So during
9 those time periods of high growth of plants and high tempera-
10 tures and high evaporation rates, the water table and stream
11 flow usually gets depressed because the base flow discharge
12 and the input to recharge the groundwater is reduced.

13 In the wintertime when the vegetation all dies
14 back and there's nothing--and temperatures are lower and
15 evaporation rates are lower, more of the water that hits the
16 ground in the cooler periods that are not the growing
17 season--more of that water sucks into the ground, recharges
18 the groundwater system.

19 The water table comes up, base flow discharge to
20 the stream increases, and a stream that might have been dry
21 in the summertime could then be flowing throughout the winter
22 and early spring.

23 Q Mr. Holley, you saw those two pictures I gave you.
24 Would you agree that the sludge that was in the DAF unit
25 looked a lot like the sludge that was in the creek? And I'm

1 just going to call it sludge. I know you don't agree with
2 me.

3 A That's your term. Are you trying to say that the
4 material--the picture you showed me of the DAF unit looks
5 like what was in the stream? No. The colors were completely
6 different. The DAF unit had a (inaudible)---

7 Q (interposing) Now, I wasn't talking about the DAF
8 unit. I was talking about the gray unit on the side.

9 The Reporter: I'm sorry. I didn't hear the
10 rest of your answer, "The colors were completely
11 different"---

12 A (interposing) They were completely different.
13 The color in the picture of the DAF unit had a yellow
14 appearance. The color of the material floating in the stream
15 looked very dark, brown, almost approaching a black color,
16 from what the picture looked like to me.

17 Q I'm going to show you the two pictures again.

18 Ms. LeVeaux: If I might approach the
19 witness, Your Honor?

20 The Court: Yes, you may.

21 Q And again, I'm not talking about the liquid.

22 A Yeah.

23 Q Those are the same pictures I showed you earlier.

24 A Yeah, very different colors. This is sort of an
25 orangish, pale light brown. This is a much, much darker

1 color. It has a much different appearance to me.

2 Q They don't look at all similar to you? They
3 couldn't--I mean the fact that this looks like a shaded area,
4 that isn't--they don't look alike to you?

5 A I wouldn't call them identical or anything of that
6 nature.

7 Q No, I'm just asking if they look alike.

8 A No, they don't look alike.

9 (Pause.)

10 Q Did you have an occasion to look at the--you said
11 that there were other possible sources from which these
12 hundreds of thousands of gallons of sludge appeared behind
13 the House of Raeford. And you mentioned Carolina By-Products
14 and you also mentioned Duplin Winery as two---

15 A (interposing) Uh-huh.

16 Q ---possible sources. Have you had an occasion to
17 see the waste produced by Duplin Winery?

18 A No, I have not. I have not been able to access
19 that facility. I believe I saw a black and white photograph
20 that Henry showed to me earlier today that I believe repre-
21 sented one of their lagoon facilities.

22 I've looked at their facility from an aerial
23 photograph and tried to see basically where their lagoon
24 exists, but I haven't been able to see their (inaudible)---

25 Q (interposing) Do you know what Duplin Winery

1 produces---

2 The Reporter: (interposing) I'm sorry.

3 Q ---and what kind of---

4 The Reporter: (interposing) I'm sorry,

5 ma'am. "I haven't been able to see their" what?

6 The Witness: Operations.

7 The Reporter: Thank you. Sorry.

8 Ms. LeVeaux: That's all right.

9 By Ms. LeVeaux:

10 Q Do you know what Duplin Winery produces, what they
11 do?

12 A I believe I've testified that my understanding is
13 that facility produces wine.

14 Q And do you know what kind of wastes they produce?

15 A I've read some descriptions in the record of the
16 type of waste from one of the compliance inspection reports.
17 It is by-products from the grape processing to make wine.

18 Q And do you know what kind of waste product
19 Carolina By-Products produces?

20 A I don't have details of what goes into their
21 wastewater because I don't understand their process. I
22 haven't been to the plant and been able to tour all of the
23 aspects of what they do.

24 I know that they receive products, as has been
25 talked about, from a number of sources including materials

1 produced from House of Raeford Farms. Some of that they
2 reuse to make a product that they sell. My understanding is
3 some of that is animal feed like dog food.

4 I would venture that some of that process includes
5 a waste stream, and they have a permit to operate a
6 wastewater lagoon system that seems to very similar to, at
7 least from the air photo views and the descriptions of it--
8 similar to the type of lagoon system that House of Raeford
9 Farms operates.

10 Q Now, you referenced to your understanding again.
11 Where did you get that understanding?

12 A My review of the records that have been provided
13 to me.

14 Q And do you--you mentioned products. Was there any
15 more detail when they were referencing to the product? When
16 you looked at the materials, could you determine what the
17 products were?

18 A Are you still referring to what is produced by
19 Carolina By-Products?

20 Q I am.

21 A I don't have any details about the products that
22 they produce other than I've heard a reference, probably from
23 Clay Howard's testimony, that they produce something similar
24 to dog food.

25 Q Okay. So I'm still referencing to their waste---

1 A (interposing) Oh, to their waste products?

2 Q ---waste product, and I didn't know what the
3 result--what that was the result of.

4 A Well, as I've testified, I don't know all of the
5 aspects of their process that they use in their wastewater
6 stream. I don't think that there's been necessarily a
7 citation for them for noncompliance on their wastewater
8 operations, so there's not a lot of detail about their
9 operating of their wastewater system.

10 The citations that I've seen related more to
11 transfer of offal products in trucks and some of that
12 offloading landing on the ground and then becoming entrained
13 in their stormwater runoff that then enters untreated into
14 the surface waters and the ditches that feed into the---

15 Q (interposing) And that's a---

16 A ---surface water.

17 Q ---speculative statement that you just made; is
18 that---

19 A (interposing) That's a---

20 Q ---correct?

21 A That is a statement based upon my review of the
22 inspection reports that describe what they were cited for
23 noncompliance on, which I've summarized in my testimony, that
24 they were cited for offal staging area stormwater runoff.

25 Q Okay. What's offal?

1 A Offal is the waste products from chicken produc-
2 tion in this particular instance, but it could be from any
3 animal product where it's the portion that doesn't go into
4 the food chain when food products are produced. It's the
5 entrails, the blood, the--I presume bones and feathers are
6 also considered part of the offal.

7 Q So in your research you did discern that it was
8 other animals that were taken--animal by-products as a
9 rendering operation---

10 A (interposing) I don't know what their---

11 Q ---of Carolina By-Products?

12 A I don't know what they take. The only thing that
13 I do know is that it's been testified that they receive
14 product--waste products, offal--from the House of Raeford
15 Farms facility. I don't know what else they might receive,
16 if they do receive anything else.

17 Q Do you know whether it's animal or whether it's
18 vegetable?

19 A I don't know. I just know that they receive
20 products--by-products from the Carolina--or sorry, from the
21 House of Raeford Farms facility, and they process it to make
22 products with it.

23 Q Do you know if they receive any other animals
24 other than turkeys, chickens?

25 A I don't. I think I testified that I don't know

1 what else they take.

2 Q Is it fair to say that animals, though, as opposed
3 to grapes from Duplin Winery? Is that a fair--is that your
4 understanding?

5 A Are you asking whether Carolina By-Products
6 accepts waste from Duplin Winery?

7 Q No. I'm just trying to understand your under-
8 standing. You said you analyzed every--all these documents
9 that you received.

10 A Uh-huh.

11 Q So I'm trying discern what your understanding is
12 what the waste of the--of Duplin Winery consists of and what
13 the waste of Carolina By-Products consists of because you
14 said you analyzed all this. I just want to know what you
15 looked at.

16 A Well, I've looked at the laboratory results from
17 the testing done by the Division of Water Quality that
18 represent the conditions of the testing that they've done to
19 establish what the characteristics were of the citations of
20 wastewater problems at the Duplin Winery and of the storm-
21 water problems at Carolina By-Products.

22 Q Okay. Can you agree that the waste produced by
23 Duplin Winery is different from the waste produced by
24 Carolina By-Products?

25 A Yes, I can agree with that.

1 Q And is a fair statement to say that Carolina
2 By-Products handles the offal, or animals?

3 A Okay. Yes.

4 Q And is it fair to say that Duplin Winery handles
5 vegetation?

6 A That is my understanding from reading the---

7 Q (interposing) And is it also fair to say that
8 vegetation waste when it hits the water reacts differently to
9 an animal product hitting the water? Is that a fair state-
10 ment?

11 A It depends on--I'm not quite sure what you're
12 trying to say.

13 Q I'm just asking you a question. Is it fair to say
14 that they react to the water differently?

15 A React to the water differently; well, they're
16 different products, and so undoubtedly they would interact
17 with water in a different manner.

18 Q Is it fair to say that waste from Duplin Winery
19 probably would sink because it's vegetation?

20 A I can't say whether it would or not. I've
21 seen--I'll give you an example. My wife makes homemade grape
22 juice and the grapes float in the jar. So some portion of
23 what is produced from the grape process I would think would
24 have buoyancy and could float, so---

25 Q (interposing) But as a hydrogeologist--I'm sorry.

1 A I don't know what was discharged by Duplin Winery
2 and all the various aspects of that continued waste discharge
3 that DWQ cited them with. I don't have those details.

4 Q Does the waste from Duplin Winery, the grapes, the
5 leaves, have any fats in it?

6 A I don't know. I'm not an expert in grapes and the
7 biology of vegetation of that nature.

8 Q And is it fair to say that waste with fats in it,
9 like animal waste, has a tendency to float, does it not?

10 A The portions of the waste that are lighter than
11 air--I mean lighter than water, have a lower density than
12 water, could tend to float if they were nonaqueous. And what
13 I mean by nonaqueous means that they don't have a tendency to
14 disperse into the water.

15 Animal by-products include a lot of things. For
16 instance, from humans, urine is completely miscible in water.
17 It will completely dissolve. Okay? I'm sure that all
18 varieties of fluids associated with animals will have
19 different properties. The blood would probably tend to
20 disperse in water. I'm just presuming. I'm not a biologist.
21 I don't know. But there's a portion of that waste stream
22 that would involve materials, fats and greases, that would
23 have a lower specific gravity than water, which would mean
24 they would tend to float.

25 Q Well, in fact--do you know what the purpose of the

1 D-A-F or the DAF unit is?

2 A The DAF unit is to separate out the fatty portions
3 of the waste stream that have made it out of the plant before
4 it goes into the primary lagoon is my understanding from
5 reviewing the testimony.

6 Q Well, why wouldn't they just put it all in the
7 water?

8 A In what water?

9 Q Why wouldn't they put it all in their lagoon?

10 A Why wouldn't they put it all in their lagoon? I
11 believe their process is designed to separate it out to make
12 the lagoon do what it's supposed to do.

13 Q And that--were you here when Mr. Howard was
14 testifying?

15 A Yes.

16 Q And did you hear him say that they had that hauled
17 off?

18 A Yes, but--"that" being which portion? Are you
19 talking about the material from the DAF unit?

20 Q Correct.

21 A Yes.

22 Q And did you hear him say where they take--where
23 they took that portion?

24 A I believe I heard him say that the material was
25 placed into a tanker truck and carried to Carolina

1 By-Products. A truck provided by, if I remember correctly,
2 Carolina By-Products would carry that back to the Carolina
3 By-Products facility for processing.

4 Q Mr. Holley, how do you know that the materials
5 produced from Carolina By-Products looks a lot like the
6 materials from the House of Raeford?

7 A Did I--I'm not sure if I testified that it looks
8 like the materials from the House of Raeford. I said that
9 they accept material from the House of Raeford as a part of
10 their facility operations.

11 Q Did you look at--you looked at all the pictures
12 that were provided to you, documents. Did you make any
13 comparison as a result of looking at all those pictures,
14 those documents, as to what the waste looked like?

15 A As to what the waste looked like; can you clarify
16 that question for me, please?

17 Ms. LeVeaux: Your Honor, let me stop right
18 now because it's 4:42 and I've got a lot of questions.

19 The Court: Do we have the same situation
20 that we had yesterday?

21 Ms. LeVeaux: Yes.

22 The Court: Okay.

23 Ms. LeVeaux: I'm going to go on, and I
24 have---

25 The Court: (interposing) I meant to ask

1 you that actually yesterday, or this morning. Is this a good
2 stopping place, then?

3 Ms. LeVeaux: It's 4:43 by my computer up
4 here, and we had said earlier we'd stop at 4:45.

5 The Court: Okay. And you'd probably like
6 to stop talking too. I know your voice---

7 The Witness: (interposing) My voice is
8 wearing out, yes.

9 The Court: Okay.

10 The Witness: Thank you.

11 The Court: That being the case, let's stop
12 for the day. As we've agreed and arrangements have been
13 made, we'll be in recess until 10 o'clock on Tuesday,
14 November the 29th. And I have four days set aside, the 29th,
15 30th, 1st, and 2nd, which I believe is Tuesday, Wednesday,
16 Thursday, and Friday. We're in recess till then. Thank you
17 very much.

18 (The hearing was adjourned at 4:44 p.m. to
19 reconvene at 10:00 a.m. on Tuesday, November 29th,
20 2011.)

STATE OF NORTH CAROLINA

COUNTY OF WAKE

C E R T I F I C A T E

I, Kay K. Rohde, do hereby certify that the foregoing pages 171 through 393 represent a true and accurate transcript of the proceedings held at the Office of Administrative Hearings on Wednesday, October 26, 2011.

I do further certify that the witnesses on this day of the proceedings in the above action were duly sworn or affirmed by me in my capacity as a notary public in and for the County of Wake, State of North Carolina.

I do further certify that I am not counsel for or employed by any party to this action, nor am I interested in the results of this action.

In witness whereof, I have hereunto set my hand this 27th day of November, 2011.

Kay K. Rohde, CVR-CM
Notary No. 19971050205